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RESEARCH FOR REGI COMMITTEE - ADRIATIC AND IONIAN REGION: SOCIO-ECONOMIC ANALYSIS AND ASSESSMENT OF TRANSPORT AND ENERGY LINKS

STUDY

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Regional Development

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This document was requested by the European Parliament's Committee on Regional Development.

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Abstract

This study is aimed at describing the socio-economic situation and the state of play of **energy**, **transport** and **tourism linkages** in the **Adriatic and Ionian Region**. It identifies **development gaps between EU Member States** and **non-EU countries** that participate in the European Union Strategy for the AIR. It also identifies **risks** and **opportunities** of the **EU Strategy for Adriatic-Ionian Region** and outlines the critical importance of these opportunities for the economic development of the AIR.

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LIST OF ABBREVIATIONS

AEEG	Autorità per l'Energia Elettrica e il Gas
AII	Adriatic-Ionian Initiative
AIR	Adriatic and Ionian Region
CEFTA	Central European Free Trade Agreement
CEI	Central European Initiative
EEA	European Environmental Agency
EnCT	Energy Community Treaty
ENTSO-E	European Network of Transmission System Operators - Electricity
EUSAIR	European Union Strategy for the Adriatic and Ionian Region
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GME	Gestore Mercati Energetici
GSE	Gestore Servizi Energetici
HDI	Human Development Index
HVDC	High-Voltage Direct-Current
ICZM	Integrated Coastal Zone Management
IDP	Internally displaced persons
IEA	International Energy Agency
ISTAT	Italian National Institute for Statistics
LPI	Logistics Performance Index
PCI	Project of Common Interest
PECI	Projects of Energy Community Interest
PPP	Purchasing Power Parity
RCC	Regional Cooperation Council
REGI	Committee on Regional Development
SCM	Standard Cubic Metre
SEE	South-East Europe
SEETO	South-East Europe Transport Observatory
TEN	Trans-European Network
UNWTO	United Nations World Tourism Organization
WIIW	Vienna Institute for International Economics
WTTC	World Travel and Tourism Council

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EXECUTIVE SUMMARY

The European Union Strategy for the Adriatic and Ionian Region (EUSAIR) provides an exceptional framework for energy, transport and tourism policy innovation across the region. A new approach to these policies is required to pursue more coherent, resilient and integrated development across the region, as well as between the region and the rest of Europe. EUSAIR is a platform that has already attracted a spectrum of players from governments, local institutions, civil society, commercial interests and academia; it therefore allows policy innovation and coordination with existing EU initiatives and projects that are under implementation or are being planned across the region.

EU Member States that are part of the region consistently score better than the rest of the region in Human Development Index, Global Innovation Index, and both energy efficiency and carbon intensity of GDP. Scores in the Corruption Perception Index and Economic Freedom Index, as well as competitiveness indexes, are mixed. This indicates the ongoing harmonisation process of the non-EU countries with the EU acquis and with liberalisation and market opening policies. However, non-EU countries lag behind in physical openness and in use of infrastructure for trade. Physical openness emerges as a critical obstacle to development. In this context, the effective use of existing infrastructure prevails as the most critical prerequisite for securing investment in new infrastructure.

The Adriatic and Ionian Region (AIR/Region) has been heavily affected by the global economic crisis. This is accompanied by a long-term and fundamental decline in the competitiveness of the Region's main industries; oil refining, commodities and conventional energy. However, new opportunities are emerging in the areas of renewable energy, services (container transport, tourism) and other complex strategic investments. Unfortunately, existing strategies and policies remain focused on the preservation of the status quo in the futile expectation that 'business as usual' will resume in the future.

Energy infrastructure is becoming increasingly obsolete due to changes in supply and demand patterns, growing international competition and the evolution of environmental regulations and policy. All existing oil refineries in the region are at risk of closure, with many already shut down. This will eventually result in the crude oil pipeline and terminal infrastructure becoming obsolete. All solid fuel thermal power plants in the Balkan Peninsula are at risk of closure due to obsolete technology and environmental regulations.

The previous equilibrium of precipitation and geography which created optimal conditions for the hydropower and forestry industries in the Balkan Peninsula has been lost during the last 25 years owing to conflicts and post-conflict hardship, with significant forest deterioration occurring during this period. As a consequence, the region is increasingly exposed to the risks of floods, landslides and economic losses.

Structural changes in energy supply during the period 1991-2001 (unprecedented growth of the fuel wood share in the energy mix) which persist to this day have created massive fuel poverty and poverty risks across the Balkan region. Widespread fuel poverty limits economic development potential and creates further social and political risks. The very low efficiency of district heating systems and the high cost and low security of supplies of natural gas extend the risk of fuel poverty to the urban population.

Although security of supply of natural gas is discussed at the highest political levels, the proposed remedies evolve around alternative sources of supply and additional

infrastructure. However, the existing use of gas in the Balkan area is obsolete. The most effective remedy is energy efficiency. New infrastructure may also be considered in the context of the emergence of new commercial gas demand.

Growth in container transport provides opportunities for commercial development and international trade. Energy efficiency is a prerequisite for competitive positioning in the global marketplace. Container traffic needs to increase volume and decrease unit costs. A large container hub on the Danube is required to facilitate redistribution of container traffic inland and allow for volume increases. However, factors such as lack of strategic development and lack of integration between transport modes, in particular in Belgrade, are resulting in the further deterioration of critical transport facilities.

There is a lack of intermodal integration in the Balkan area. Only Athens airport has a rail link. No single cruise port is adequately linked with railway and airport infrastructure. The Port of Belgrade is disconnected from airports, motorways and main railway lines. River navigation on the Danube is not properly integrated with river-to-sea navigation and there is minimal container turnover in that natural hub. Critical obstacles to the efficient navigation of the lower Danube have persisted since 1946, when the Danube Convention was originally signed. Furthermore, there is a lack of harmonisation with EU inland waterway regulations and no comprehensive platform to facilitate effective navigation of the Danube–Dnieper-Black Sea and Central Asia route.

The AIR is not competitive in conventional energy resources. It is exposed to problems of security of energy supply and security of transport flows. On the contrary, it is well endowed with renewable energies (geothermal, hydro, biomass, solar and wind); well beyond European per capita norms, thanks to the availability of resources and the low population density and low level of economic activity.

Consequently, the AIR emerges as an area with significant potential to contribute to European renewable energy and decarbonisation objectives. Improved use of existing hydro power, expansion of solar, wind, geothermal and hydro energy, better use of available power transmission infrastructure across the Balkan Peninsula and strategic improvements in energy efficiency could provide the rest of Europe with new decarbonisation opportunities. This should be accompanied by the decarbonisation of transport services.

This will require market integration within the Region and between the Region and the rest of Europe. Integration between Balkan and Italian power markets is critical, and will provide benefits for both sides if accompanied by true liberalisation of capacity trade. For this to accomplish its full potential, Serbia and Romania should be encouraged to open their existing interconnection at the Iron Gates on the Danube to trading in order to enable a massive increase in transit capacity over existing overhead lines in the Balkan area. 'A non-integrated power industry would be a luxury, which this part of Europe could hardly afford' (Han, 1956). The EUSAIR provides an appropriate cooperation framework to address economic risks, climate change-related challenges, and fragmentation of resources and transport infrastructure. It provides an economic development opportunity with more potential than economic groupings that separate Italy from the rest of the Region. There are complementarities and synergies that offer interesting, though unconventional, development potentials for all countries in the AIR.

INTRODUCTION

This research paper aims to describe the socio-economic situation and the state of play of energy and transport linkages in the Adriatic and Ionian Region (AIR), taking into account the pillars of the European Union Strategy for the Adriatic and Ionian Region (EUSAIR)[1]:

1. Blue Growth;
2. Connecting the Region (transport and energy networks);
3. Environmental Quality;
4. Sustainable Tourism.

The analysis covers the EUSAIR area, which includes: Albania, Bosnia and Herzegovina, Croatia, Greece, certain regions of Italy, Montenegro, Serbia and Slovenia.[2]

There are significant **differences in the availability and reliability of data** as between EU Member States and non-EU countries within the AIR. There are also significant differences in **density of economic activity and population** that imply a relatively smaller density of events over time. Italy is a far more intensive economy than the rest of the region in terms of density of population and density of economic activity while it is also the largest country in the region in terms of area. As a consequence, it is possible to indicate major trends and issues in other AIR countries, with comparatively less data in comparisons with Italy. Italy participates in the AIR through a subset of its regions, while in other cases the whole country is included. Serbia, northern Croatia and a large part of Bosnia and Herzegovina have economies that are not organically dependent on the Adriatic and Ionian Seas: geographical distance, the Dinaric mountains and a **lack of efficient connecting infrastructure** separate those areas from the coastal zone. This hinders economic growth and prevents profitable interactions that could benefit not only the AIR itself but the entire European tourism, transport and energy markets.

The Adriatic and Ionian Macro-Region

As depicted in Map 1, the Adriatic and Ionian Macro-Region comprises (all or part of) eight countries bordering the Adriatic and Ionian seas, while recent media reports[3] indicate initiative implying that the FYR of Macedonia and Kosovo are also interested in joining.

[1] COM (2014)357 of 17.6.2014
[2] See Annex 4 for a brief introduction to the administrative structure of the countries.
[3] See for example: http://www.independent.mk/articles/15895/Edi+Rama+Macedonia+and+Kosovo+Need+to+Join+Adriatic-Ionian+Strategy published 30 March 2015, at 14:40, consulted 09 July 2015

Map 1 Adriatic and Ionian Region

Source: European Commission, EUSAIR

The EUSAIR follows a series of initiatives and processes intended to enhance cooperation and coordination across borders in the area. EUSAIR builds on the **Adriatic-Ionian Initiative** (**AII**), which was founded in May 2000 at a summit held in Ancona (Italy)[4]. The AII is transnational in nature and is intended to strengthen various existing initiatives and processes such as:

- the Europe 2020 Strategy;
- territorial cohesion;
- Trans-European Networks (transport and energy);
- the Energy Community'
- the Transport Community (at the time of writing this is arranged through the South-East Europe Transport Observatory, pending signature of the Transport Community Treaty);
- disaster risk management policy;
- the Barcelona Convention for the Protection of the Marine Environment;
- the Regional Cooperation Council (including the SEE 2020 development strategy);
- the Coastal Region of the Mediterranean;
- Strategies for Adaptation to Climate Change;
- Strategies on Biodiversity.

[4] "The Adriatic-Ionic Initiative (AII) was first launched at the Ancona Conference on "Development and Security in the Adriatic and the Ionian Seas', held in Ancona on 19-20 May 2000 and attended by the Prime Ministers and Ministers of Foreign Affairs of six coastal countries (Albania, Bosnia-Herzegovina, Croatia, Greece, Italy and Slovenia). At the end of the conference, the Ministers of Foreign Affairs present adopted, in the presence of the Commission President, the document known as the 'Ancona Declaration', affirming the importance of regional cooperation as a tool for fostering the economic and political stability necessary for European integration. The original six members were joined by Serbia-Montenegro in 2002. After the union of those two countries was dissolved in 2006, both kept their membership in the Initiative as separate countries. Its membership thus now stands at eight.
Source: http://www.esteri.it/mae/en/politica_estera/aree_geografiche/europa/ooii/iai.html - webpage, consulted April 2015.

The **Adriatic-Ionian EuroRegion** is another form of cooperation in the area; it is an association of sub-governmental territorial organisations (regions) that support EUSAIR. Its membership is shown in Map 2.

Map 2: Adriatic-Ionian EuroRegion members

Source : www.adriaticionianeuroregion.eu

The territories of these regions comprise over 200 000 square kilometres in total, with about 20 million inhabitants. However, Serbia and Slovenia are not represented in this association, despite being members of AII.

AII is associated with the **AII Parliamentary Dimension** (PD)[5], which was established in April 2001 and, at the time of writing, is in the process of institutionalisation through regular conferences and events.

There are a number of institutions and initiatives of regional importance, including **EUSAIR**, **Regional Cooperation Council** (RCC), **Central European Initiative** (CEI) and the **Central European Free Trade Agreement** (CEFTA), which are congruent with the South-East Europe transnational cooperation programme[6] and the **Treaty establishing the Energy Community**. The **North Adriatic Ports Association** (NAPA) (including the ports of Rijeka, Venice, Trieste and Koper) is a major commercial grouping intended to support growth in international transport through the ports concerned.

In the South-Eastern Europe integration process, various bodies (RCC, CEFTA, the Energy Community, etc.) have taken over initiatives developed within the Stability Pact for South East Europe. The process of institutionalisation has included formal initiatives such as the

[5] http://www.aii-ps.org/index.php/activities/parliamentary-dimension
[6] http://www.southeast-europe.net/en/

Athens Process in the energy sector, which is now an integral part of the Energy Community Treaty (a strong international agreement that is now spreading beyond South-Eastern Europe to Moldova and Ukraine).

As regards relevant specific sources of EU support in the area, cross-border cooperation has been supported, for example in the context of the Adriatic Cross-Border-Cooperation programme (under the Instrument for Pre-accession Assistance), which was available for AIR coastal regions during 2007-2013.[7] Support for territorial cooperation in the AIR will continue to be available during the 2014-2020 programming period of European cohesion policy. Examples include the Adriatic–Ionian Programme[8]for transnational cooperation, and several cross-border cooperation programmes.

Relevant EU resources and documents

Key documents relevant for the Adriatic-Ionian Region are:

- **EUSAIR**, coordinating a number of regional EU programmes and projects as well as complex linkages with other EU strategies and initiatives such as the Danube Strategy;
- **the South East Europe 2020 Development Strategy[9]**, coordinating a number of programmes and projects ongoing in South East Europe;
- **the Maritime Strategy for the Adriatic-Ionian Seas,** adopted by the Commission on 30 November 2012 (COM(2012)713).

It should be taken into account that the incomplete integration of South-East Europe (the Western Balkans) into the EU causes additional costs and development challenges for countries in the AIR in terms of:

- Incomplete integration of energy markets´;
- Incomplete integration of the transport and tourism area;
- Inadequate implementation of water legislation;
- Donor coordination; and
- Climate change and environmental risks, including loss of biodiversity.

[7] http://www.adriaticipacbc.org/download/PROGRAMME_DOCUMENTS/IPA_OP_amended_20112013.pdf
[8] http://www.southeast-europe.net/en/about_see/adriaticionianprogramme/
[9] http://www.rcc.int/pages/62/south-east-europe-2020-strategy

Box: Basic Physical Data[10]

'The North-east coast of the Adriatic-Ionian Sea is indented with many islands, bays and peninsulas. The territory of Croatia comprises 1185 islands (67 inhabited) that makes it second largest archipelago in Mediterranean after Greece. Greek Ionian Islands comprise 12 islands with 2200 square kilometres.'

For more details see:
http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/case_study_adriatic_sea_en.pdf

'Adriatic Sea, Italian Mare Adriatico, Bosnian, Croatian, and Montenegrin Jadransko More, Albanian Deti i Adriatikut is the arm of the Mediterranean Sea lying between the Italian and Balkan peninsulas. The Strait of Otranto at its southeasterly limit links it with the Ionian Sea. It is about 500 miles (800 km) long with an average width of 100 miles, a maximum depth of 4,035 feet (1,324 metres), and an area of 50,590 sq mi (131,050 sq km). The Adriatic has been of great importance in the historical development of Mediterranean Europe and is of considerable scientific interest in itself. Modern study of the Adriatic has been carried out mainly under the auspices of several Italian and Balkan scientific institutes.

There is a striking contrast between its two shores. The Italian coast is relatively straight and continuous, having no islands, whereas the Croatian coast is full of both large and small islands, generally oblong in shape and running parallel to the continental shore. Many tortuous straits form inlets between the islands similar to those of the Norwegian fjords and make the coastline very intricate.

The depths of the Adriatic near its shores bear a close relationship to the physiography of the adjacent coasts. Wherever such coasts are high and mountainous, the nearby sea depths are considerable, as in the case of the Istrian and Dalmatian areas of Slovenia and Croatia. Where low and sandy shores are found, the nearby sea is shallow, as in the vicinity of Venice or, farther south, near the delta of the Italian Po River. Generally speaking, the waters are shallow all along the Italian coast. The site of maximum depth of the Adriatic Sea is situated south of the central area; average depth is 1,457 feet (444 metres).'

Source: http://www.britannica.com/EBchecked/topic/6550/Adriatic-Sea

'Ionian Sea, Latin *Mare Ionium*, Italian *Mare Ionio*, part of the Mediterranean Sea, lying between Greece (east), Sicily (southwest), and Italy (west and northwest). Though considered by ancient authors to be part of the Adriatic Sea, the Ionian Sea is now seen as a separate body of water. In the Ionian Sea, south of Greece, the Mediterranean reaches its greatest depth (16,000 feet [4,900 m]).

The Ionian is connected with the Tyrrhenian Sea by the Strait of Messina and with the Adriatic Sea by the Strait of Otranto. The Ionian Sea includes the gulfs of Squillace and Taranto (Italy) and Arta, Patras, and Corinth (Greece). The main Ionian ports are Syracuse and Catania (Sicily), Taranto (Italy), Kérkira (Ionian Islands), and Pátrai (Greece). The Ionian Islands lie off the western coast of Greece.'

Source: http://www.britannica.com/EBchecked/topic/292915/Ionian-Sea

'The distance from Catania to Zakynthos Island is 496 km (308 mi), and from the southern tip of the Salento Peninsula to Corfu Town is 129 km (80 mi).'

Source: http://www.worldatlas.com/aatlas/infopage/ioniansea.htm

[10] These physical data are derived from various sources**,** as a single data set on the Adriatic-Ionian Region has not been identified in the desktop research.

1. SOCIO-ECONOMIC ANALYSIS

KEY FINDINGS

- The demographic decline in the AIR is the result of a natural decrease in population, aging and migration. Migration has also contributed to a loss of skills. Migration to urban centres is increasingly focused on capital cities that offer non-commercial employment and access to services.
- Among the countries covered by the EUSAIR, those which are EU Member States score much better in Human Development Index than non-EU countries. That seems to be explained by better energy efficiency and access to credit, as well as better access to international markets through better transport infrastructure.
- Economic crisis is only one aspect of a set of complex economic and social problems. Loss of competitiveness in key natural resource-based and energy-intensive industries (oil refining, commodities, petrochemicals, etc.) is critical. The position will not change without massive restructuring in the AIR toward new commercial opportunities.
- Fuel poverty is a critical determinant of social situation in many of the EUSAIR countries. Environmental impacts of energy and transport patterns increase the risk of poverty through impacts on human health and the increased probability of natural disasters such as flooding.
- Probability of natural disasters is increased by the natural resource governance regime and human activity in forestry and energy production.
- The AIR is not receiving adequate foreign assistance to allow it to respond to the challenges it is facing. Assistance is not adequately tied to policy and physical achievements. There is a significant opportunity to improve the effectiveness and targeting of aid.
- The current social situation in the Balkan area increases the risk of conflicts and political turmoil. This situation will be exacerbated by a lack of development within the AIR.

The AIR is an exceptionally diverse area in terms of biodiversity, geography, culture, economic development, EU integration and many other aspects, as demonstrated by various indicators throughout this paper. **Among countries covered by the EUSAIR, those which are EU Member States have a significantly higher Human Development Index (HDI)** (over 0.81) **than those outside the EU** (below 0.79); moreover, it is interesting to notice similar differences in the evolution of the index in the last 13 years.

Table 1: Human Development Index (HDI)

	ALBANIA	BOSNIA AND HERZEGOVINA	CROATIA	GREECE	ITALY	MONTENEGRO	SERBIA	SLOVENIA
HDI 2013	0.716	0.731	0.812	0.853	0.872	0.789	0.745	0.874
HDI Annual Growth 2000-2013 (%)	0.69	N.A.	0.64	0.51	0.43	N.A.	0.34	0.48

Source: UNDP (2014)

It seems that this difference cannot be entirely explained by the different configurations in the **Index of Economic Freedom**. It is normally expected that countries with more economic freedom will have more economic growth, which in turn will lead to a better HDI performance. However, this expectation is not proven in the AIR. In the wake of the recent economic crisis, AIR countries have shown varying results in terms of the Index of Economic Freedom: earlier years have seen a certain degree of deterioration in economic freedom ranking. **It seems that HDI achievements are more correlated with the physical openness of national economies than with legislative and nominal factors**; this is in line with the economic theory that emphasises the importance of real, physical economic openness and access to the open sea for economic development[11].

Table 2: Other Relevant Indexes

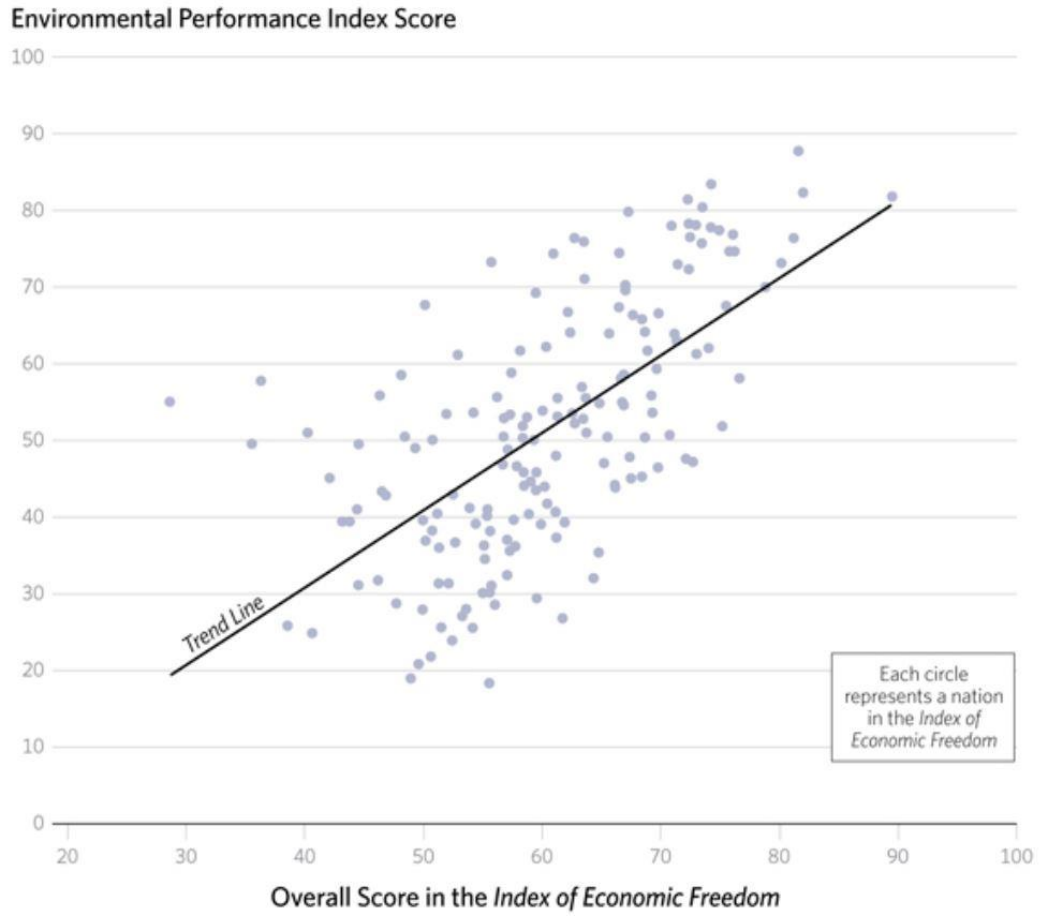
	ALBANIA	BOSNIA AND HERZEGOVINA	CROATIA	GREECE	ITALY	MONTENEGRO	SERBIA	SLOVENIA
Economic Freedom score	65.7	59.0	61.5	54.0	61.7	64.7	60.0	60.3
Rule of Law								
Property Rights	30.0	20.0	40.0	40.0	55.0	40.0	54.0	60.0
Freedom from Corruption	31.0	42.0	48.0	40.0	43.0	44.0	42.0	57.0
Government Size								
Fiscal Freedom	87.2	82.9	74.9	64.2	54.2	92.6	82.4	58.1
Government Spending	76.1	27.3	46.5	0.0	23.2	36.7	27.1	0.0
Regulatory Efficiency								
Business Freedom	70.6	53.5	55.8	73.3	71.9	77.1	57.8	81.2
Labour Freedom	52.9	63.4	42.8	51.6	55.4	77.5	70.4	57.1
Monetary Freedom	80.8	84.0	80.0	77.8	81.2	70.7	72.2	81.3
Open Markets								
Trade Freedom	87.8	87.2	87.2	83.0	88.0	84.8	78.2	88.0
Investment Freedom	70.0	70.0	80.0	60.0	85.0	65.0	75.0	70.0
Financial Freedom	70.0	60.0	60.0	50.0	60.0	50.0	50.0	50.0

Source: Index of Economic Freedom, Heritage.org (2014-2015)

The Index of Economic Freedom, as shown in Figure 1 below, is well correlated with the environmental performance of countries. Regulation and its enforcement are critical when it comes to the control of environmental impacts. This is of significant importance for countries that are dependent on biodiversity for economic development and are exposed to climate change impacts.

[11] Section 2 on transport reveals significant differences between countries in the region in terms of both in volumes and effectiveness of waterborne trade.

Figure 1: Index of Economic Freedom in relation with the Environmental Performance



Source: Terry Miller and Anthony B. Kim, 2015 Index of Economic Freedom (Washington, D.C.: The Heritage Foundation and Dow Jones & Company, Inc., 2015). http://www.heritage.org/index, and Yale University, Environmental Performance Index. http://www.heritage.org/index/book/chapter-5 (accessed 6 October 2014)

The global economic crisis since 2008 is not the only factor affecting the AIR countries. They are also affected by significant shifts in the physical realities of international competition, including but not limited to the following:

- The increased transit capacity of the Suez Canal facilitates much stronger competition from the Far East and Middle East affecting the Mediterranean and AIR. This increased competition affects process industries (aluminium, copper, oil refining, petrochemical, fertilisers).
- Strengthened environmental standards decrease scope for economic lignite extraction.
- Devastation of forest resources reaches a point when lack of forest cover increases the probability of floods, erosion and other adverse events.
- Greater economies of scale for container transport, lower transport costs and greater international competition occur in conjunction with the increasing physical openness of AIR economies.
- Lack of inland intermodal transport in the Balkan peninsula limits the export potential of local agriculture and transit opportunities towards central Europe.

These aspects are also applicable to Greece, which has been the country most affected by the financial crisis. It can be argued that in addition to being severely influenced by the negative effects of the financial crisis, Greece is also facing the more persistent and long-term physical pressures outlined above.

EUSAIR could be considered, in this context, as a framework for addressing the technical and physical obstacles to economic development in the AIR.

Finally, EU Member States consistently score better in the **Global Innovation Index** analyses, even though the **Corruption Perception Index** seems to be consistent across the AIR (with the exception of Slovenia).

Table 3: Combined indicators of socio-economic development

	ALBANIA	BOSNIA AND HERZEGOVINA	CROATIA	GREECE	ITALY	MONTENEGRO	SERBIA	SLOVENIA
Corruption Perception Index*								
Indexes	33	39	48	43	43	42	41	58
Global Competitiveness Index**								
GCI Rank 2014-2015	97	N.A.	77	81	49	67	94	70
GCI Score 2014-2015	3.8	N.A.	4.1	4.0	4.4	4.2	3.9	4.2
Global Innovation Index (out of 143)***								
GII Score 2014	30.5	32.4	40.7	38.9	46.7	37.0	35.9	47.2
GII Rank 2014	94	81	42	50	31	59	67	28
Innovation Output Sub-Index***								
Score 2014	20.4	25.5	36.4	32.0	40.1	28.4	31.7	41.4
Rank 2014	117	92	40	58	33	74	59	31
Innovation Input Sub-Index***								
Score 2014	40.4	39.4	45.1	45.9	51.2	45.6	40.1	53.1
Rank 2014	71	82	50	44	32	46	74	28
Innovation Efficiency Ratio***								
Score 2014	0.5	0.6	0.8	0.7	0.8	0.6	0.8	0.8
Rank 2014	131	101	36	85	52	44	46	53
UNCTAD Liner Shipping Connectivity Index****								
Indexes 2013	4.43	N.A.	20.44	45.35	67.26	2.35	N.A.	20.82
Containerised port traffic****								
Indexes 2011	112	N.A.	105	44	15	N.A.	N.A.	73

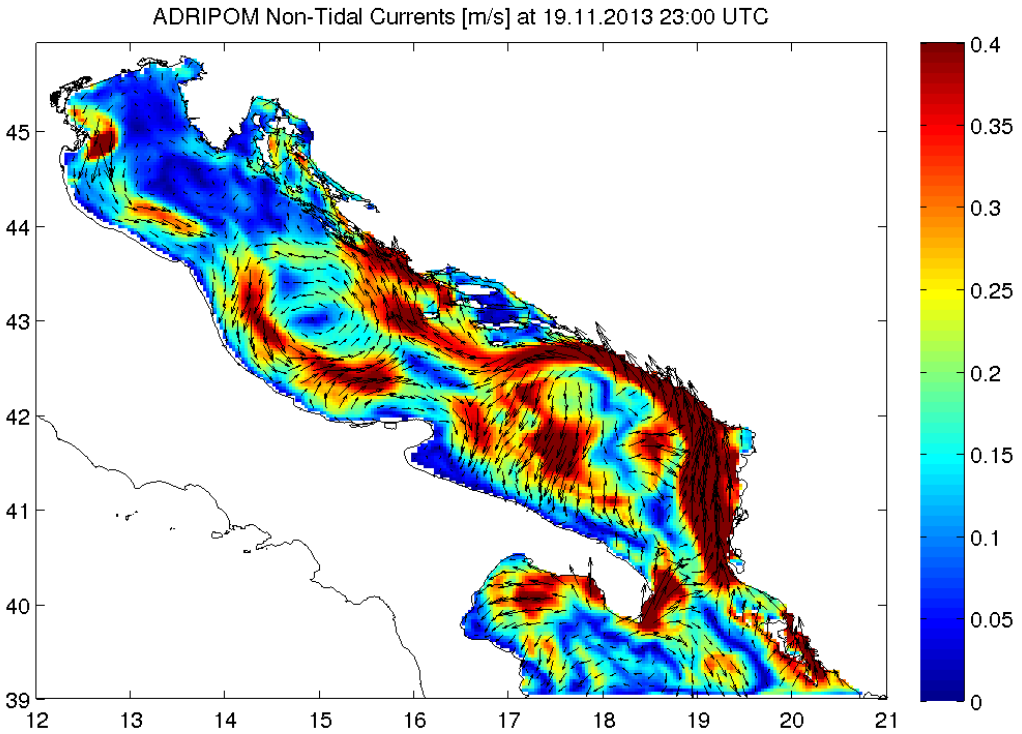
Sources: * Transparency International, ** World Economic Forum, *** Global Innovation Index, **** UNCTAD

1.1. Environment

The environmental vulnerability of the AIR is very high due to its geomorphological characteristics (lack of bathymetry and slow exchange of water; lower inflow of fresh water compared to other basins in the Mediterranean), **which make the whole ecosystem particularly sensitive.** Current and future trends lead to **the intensification of pressure on the coast**: maritime transport, urbanisation of the coastline, beach tourism and intensive agriculture and fisheries. All these, while contributing to economic growth and job creation in the area, create environmental pressures and risks. Adequate harmonisation between economic activities and environmental protection needs to be included in a clear operational and legislative framework enabling the **sustainable growth** of the Adriatic area. Generally speaking, the Adriatic Sea represents an extraordinary environmental ecosystem, as an enormous 'closed sea' where a possible accident such as dumping of pollutants would cause a critical

scenario. Landscape and environmental differences between the two coasts of the Adriatic basin are important in terms of geomorphological characteristics, the high rate of urban development and the demographic differences.

Figure 2: Key currents in the Adriatic Sea



Source: Non-tidal circulation in the Adriatic as calculated by the ADRIPOM ocean model (initialised and laterally forced by MyOcean2 Mediterranean model's circulation).
http://marine.copernicus.eu/web/89-downstream-use-cases.php?item=1595

The Italian side of the Adriatic Sea reflects well the high degree of urbanisation that has taken place along a homogeneous coastline, with peak maximum concentration of population around industrial production areas and areas of intense tourist exploitation. Excessive pressure from productive uses of land and resources, the strong anthropic pressure on the Italian Adriatic coasts, increasing maritime traffic, the particular geomorphological conditions and the slow exchange of waters have resulted in a high level of congestion and a steady reduction of natural areas, exposing this delicate ecosystem to a high risk of environmental crisis due to eutrophication, coastal erosion and pollution caused by maritime traffic. For a number of years the Adriatic has been one of the Italian seas that have suffered most from eutrophication.

The issues of environment and climate change are shown in Table 4. **In the context of protection of human health from environmental impacts and protection of the environment Slovenia, Italy and Greece outperform other countries in the AIR. The poor performers (Bosnia and Herzegovina and Montenegro) also demonstrate minimal improvement over a 10-year period.**

Table 4: Environmental Performance Index[12]

	ALBANIA	BOSNIA AND HERZEGOVINA	CROATIA	GREECE	ITALY	MONTENEGRO	SERBIA	SLOVENIA
2014 Rank	67	107	45	23	22	62	31	15
2014 Score	54.73	45.79	62.23	73.28	74.36	55.52	69.13	76.43
10 year % change	11.79	4.4	6.34	6.2	2.72	1.41	2.99	15.16

Source: Yale University (2014)

Within the EU **Adriatic IPA 2007-2013** cross-border cooperation programme, the project known as **SHAPE** (Shaping an Holistic Approach to Protect the Adriatic Environment between coast and sea; www.shape-ipaproject.eu) has recently addressed the environmental and socio-economic issues related to the integrated management of natural resources, risk prevention and conflict resolution among uses and users of the Adriatic coast and sea, through the effective implementation of the **Integrated Coastal Zone Management** (ICZM) protocol and the definition of a roadmap for Maritime Spatial Planning. The Adriatic macro-region is an ideal framework for the implementation of ICZM as a new policy aimed at the creation of a multi-level governance model, which is halfway between those of the EU and the Member States and which engages regions, local authorities and the various social and economic stakeholders more actively.

There are major differences between Italy and the Balkan peninsula: Italy is a Mediterranean country also comprising a large area in the Alps; Slovenia comprises Mediterranean, Alpine and continental Central European climate; Croatia, Bosnia and Herzegovina and Montenegro, as well as Albania, have coastal areas with a typical Mediterranean climate and the Dinaric Alps with a mountain climate; northern Croatia, northern Bosnia and Herzegovina and Serbia cover an area between the Dinaric Alps and the Pannonian plane. Greece is an entirely Mediterranean country, with extensive territorial waters and numerous islands.

Water flows are divided between the Danube catchment area and the Adriatic (Slovenia, Croatia, Bosnia and Herzegovina, Montenegro) and the Ionian and Aegean areas (Greece, Albania). The water regime originating in the Alps (the Danube and Sava rivers, northern Italy), primarily relates to snow melt and has relatively steady flows. This differs significantly from the flooding water regime related to massive precipitations that develop when moist Mediterranean air hits the Dinaric Alps along the eastern coast of the Adriatic-Ionian area: these geographic and climatic differences facilitate trade in energy, services, industrial goods, agriculture and forestry.

1.2. Social analysis

There is an ongoing **demographic decline in most of the countries characterised by continuous migration from rural to urban areas.** Forced migrations arising during past period of conflicts have mostly given way gradually to migrations motivated by economic factors: most of these occur within the same country or as a departure from the AIR towards Western Europe. On the one hand, all capital cities in the AIR are experiencing population growth that creates pressure on infrastructure and housing markets; on the other hand, real estate markets further away from coastal zones (and mountain resorts) and from urban areas are exhibiting a downward trend.

According to the Italian National Institute for Statistics (ISTAT, March 2015), by the end of November 2014 Italy had about 60.79 million inhabitants (+5.72 % in 10 years; about 48.37 % males), of whom about 37.48 million inhabit the Adriatic and Ionian area regions.

[12] "The Environmental Performance Index (EPI) ranks how well countries perform on high-priority environmental issues in two broad policy areas: protection of human health from environmental harm and protection of ecosystems." More details are available at: http://epi.yale.edu/

Medium-long term demographic dynamics in the Italian Adriatic Regions show more weaknesses than strengths:

- negative dynamics in terms of natural growth;
- high aging indicators, which implies that the indigenous labour force may have a limited capacity to satisfy labour market requirements, thus favouring immigration.

Population in Italy has remained stable over time; however, this is due more to migration flows than to the fertility rate. A decisive role is played by both inward and outward migration, compensating for the negative natural growth rate recorded in many of the Italian provinces. The demographic structure shows a marked tendency to higher values relative to the ageing index[13], which in the Italian provinces, according to ISTAT, by the end of 2013 reached the value of 146 %, the highest value for the whole Adriatic region, while the average EU rate was 111.3 % in 2010.

The countries of the Balkan peninsula have been heavily affected by the economic crisis of 2008, which has aggravated endemic economic and social problems. In addition, **the countries of former Yugoslavia are still emerging from a decade of wars and conflicts.** Major problems affecting refugees and internally displaced persons (IDPs) are still not resolved. Unemployment and the share of the informal economy are on the rise across these countries.

Average population density varies greatly among the Eastern Adriatic countries: the highest value is that for Albania (>100 inhabitants/km²), while the lowest values are to be found in Serbia (92 inhabitants/km²), Greece (81 inhabitants/km²), Bosnia and Herzegovina (75 inhabitants/km²), Croatia (78 inhabitants/km²) and Montenegro (45 inhabitants/km²). Appreciable differences in population density can be found in several countries: values far below the average are recorded in particular in the municipality of Cetinje in Montenegro (20 inhabitants/km²) and in the county of Licko-Seniska in Croatia (10 inhabitants/km²).

Albania is the European country with the youngest population: according to 2001 census data, 34.1 % of the population was below 14 years old and only 8.6 % was aged over 60 . Nevertheless, the intense migration flows, particularly to Italy and Germany, constantly reduce the young working-age population. Longevity has an impact on life expectancy at birth: there are Italian and Greek provinces where it is around 6-7 years higher than in the countries with the lowest values (Albania, Serbia and Montenegro) in the AIR.

Table 5: Population ageing and dependency ratios in the AIR

	Population median age, 2009 (years)	Projected Population median age, 2030 (years)	Old-age dependency ratio 65+/15/64,2009 (%)	Projected Old-age dependency ratio 65+/15/64, 2030 (%)
Albania	29.8	39.9	14.1	26.2
Bosnia and Herzegovina	-	-	-	-
Croatia	41.1	45.1	25.7	36.6
Greece	41.4	47.8	27.9	39.2
Italy	42.8	49.3	30.6	43.0
Montenegro	35.4	41.7	19.1	29.6
Serbia	41.3	45.2	25.4	35.1
Slovenia	41.2	47.6	23.6	40.8
EU -27	40.6	45.3	25.7	38.7

Source: http://www.oeaw.ac.at/vid/datasheet/download/European_Demographic_Data_Sheet_2010.pdf

The population trend is one of **demographic decline, accompanied by a very strong trend towards urbanisation:** population growth particularly impacts capital cities. In most cases, the urbanisation trend is motivated not by commercial economic opportunities

[13] The ageing index is a composite demographic ratio, defined as the percentage between the old age population (over 65) and the young population (under 15). It is one of the several demographic indicators (e.g. old age dependency index, average age, turnover index) that can be used to measure the rate at which a population ages.

but by government-related employment and opportunities dependent on density of population. While rural areas are becoming depopulated, capital city urban areas face problems such as lack of infrastructure, insufficient capacity of basic services and insufficient supplies of necessities (food, energy). Consequently, the **growth of urban centres is a driving force for major import activities** (e.g. of passenger cars, fuel and food) that contribute to foreign trade deficits thanks to lower indigenous production in urban areas and limited access to credit.

The most recent surveys[14] indicate **relatively stable rates of poverty and deep poverty over time,** suggesting that countries are still able to provide a minimal social safety net, including schooling, welfare assistance, social housing, refuge assistance, soup kitchens, healthcare, etc. The major causes of death have changed in recent years, with a shift from communicable diseases to cardiovascular and other non-infectious diseases. There were major improvements in the child mortality rate over the period 1954-1974 in former Yugoslavia. These improvements are now being extended to marginalised social groups including Roma. Relatively lower human development is very much dependent on life expectancy, which is in turn affected by housing and non-communicable diseases. Death arising from accidents is still significant (factors here include traffic accidents, inadequate housing, natural disasters, violence and crime).

Unemployment and housing are critical concerns that cause very high poverty risks. While poverty is to some extent under control, the risk of poverty is growing. A large part - well over 50 % - of the population is exposed to energy poverty by international standards. These families are only able to ensure (in many cases inadequate) space heating and other energy services (cooking, hot water) by the relinquishment of other vital services or food. Recent incidences of infectious disease indicate a decreasing level of hygiene and falling hot water consumption for a significant proportion of the population.

The collapse of pension and retirement funds, as well as a decrease in employment and reduction in average salaries during the previous 25 years, has shifted the burden of regular pension payout to public budgets. As a result, the poverty risk for retirees has increased significantly. Overall, **indices of inequality are worsening** and vertical social mobility is depressed. There is a **significant drain of skills toward European and international markets**. This is now starting to negatively impact critical services such as healthcare and education.

1.3. Economic analysis

The evolution of Gross Domestic Product (GDP) in the AIR in recent years has resulted in general in an increasing divergence of the AIR from EU-28 average GDP per capita, despite the decreasing population. GDP data in Annex 1 demonstrate the decline of GDP versus minimal GDP growth in the EU. In 2013 only Albania, Bosnia and Herzegovina, Montenegro and Serbia were closer to the EU-28 average than in 2005. These countries have very small economies and low GDP per capita. The Progress made by these countries is much less in absolute terms than the decrease of economic activity in the larger economies of Italy, Greece and Slovenia. Italy has fallen from above to below the EU-28 average, while the gap between Greece and the EU-28 average increased from only 10 % in 2005 to almost 30 % in 2013.

[14] One of the authors has been in a position to read through or conduct a number of population or residential consumption surveys and write extensively on energy poverty in the region (from 2003 to the present).

In 2013 **Italian** GDP comprised the following: [15] 2.31 % agriculture, forestry and fisheries, 18.03 % industrial production, 5.24 % construction, 24.19 % commerce, maintenance, hotels and restaurants, transport and communications, 29.03 % financial intermediation (including real estate) and 21.20 % other activities and services (including public administration). GDP and population density in Italy are many times larger than in the other AIR countries: Italy's GDP density is for example almost seven times that of Croatia and 12 times that of Serbia. **Slovenia** is the only country that demonstrates a positive foreign trade balance due to its exceptionally good terms of trade with other former Yugoslavia economies. **Montenegro** outperforms the entire AIR in terms of relative volume of foreign direct investment (FDI). In this small country, in 2005, FDI relative to GDP amounted to over 22 %, by comparison with only 10 % in 2013; however, even 10 % is beyond the 1-2 % figure for other countries. **Albania** has achieved a steady rise in FDI inflow, from 3 % of GDP in 2005 to almost 10 % in 2013, and its economic performance exhibits growth in GDP, foreign direct investment, stock gross debt and gross external debt, as well as high gross value added in construction and agriculture, but it is still a very poor economy by European standards. Albania is largely excluded from international markets, a fact that has mitigated the impact of the 2008 financial crisis on its economy. It has continued its own economic development path, outperforming Bosnia and Herzegovina and Montenegro in terms of density of economic activity as well as in relative GDP per capita, even though their position in 2005 was almost identical. The economic performance of **Bosnia and Herzegovina** is in contrast to its complex political situation. The country is improving in terms of GDP, FDI stock and employment; it has reduced imports in order to improve the foreign trade balance and achieve a decrease in domestic spending. **Croatia** continues to leverage its GDP formation by increasing its debt and improving its trade balance: it now has a positive trade balance and its tourism performance is improving thanks to investment inflow and lower energy prices. There are signs that the Croatian tourist industry is now attracting markets such as the USA (a traditional market before the 1990s) and China. Despite the economic crisis, **Serbia** has improved its GDP per capita (at PPP) in relation to the EU-28, from 31.5 % in 2005 to 36.7 % in 2013. Gross capital formation has declined as a share in GDP while foreign trade has increased. Serbia also now has a higher foreign debt to GDP ratio. In **Greece,** GDP per capita (at PPP) relative to the EU-28 average has fallen from 89.5 % to only 71.5 % (detailed data on economic performance are available in Annex 1).

The global economic crisis is only one aspect of the economic problems in the Balkans. Balkan economies are heavily dependent on natural resources and the export of natural resources, which are in some cases highly energy-intensive products.

Table 6: Dependence on natural resources in the AIR

	Aluminium bauxite	Cooper	Lignite	Cement	Timber	Crude oil & natural gas	Hydro	Other metal
Albania				X			X	
Bosnia and Herzegovina	X		X	X	X		X	X
Croatia	X			X	X	X	X	
Greece	X		X	X		X*		
Italy				X		X	X	
Montenegro	X		X		X		X	X
Serbia	X	X	X	X	X	X	X	X
Slovenia	X		X		X		X	X

Source: Author's analyses (2015)
*Imported, processed and exported (likely at negative return on capital)

[15] According to the Statistical Classification of Economic Activities in the European Community, Rev. 2 (2008)

The devastation of forest areas arising from timber export and use of fuel wood for domestic heating is a critical issue in terms of land use in Serbia, Bosnia and Herzegovina, Montenegro and parts of Croatia and Albania. Although Slovenian forests seem to be managed in a more sustainable way, wood export remains an important aspect of the economy. A lack of appropriate means of transport only decreases returns for forest owners and the economic value of land, which have actually collapsed in most forest areas.

Aluminium and copper processing, cement production and petrochemical processing are all energy-intensive industries. These industries are supported by exploitation of lignite, crude oil, natural gas and hydro resources in the AIR, in combination with a disregard of the massive environmental impacts that are not properly factored into the costs of production. Lignite, crude and gas resources are available in the Balkans, but at exceptionally low quality and productivity levels.

When international energy prices are very high, **energy resources in the Balkans** (if one ignores the environmental impacts) **appear competitive in terms of international benchmarks,** a fact which potentially supports the competitiveness of energy-intensive industries (steel, aluminium, cooper, cement), **but at significant cost to society.** It is typical for economies dependent on natural resources to use these opportunities to leverage their financial position by increasing their foreign debt. However, when the international price of energy (oil) drops below the immediate extraction costs of lignite and oil and gas in this region, the competitiveness of these industries suddenly evaporates, output drops, GDP decreases and debt–to–GDP ratio expands. A similar situation was experienced in former Yugoslavia during the 1985–1990 period, just before the break-up of the country.

Massive hydro resources were previously exploited very effectively in former Yugoslavia[16]. **Following the break-up of the country, most of these resources turned into cross-border resources, causing significant disputes and limiting their scope of use.** As a consequence, the financial performance of these hydro resources remains limited.

Problems with the competitiveness of the petrochemical, aluminium, steel and copper industries are further affected by the development of a large industrial base in non-European countries and the increase in capacity of the Suez canal. This trend fundamentally affects the sustainability of the economic model in the Balkan area, well beyond the impact of economic crisis. Gradually imposed strict EU environmental regulation further decreases the efficiency (and even the existence) of the lignite and cement industries; this is another trend that will exceed the impact of the economic crisis.

The region is now at the beginning of a massive transformation of its industrial model, which is necessary in the context of financial and economic problems magnified by the economic crisis. Governments in the region are focused on the financial and fiscal impacts of the crisis and tend to neglect the long-term impacts of fundamental changes in the Mediterranean and international markets. No country in the Balkans has a comprehensive industrial policy to address these problems.

The areas of the Eastern Adriatic are engaged in a delicate transition towards self-sustaining economies with the aim of reducing their dependence on international economic assistance. **The tertiary/service sector of the Eastern Adriatic economies is low, while agriculture still accounts for a considerable part of added value.** In particular, Albania is the country of the AIR where agriculture contributes more to GDP compared to any other economic sector, although its share is gradually declining (in 2000, it represented more than 50 % of GDP). The **industrial sector**, **including mining, is undoubtedly the sector that suffered the greatest setback in the years of civil war and socio-economic crisis,** which resulted in the destruction of infrastructure and the cessation of the main productive activities. Since 2000 a sharp recovery has been recorded in the

[16] See Chapter 3 on energy.

industrial and construction sectors (Bosnia and Herzegovina and Albania), and in the manufacturing and services sectors (Croatia). **Tourism and financial services occupy an important place in the tertiary sector,** with a continuous expansion especially in Croatia and Albania.

The Adriatic and Ionian Seas are a major source of food for the local population and tourism. The Ionian Sea is an open sea and part of the wider Mediterranean Sea. By contrast, the Adriatic Sea is classified as a narrow sea that is mostly shared between coastal countries. Therefore, fisheries (and generally use of sea resources) are regulated by appropriate agreements. Serbia does not have direct access to the Adriatic Sea, while access of Bosnia and Herzegovina is very limited. This obviously limits access to fishing for these two countries, which thus have only limited production (despite access to inland waters).

It is interesting to note that the entire AIR is a net importer of fish and fishery products, while supply of these products per capita is below the European average. Supply per capita is above the European average only in Italy, while that country still demonstrates a fish share in total protein intake below the European average. Only in Croatia does fish protein as a share of total protein exceed the European average.

Box: Crisis in Greece

Greece was heavily affected by the financial crisis at the end of 2008. In 2013, Greece's GDP was 26 % below that for 2007 (at 2010 prices and exchange rates), imports dropped by more than 38 %, exports by almost 12 % and domestic investment by an astonishing 63 %. All of this combined to reduce private and public consumption by 25.6 % and 19.3 % respectively[17]. In terms of GDP, Greek infrastructure investments fell by 2.4 percentage points of GDP during the period 2006-2012. The historical economic multiplier of infrastructure investments in Greece is 2x – that is, for any unit of investments the country gains 2 units of additional GDP. This investment gap caused a significant drop in GDP despite efforts to increase exports[18]. Most infrastructure development was financed by the state (15-20 %), EU funds (20 %+), EIB and banks (45-50 %) or equity (10-15 %)[19]. Material-intensive investment in transport and energy covered 90 % of Greek infrastructure investment. As a consequence, material and labour engaged in infrastructure investment projects have been effectively exported in the short term and then purchased back over repayment of loans. Decrease in investment caused, for example, a drop in domestic cement production of 52 % (in 2013 by comparison with 2009)[20]. Looking beyond financial characteristics, this process demonstrates that Greece was a natural resource-based economy depending on extraction of lignite and cement and exploitation of its geographical position for tourism. However, as Table 10 in this paper indicates, tourism's contribution to GDP in relative terms is below its actual absolute revenues. This points to the import intensity of tourism in Greece.

Greece is one of the most carbon-intensive economies in the EU due to its massive lignite extraction and low efficiency combustion. The investment backlog includes new lignite -fired power plants aiming to retain carbon intensity but provide more electricity to the market. That strategy may not be feasible in a carbon-constrained world.

Facing a drop in domestic investment, Greece made efforts to boost exports, but it seems that its export potential reached its maximum at about 32.5 % of GDP – way below the EU average of 46.7 %. Even with all possible efforts, most export sectors performed below their 1998 levels. Export boosts came from shipping services (which doubled their export share) and mineral fuels and chemicals (which more than quintupled their share)[21]. That achievement came with a caveat: unit prices of crude oil, petrochemicals and shipping services decreased following developments in international markets. Taking into account the efficiency levels of oil refineries

[17] Monokroussos, Platon, 'Greece – Greek shipping and its contribution to the domestic economy', Eurobank, January 2015, p. 2.
[18] Price Waterhouse Coopers (PWC), Infrastructure in Greece report, December 2014.
[19] Ibid.
[20] Ibid.
[21] Monokroussos, Platon, 'Greece – Greek shipping and its contribution to the domestic economy', Eurobank, January 2015, page 6.

and shipping services in Greece (in comparison with modern international standards), this means difficulties with terms of trade[22]. In other words, beside financial crisis, Greece is facing serious structural weaknesses regarding its competitiveness that cannot be covered by foreign loans for infrastructure investment. If one examines the list of projects[23], it is obvious that these projects are not going to mark a serious turnaround in business as usual towards long-term sustainability. The list is 'more of the same' and is not adjusted to the future carbon-constrained world. The largest infrastructure projects (gas pipelines, LNG terminals) are dependent on third parties (external sovereign - not private - investors that may have strategic and political considerations regarding investment) and on highly uncertain demand on the European market. The largest ongoing project is the Ptolemaida V lignite-fired power plant, which is likely to lock up carbon-intensive power generation in Greece for decades and expose the country to serious risks. This plant is intended to replace older and less efficient plants: this at first may seem to be an improvement, but the lock-up effect may well exceed the positive effects of better energy efficiency. Furthermore, Greece pledges to retain its remaining lignite power industry using 'economic austerity' as an excuse. In Greece, total greenhouse gas emissions increased from 1990 to 2009 and then fell somewhat afterwards, mostly owing to the economic slowdown[24]. The biggest source of energy in Greece is imported crude oil (and oil products), providing the greater part of heating and essential services to the islands. In addition to these challenges, in a recent publication of the World Resources Institute[25] Greece is indicated as the country most exposed to water stress in Europe. These aspects indicate a growing natural and structural deficit, as well as exposure to significant risks and development constraints in the near future.

A recent paper[26] exploring development options for Greece underlines the need for 'structural reforms' and further austerity measures/savings. In our view, this paper underestimates the decreasing competitiveness of the Greek economy in technical terms, including exposure to risks and growing obsolescence of its export potential. It is not likely that this economy will turn to a sustainable development path without physical intervention into its power generation asset portfolio and its transportation assets. Such a change requires a considerable turnaround in national energy and transport policy that is not justified without support from the immediate neighbourhood – the AIR.

Interesting initiatives (such as a sustainable development plan for the City of Athens) aimed at opening up investment opportunities and making use of available external funding are likely to fall short in size, scope and geographic coverage as regards the need for reorientation of national development policies. From another perspective, a national development policy for Greece would require complementary policies in the AIR to obtain results. For example, a massive orientation of Greece towards solar energy (justified by its geographic position but requiring a fundamental shift in its energy policy away from lignite) requires the significant development of hydro resources in the rest of Balkans, in an entirely new development fashion (or dimension) by comparison with the traditional use of hydro resources in this region.

An important lesson from the Greek case for the rest of the northern AIR countries is that support from extractive industries (lignite, cement, hydro power) to exports (through a complex chain of cross-subsidies) is only possible if prices of international energy sources (crude oil, natural gas, traded coal) are sufficiently high in relative terms to justify high extraction costs (where domestic resources are less productive in terms of international comparison). The combination of low international energy prices and high domestic extraction costs (most Balkan lignite mines are even less productive than Greek mines) creates underlining risks for all AIR Balkan countries.

[22] A country's terms of trade measure its export prices in relation to its import prices. Worsening terms of trade means that a country has to export more to purchase a given quantity of imports (See for example: http://www.economicsonline.co.uk/Global_economics/Terms_of_trade.html).
We may also note the profound impact of the stream of low-cost shipping services from Greece to the rest of the AIR and the strong competitive pressure thus placed on ports, transport infrastructure and other economic sectors in the AIR countries.

[23] Presented at Price Waterhouse Coopers (PWC), Infrastructure in Greece report, December 2014.

[24] IEA, Energy Policy Review of Greece, 2011.

[25] See: http://www.wri.org/blog/2015/08/ranking-world%E2%80%99s-most-water-stressed-countries-2040 and http://www.wri.org/sites/default/files/uploads/water_stress_world_map_large.jpg

[26] Schrader, Klaus, Bencek, David and Laaser, Claus-Friedrich, 'Greece: How to Take a Turn for the Better', Kiel Policy Brief 83, Kiel Institute for the World Economy, January 2015.

Table 7: Food balance sheet of fish and fishery products in live weight and fish contribution to protein supply (data for 2011)

	Production	Non-food uses	Imports	Exports	Total food supply	Per Capita supply*	Fish/total proteins**
	Tonnes in live weight	Tonnes in live weight	Tonnes in live weight	Tonnes in live weight	Tonnes in live weight	kilograms	%
Albania	7 332	0	17 597	5 951	18 978	6.0	1.7
Bosnia and Herzegovina	10 014	0	17 323	4 496	22 841	5.9	1.8
Croatia	83 799	609	58 076	56 163	85 151	19.7	7.3
Greece***	196 486	1 056	169 576	146 711	218 295	19.6	4.8
Italy***	387 587	38 667	1 406 167	199 762	1 565 325	25.8	6.4
Montenegro	1 934	0	4 753	216	6 471	10.4	2.6
Serbia	12 960	0	42 062	3 187	52 302	5.4	1.8
Slovenia	1 711	21	28 821	8 426	22 091	10.7	3.0

*Europe average=22kg/capita; ** Europe average=6.5%; ***data include entire Mediterranean
Source: FAO, Yearbook on Fishery and Aquaculture Statistics (2012)

Limited availability of a fishery fleet in the Adriatic Sea and a decrease in the utilisation rate of the available fleet indicate a decrease in production and availability of fish and fishery products. Fish farming is also limited in the Adriatic Sea. The historical decline in the fish population and massive extraction of fish resources in the past, as well as inadequate regulations, period of war and sanctions have had a strong impact on this situation.

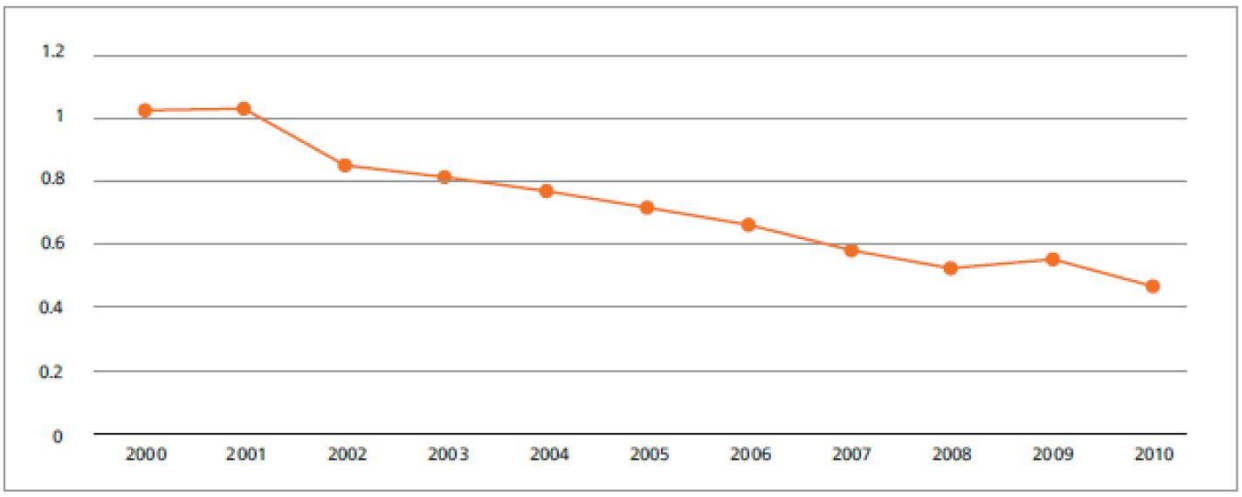
Table 8: Synthesis of the Adriatic fleet composition[27]

	Bottom trawlers	Pelagic trawlers	Purse seiners for small pelagic
Albania	168	0	15
Bosnia and Herzegovina	-	-	-
Croatia	800	0	400
Italy	1 225	136	48
Montenegro	30	n.a.	18
Slovenia	20	1	9
Total	2 243	137	490

Source: UNEP, Status and Conservation of Fisheries in the Adriatic (April 2014)

[27] The Adriatic Sea is a narrow sea as defined by international maritime regulation, and is governed by complex bilateral and multilateral arrangements. The following paper: Blake, Gerald Henry,Topalović, Duško and Schofield, Clive H. (1996), 'The maritime boundaries of the Adriatic Sea', IBRU (ISBN 978-1-897643-22-8) provides insight into these complex arrangements. The fishery industry in the Adriatic is separated from the rest of Mediterranean where Greek and Italian fleets are active; there is a UNEP report is dedicated to the Adriatic.

Figure 3: Total fishing day trends for the Northern and Central Adriatic trawler fleet for the period 2000-2010, index numbers (base year 2000)



Source: MiPAAF-Irepa, UNEP, Status and Conservation of Fisheries in the Adriatic (April 2014)

According to a report published in 2011 by CENSIS (www.censis.it), fisheries contribute EUR 4.4 billion to Italy's national GDP, and directly employ more than 59 000 people (plus about 27 000 indirectly), including inland and maritime aquaculture operators, 6 191 businesses. Of these, as per data provided by the National Observatory of Fishing (www.osservatoriopesca.it) about 30 % are partnerships, 21 % are limited companies and 26 % are shipowners. Distribution costs amount to 2.3 billion.

According to the national Fleet Register as at 1 September 2014 the capacity of the Italian fishing fleet amounted to 12 664 units, corresponding to 163 356 in terms of gross tonnage (11 % of European overall tonnage as at the end of 2010) and to an overall motor power of more than 1 GW.

Despite some strong points such as high quality of products and increasing attention to consumer and environmental protection rules, trends in this sector in recent years show a steady decline in national fish production. Since 2011 there has been a fall to under 400 000 tonnes/year. This contraction is attributable to sea fishing, while production from aquaculture activities remained roughly stable (about 148 000 tonnes/year, of which 50 200 of fish and 95 800 of molluscs, from the 877 plants active in 2009).

The Adriatic Sea area is not in a position to offer sufficient indigenous food supply to tourists visiting the area or to ensure food security for the local population from local resources. Apart from the immediate economic implications (food imports), this situation decreases the attractiveness of the region for tourists. Considerable efforts and cooperation within the AIR are required to facilitate redevelopment and sustainability of fish resources.

Despite well-known tourist attractions (biodiversity, coastal tourism, mountains, cultural and historical heritage, etc.), **South-eastern Europe[28] lags behind Central and Eastern Europe in tourist arrivals**.

The ranking by the World Travel and Tourism Council demonstrates the relative position of tourism in the AIR in comparison with the international market. The EU is the largest tourist destination in absolute numbers but the contribution of tourism to EU GDP and growth forecasts lag behind that for other world regions. AIR countries have mixed rankings, as demonstrated by Table 9 below.

[28] Only 3.8 % share in World Share in international tourist arrivals versus 8.7 % for Central and Eastern Europe. For comparisons, Western Europe accounts for 33.2 % and China for 8.3 %. All according to EEA data.

According to UNWTO, **in 2013 Italy was the fifth most visited country in the world,** with 47.7 million international tourist arrivals (2.9 % more than in 2012) and 184.8 million stays, generating USD 43.9 billion in revenue while the travel industry as a whole (national and foreign tourism) is estimated to contribute EUR 147 billion euro (9.4 %) to national GDP, employing approximately 2.5 million people (10.9 % of national employment).

According to ISTAT, Italy attracted almost 34 % of foreign tourists because of its cities of historical and artistic interest, about 23.6 % because of its maritime locations, 12.40 % to its lakes and 11.3 % to its mountains. The top 5 nations of origin are Germany, the US, France, the UK and Switzerland.

Accommodation is provided by 33 316 hotels (more than 2.23 million beds). An additional 2.49 million beds are provided by 124 205 accommodation establishments of other kinds, such as campsites, resorts, youth hostels, mountain lodges, and bed and breakfasts. The economy of the Italian Adriatic and Ionian regions relies largely on tourism, which is traditionally one of the most active and developed sectors.

Table 9: World ranking of tourism economic indicators out of 184 countries (European Union – World Ranking out of 12 world regions)

	ABSOLUTE SIZE in 2014	RELATIVE SIZE Contribution to GDP in 2014	GROWTH 2015 forecast	LONG-TERM GROWTH Forecast 2015-2025
Albania	106	33	177	96
Bosnia and Herzegovina	127	96	104	48
Croatia	55	19	132	86
Greece	29	41	97	110
Italy	7	84	147	182
Montenegro	141	34	7	3
Serbia	108	139	159	60
Slovenia	76	63	122	107
European Union	1	5	12	12

Source: WTTC Travel and Tourism Economic Impact 2015, Country Reports and EU Report

Massive **underutilisation of tourist capacities and infrastructure** in off-season periods is one of the obvious reasons for the development gap. The **low density of tourist accommodation on the Balkan side**[29], corresponding to a generally lower density of economic activity and population, arises from a somewhat smaller infrastructure capacity and relatively longer travel distances to destinations, as well as congestion during peak periods; it is thus relatively difficult for tourists to combine more than one destination. **During recent years accommodation density has grown, but has not been accompanied by a lengthening of the tourist season.** Increase in density of accommodation implies further **pressure on water resources, waste management, transport and energy infrastructures** (all of which are highly interdependent) during peak periods, while a low utilisation rate impedes the commercial development of new infrastructure.

Tourism directly provides about 1.7 million full-time jobs in the AIR countries (albeit some of those jobs in Italy and Greece are not directly related with the AIR) or over 4 million jobs in total (see Table 10). Overall, the direct and total contribution of tourism to GDP is more significant in the AIR than in the EU (with the exception of Bosnia and Herzegovina and

[29] Partial evidence is available at: http://www.medmaritimeprojects.eu/download/ProjectMediamer/Final_factsheets/WM_Tourism_factsheet.pdf

Serbia). Exports through tourism (to foreign visitors) as a share of total exports are also higher in all AIR countries than the value of the same indicator for the EU.

Table 10: Tourism in the AIR: relative impact of tourism activities

Direct contribution to GDP (%)	2007	2014	2015e	2025f
Albania	6.33	5.93	5.67	6.19
Bosnia-Herzegovina	3.04	2.52	2.54	2.99
Croatia	11.13	12.53	12.86	16.81
Greece	6.14	6.98	7.10	7.91
Italy	4.19	4.08	4.15	4.63
Montenegro	11.91	9.52	9.78	14.75
Serbia	1.53	2.07	2.11	2.52
Slovenia	3.08	3.50	3.52	3.77
European Union	3.68	3.62	3.67	3.98
Total contribution to GDP (%)	**2007**	**2014**	**2015e**	**2025f**
Albania	23.33	21.01	20.09	21.82
Bosnia-Herzegovina	11.28	9.29	9.32	11.01
Croatia	27.82	28.28	28.61	36.21
Greece	17.53	17.32	17.57	19.82
Italy	11.05	10.06	10.21	11.00
Montenegro	23.59	20.04	20.95	31.92
Serbia	4.70	6.12	6.21	7.17
Slovenia	10.86	12.70	12.74	13.85
European Union	10.04	9.66	9.78	9.42
Direct contribution to employment (% of employment)	**2007**	**2014**	**2015e**	**2025f**
Albania	5.62	5.35	5.13	5.78
Bosnia-Herzegovina	2.89	3.03	3.06	3.78
Croatia	12.92	13.56	13.78	16.29
Greece	8.11	9.41	9.55	10.42
Italy	4.78	4.84	4.91	5.97
Montenegro	9.85	8.64	8.91	13.45
Serbia	2.58	2.57	2.60	3.19
Slovenia	3.50	3.92	3.97	4.45
European Union	4.96	4.95	5.03	5.69
Direct contribution to employment (000 jobs)	**2007**	**2014**	**2015e**	**2025f**
Albania	52.53	50.71	50.33	62.28
Bosnia-Herzegovina	18.44	20.47	20.98	25.66
Croatia	149.00	139.33	144.90	172.90
Greece	365.46	340.31	353.14	445.56
Italy	1108.96	1082.00	1100.10	1375.38
Montenegro	15.41	14.94	15.71	25.16
Serbia	36.93	35.21	35.56	42.27
Slovenia	29.92	31.12	31.58	37.08
European Union	11180.20	11061.60	11315.80	13123.40
Total contribution to employment (% of employment)	**2007**	**2014**	**2015e**	**2025f**
Albania	23.33	21.01	20.10	21.82
Bosnia-Herzegovina	11.28	9.29	9.32	11.01
Croatia	27.82	28.28	28.61	36.21
Greece	17.53	17.32	17.57	19.82
Italy	11.05	10.06	10.21	11.00
Montenegro	23.59	20.04	20.95	31.92
Serbia	4.70	6.12	6.21	7.17
Slovenia	10.86	12.70	12.74	13.85
European Union	10.04	9.66	9.78	10.42
Total contribution to employment (1000 jobs)	**2007**	**2014**	**2015e**	**2025f**
Albania	196.59	181.81	180.38	219.67
Bosnia-Herzegovina	68.32	72.11	73.74	89.09
Croatia	363.69	310.33	318.69	374.37
Greece	878.21	699.86	727.06	951.19
Italy	2866.08	2553.04	2588.49	335.82
Montenegro	31.24	31.96	34.18	55.34
Serbia	82.22	87.25	87.83	99.99
Slovenia	96.60	103.40	104.29	121.81
European Union	26018.20	24693.90	25206.50	28366.90
Visitor Exports (Foreign spending) (% of exports)	**2007**	**2014**	**2015e**	**2025f**
Albania	49.05	30.44	26.93	24.22
Bosnia-Herzegovina	19.65	13.04	11.82	13.24
Croatia	38.36	43.66	42.09	48.33

Direct contribution to GDP (%)	2007	2014	2015e	2025f
Greece	28.98	24.46	23.36	21.38
Italy	7.36	7.42	7.48	6.95
Montenegro	39.83	54.27	47.29	51.61
Serbia	8.31	6.55	5.95	6.99
Slovenia	7.37	7.96	8.08	8.79
European Union	6.21	5.93	6.11	6.05

e = estimate, f = forecast

Source: WTTC Travel and Tourism Economic Impact 2015, Country Reports and EU Report

Tourism is of high importance to GDP, employment and trade balances in the AIR countries. However, **long-term growth forecasts for major tourism markets (Greece and Italy) are far below the world average.** Even though tourism is likely to retain relative importance in AIR countries (see projections to 2025), other tourist markets are likely to capture a larger share in the overall growth of the tourist industry.

While some preconditions for growth of tourism are present in the region (accommodation, transport infrastructure), other aspects (energy, indigenous food supply, lack of multimodal transport infrastructure integration) limit growth prospects. As a consequence, **cruising and maritime tourism are growing** (as being less dependent on local infrastructure and supplies), **while other forms of tourism remain limited to the relatively short tourist season.** The low utilisation rate of available infrastructure impedes investment in new and/or complementary infrastructure.

The growth in cruising and maritime tourism confirms this finding: accommodation on cruise ships emerges as an option for those who are looking to combine more attractions within a given timeframe and budget. Although spending by cruise passengers contributes to local economies, it is not sufficient to compensate for their lack of contribution to the utilisation rate of the local infrastructure.

Figure 4: Maritime tourism in the Adriatic Sea in 2013 at a glance

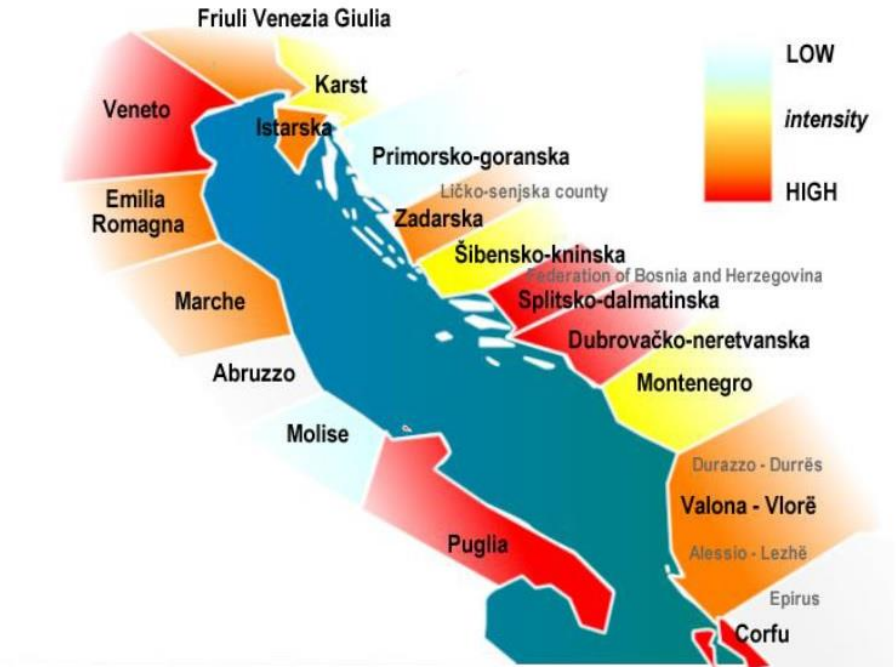
Source: Risposte Turismo (2014), Adriatic Sea Tourism Report

There are three major components of maritime tourism: cruises, ferry travel and boating/sailing tourism. The Adriatic Sea is well equipped for all three kinds of tourism, while investment in infrastructure and capacities is ongoing.

The intensity of marinas and berths infrastructure is growing. Some of the largest Mediterranean marinas are already located in the Adriatic area, and all of them are planning some further investment.

Figure 5: Maritime tourism intensity per region

Map *Maritime tourism intensity in the Adriatic regions (combination of cruise, ferry, sail and yacht tourism)*



Source: Risposte Turismo (2014), Adriatic Sea Tourism Report

Table 11: Berths and shares of medium-large structures (> 400 berths), per country, 2014

COUNTRY	Berths		Structure		Share on total[30]	
	value	% share	value	% share	berths	structure
Croatia	11 202	25.1 %	16	23.8 %	14.6 %	5.0 %
Greece[31]	1 855	4.1 %	2	3.0 %	2.4 %	0.5 %
Italy[32]	25 486	57.0 %	42	62.7 %	33.1 %	13.0 %
Montenegro	3 508	7.8 %	4	6.0 %	4.6 %	1.2 %
Slovenia	2 700	6.0 %	3	4.5 %	3.5 %	0.9 %
Total	44 751	100 %	67	100 %	58.2 %	20.6 %

Source: Risposte Turismo (2014). Adriatic Sea Tourism Report.

[30] Share of medium and large structures in total structure.
[31] Only Atlantic ports are considered.
[32] Only Atlantic ports are considered.

Table 12: Density of boat structures and berths per Adriatic region, 2014

COUNTRY	REGION	COASTLINE (KM)	BERTH/KM[33]	KM PER STRUCTURE
Albania	Vlorë	244	1	244
Croatia	Istarska	539	7	45
	Primorsko-goranska	1 065	3	89
	Zadarska	1 082	5	18
	Sibensko-kninska	806	6	40
	Splitsko-dalmatinska	1 064	2	66
	Dubrovacko-neretvanska	1 025	1	171
Greece	Corfu	200	9	100
Italy	Puglia (Adriatic coast)	560	15	12
	Molise	35	23	18
	Abruzzo	133	20	19
	Marche	180	32	14
	Emilia Romagna	130	51	5
	Veneto	170	66	4
	Friuli - Venezia Giulia	130	89	3
Montenegro	Montenegro[34]	294	12	37
Slovenia	Karst	47	62	8

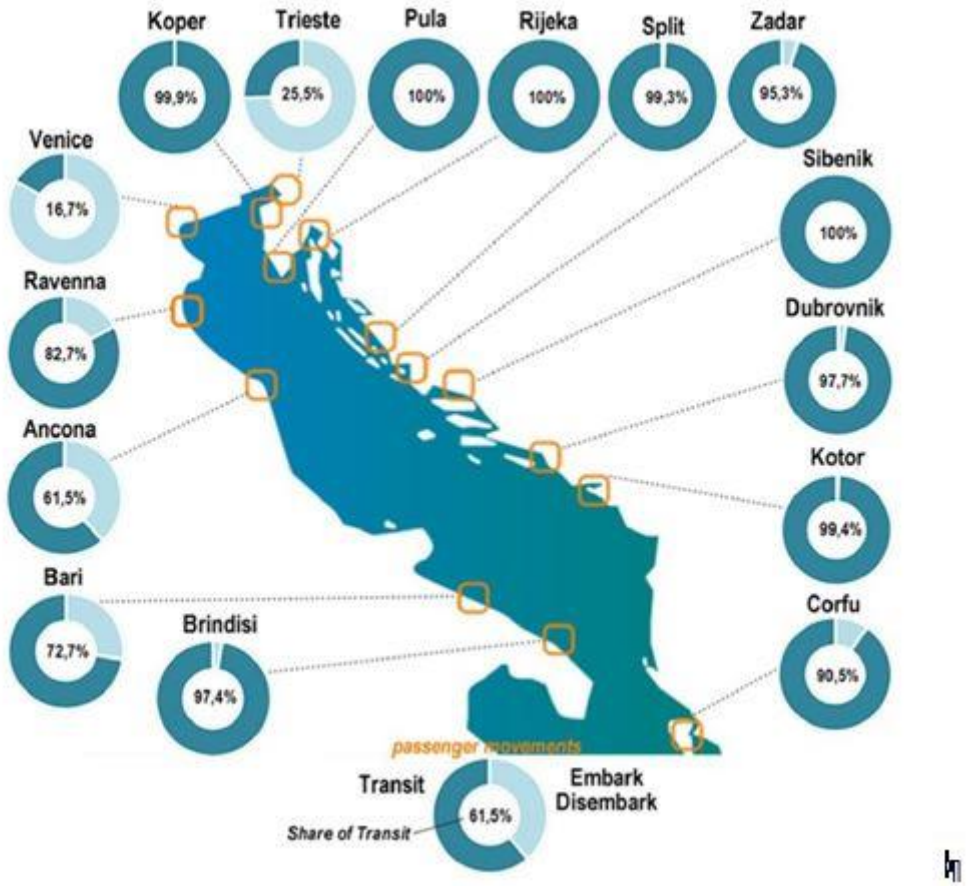
Source: Risposte Turismo (2014). Adriatic Sea Tourism Report.

Ferry traffic is part of tourism infrastructure but also part of the public transport infrastructure. Cruising tourism is growing in the Adriatic Sea, even though port infrastructure, and in particular linkages between ports and coastal areas are not favourable. **A major impediment to growth of cruise tourism is the limited ability to move tourists from the cruising ship or port deeper into the territory towards various tourist attractions.** Consequently, some large areas away from the coastline are deprived of tourists and tourist visits are limited to the local attractions. Lack of adequate infrastructure integration between cruise ports and airports limits the ability of operators to embark/disembark tourists at the port. As a consequence, transit mainly prevails in ports (and even within the ports in areas) that are located at closer proximity to airports or railway stations. The cruise ports of Dubrovnik, Kotor, Split, Zadar, Rijeka and Pula are all near international airports, while Koper, Pula and Rijeka have good rail links.

[33] The values have been rounded either up or down to whole numbers.

[34] Overall Montenegro coastline. The table does not include some regions without structures, such as Licko-Senjiska county in Croatia (200 km of coastline), 23.5 km of Bosnia's coastline, Lezhe (38 km) and Durrés (62 km) in Albania, or Epirus in Greece (200 km).

Figure 6: Cruise traffic at a glance (2013) - percentage distribution of cruise traffic between embarks/disembarks and transits



Source: Risposte Turismo (2014), Adriatic Sea Tourism Report

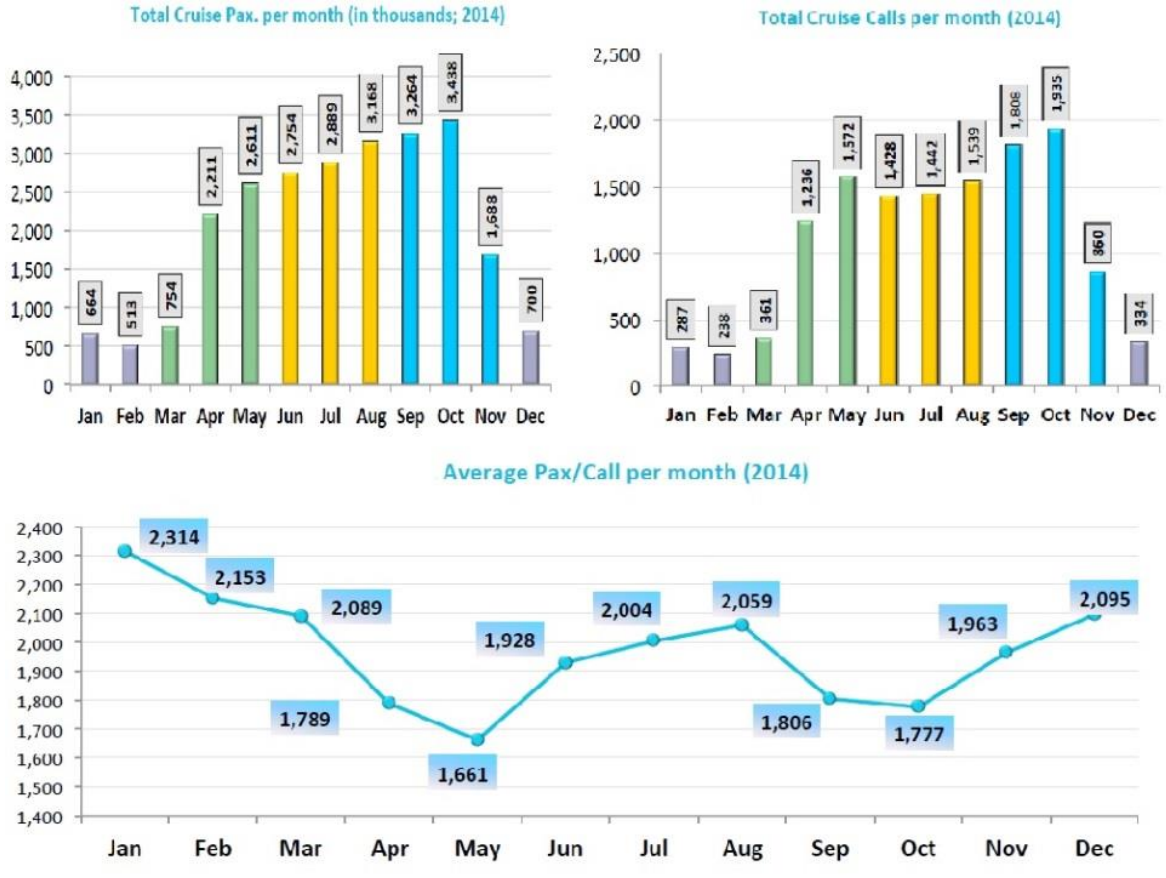
Cruising shipping systems require massive port infrastructure to supply ships with energy and water, but also with food and other necessities during their stay in the port. Waste management also needs to be provided for. **If port infrastructure is not available, ships are forced to run ship systems (diesel engines, waste treatment, water supply (desalination), etc.) during their stay in the port. This practice is more polluting and much more expensive than provision of those services from coastal infrastructure.** Higher costs of shipping services limit tourist spending on-shore. Initiatives for LNG bunkering (provision of clean fuel for shipping), stronger power supply infrastructure in the ports and more comprehensive waste management are still rudimentary in the AIR.

There is a growing trend of cruise tourism in the Adriatic Sea, in terms of number of tourists while the number of cruise ship calls to ports in the region is decreasing. This points to an increase in the unit size of cruise ships and growing confidence of operators in sales and utilisation of available ship capacity - that is, more passengers on board ship. Growing number of passengers/tourists on board and larger ships are posing a growing challenge to local infrastructure (energy, transport, water and food supply) and tourist organisations, as they need to provide more capacity in a limited period of time.

Figure 7 Growing cruising tourism in the Adriatic Sea - trend in cruise passenger movements and growth rates in the main 10 Adriatic cruise ports, 2004-2013

Source: Risposte Turismo (2014), Adriatic Sea Tourism Report

Figure 8: Seasonality and growth in cruising tourism



Source: MedCruise
Note: PAx is abbreviation for "passengers"

Congestion and pressure on existing infrastructure create pressure on tributary businesses and local communities (whose particular culture and traditions might be a tourist attraction, but which lack the capacity to accommodate large numbers of tourists without losing attractiveness), as well as tensions between local and strategic tourism industries. **Opposition of local population to major tourism developments** is well known and can be a frequent cause of friction between local communities.

A new development paradigm for the tourist industry is necessary. Governments have to find a way to **involve local communities** in the strategic development of tourism industry, **preserve local heritage** and **facilitate strategic investment in accommodation and infrastructure**; in doing so, communities must be aware of **possible climate change impacts and environmental limitations**.

Finally, a longer tourist season is critical for the development of the entire AIR. Innovative ways to lengthen the tourist season, **renewable energy** sources to facilitate such development, and **more resilient transport** solutions are all critical ingredients of future development.

Box: Linkages to the Danube region

LINKAGES TO THE DANUBE REGION

Geography, natural resources and climate change impacts

Loss of forest cover (deforestation, coppicing of forests) and lack of reforestation during a period of 25 years is a critical process that magnifies climate change risks in the Balkan region; deforested mountains retain heat and delay condensation of the moist Mediterranean air mass. As a consequence, precipitation is translated to North and West, to the other side of the mountains and other catchment areas: the Adriatic Ionian catchment receives less precipitation and the Danube one receives more. There is less forest cover to conserve water on the territory; consequently, precipitation converts into flooding that overcomes available hydropower accumulation lakes, with floods and landslides as immediate consequences.

Map 3: Balkan floods, May-September 2014

Source: EuroActiv

In 2014, massive floods across the entire region were the consequence of this problem described above that has been building up over time. During this period, the Iron Gates dam on Danube (controlling the largest accumulation lake in Europe) was forced to discharge water at unprecedented speed and this was not sufficient. The use of accumulation systems across the Dynaric Alps and in northern Serbia is limited by lack of implementation of the EU water directive: too many institutions regulate water flows in the same catchment area. Many water flows are cross-border or even underground (through porous Dynaric rock). Despite the major political breakthrough achieved in establishing the Sava River Commission in recent years, response capacity is limited as the Sava river itself is not well equipped with accumulation or hydropower resources. During the floods of 2014, the impact of the Sava was very limited and eradication was effective: critical impacts were caused by tributaries. At the peak of the crisis, regional cooperation (even if limited in scope) was indispensable.

This flooding sequence tested coordination and regulation arrangements, as well as the technical capabilities of most critical infrastructure in the Balkans and along the Danube. It revealed a need for much better use of existing resources and infrastructure and rapid implementation of the advanced EU water framework.

Furthermore, these events underline the need for massive reforestation and melioration of coppice forests across the region. Much more forest cover is needed as soon as possible to prevent further similar disasters[35]. Only sustainable production and use of biomass in the energy sector, which is of very high productivity, may underwrite social investment in such a massive forestry reconstruction.

Energy and transport linkages

The most obvious link between energy and transport is the provision of clean and efficient transport fuels; however, efficient and low-cost transport makes market penetration of these fuels more likely. The energy sector may also become a massive consumer of transport services if it turns toward renewable energy (especially biomass) on a large scale. Somewhat less obvious are the spatial interlinkages between critical energy and transport infrastructures (roads and railways with hydro power plants or forest areas, port terminals, etc.). These linkages require complex coordination at both policy and technical level.

Tourism linkages

Changes in water inflows and availability directly affect the most valuable tourist areas in the Balkan peninsula, as well as local food production in many critical karst valleys.

[35] One of the authors was in position to analyze flood sequence with a panel of leading forestry experts from Bosnia and Herzegovina, Croatia, Montenegro and Serbia during and immediately after events as well as to travel to most affected areas.

2. Analysis of the Transport Sector

KEY FINDINGS

- The growth in container transport and decrease in bulk transport provide commercial opportunities for economic development in the AIR. Growth in throughput in major seaports and utilisation of rail links are promising.
- Transport from ports in the southern part of the Balkan peninsula towards inland destinations is still underdeveloped, even in comparison with the state of play in the 1980s.
- There is lack of integration between transport modes: ports are not linked with airports and railways, railways are not integrated with inland waterways, and inland navigation is not linked to river-to-seagoing navigation. Not one airport In the Western Balkans is integrated with railway infrastructure. Fragmentation limits the development potential of transport.
- Most investment and spending are focused on road infrastructure and too little on railway infrastructure or intermodal integration.
- International operators are entering the market and exploiting inefficiencies in European infrastructure and transport corridor planning.
- Changes in the transport market provide new opportunities in the energy industry (and vice versa).
- Passenger transport opens up new opportunities for tourism, agriculture and energy.
- Transport regulation for the Danube is governed by the 1946 Danube Convention, which prevents most modern commercial transport solutions and implementation of EU inland waterway regulations.

Major transport infrastructure projects in the Balkans are considered in the context of the **South East Europe Transport Observatory** (**SEETO**)[36] and in compliance with the **EU's Trans-European Transport Network (TEN-T)**. The SEETO signatory parties have adopted a transport strategy for the south-east Europe region in the form of the SEETO Comprehensive Network[37]. This comprises a number of soft measures intended to **liberalise transport markets** and **decrease the cost of transport**, as well as to **improve and harmonise regional transport policies and technical standards and integrate the SEE infrastructure into the framework of the wider TEN-T**.

Key objectives envisaged by the transport strategy and the SEE 2020 strategy are:

- Reduce transport costs by 20 %;
- Raise transport infrastructure utilisation rates to over 40 %;
- Decrease energy consumption per unit of transport services by 20 %;
- Increase the share of railway and waterborne transport;
- Facilitate air transport.

The critical objective of the strategy, to **improve the utilisation rate of transport infrastructures,** is very much dependent on measures in tourism, energy, agriculture and industrial sectors, as well as on stronger integration into the wider European transport market.

[36] http://www.seetoint.org/
[37] http://www.seetoint.org/seeto-comprehensive-network/

Table 13 compares the Logistics Performance Indexes (LPIs) of AIR countries. It indicates that AIR countries have an average logistics performance (ranging between 38 and 81 among 160 countries analysed), with the exception of Italy, which performs far better than the rest. This indicates that AIR is not exploiting its geographical location and opportunity to serve the European market with better logistical services toward the Mediterranean and the Suez canal. The best performer – Italy – is distanced from Central Europe by geographical obstacles and by the rest of AIR where adequate logistical services are not provided.

Table 13: International Logistics Performance Indexes (LPIs) results by country

	ALBANIA	BOSNIA AND HERZEGOVINA	CROATIA	GREECE	ITALY	MONTENEGRO	SERBIA	SLOVENIA
2014								
LPI Rank[38]	N.A.	81	55	44	20	67	63	38
LPI Score[39]	N.A.	2.75	3.05	3.20	3.69	2.88	2.96	3,38
% of highest performer	N.A.	56.0	65.8	70.5	86.2	60.1	62.9	76.3
Customs Score	N.A.	2.41	2.95	3.36	3.36	2.83	2.37	3.11
Infrastructure Score	N.A.	2.55	2.92	3.17	3.78	2.84	2,73	3.35
International Shipments Score	N.A.	2.78	2.98	2.97	3.54	3.15	3.12	3.05
Logistics Quality and Competence Score	N.A.	2.73	3.00	3.23	3.62	2.45	3.02	3.51
Tracking and Tracing Score	N.A.	2.55	3.11	3.03	3.84	2.76	2.94	3.51
Timeliness Score	N.A.	3.44	3.37	3.50	4.05	3.19	3.55	3.82
Average 2007-2014								
LPI Score	2.69	2.78	3.02	3.08	3.67	2.66	2.84	3.27
Customs Score	2.35	2.46	2.89	2.96	3.34	2.57	2.35	3.01
Infrastructure Score	2.38	2.57	2.93	3.05	3.74	2.60	2.60	3.22
International Shipments Score	2.78	2.86	2.95	2.89	3.49	2.76	3.00	3.11
Logistics Quality and Competence Score	2.57	2.71	2.90	3.04	3.65	2.40	2.85	3.33
Tracking and Tracing Score	2.55	2.62	3.05	3.09	3.80	2.64	2.88	3.34
Timeliness Score	3.41	3.42	3.40	3.50	4.04	2.99	3.27	3.66

Source: The World Bank

[38] Out of 160 countries
[39] All scores are from 1 (worst) to 5 (best),

2.1. Road infrastructure

While Italy has a mature road transport market, new highway and road construction is still taking place in the Balkan peninsula, both inside countries and toward cross-border integration.

The estimated length of the Italian **road network** (entirely paved) is 837 493 km, including municipal, provincial and regional roads (managed at the respective level) and highways/freeways (25 395 km, of which 19 320 are highways), managed by the State-owned company ANAS S.p.A. (www.stradeanas.it), which is in charge of all planning, maintenance, security and environmental issues and activities (in special-status regions, such as Trentino-Alto Adige, road management is in many cases autonomous).

Italy has an important and expanding **motorway network** of about 6 800 km, including 938 km of freeways managed by ANAS S.p.A, while the majority are managed by private companies under concession; the largest of them in terms of length of the managed network (2 845 km, about ten times the figure for every other company) being Autostrade per l'Italia S.p.A. (www.autostrade.it). The network, including 644 tunnels with a total length of 789 km (of which 3 international, 25 km in total) and 1 556 bridges and viaducts (982 km in total), is mostly concentrated in the north-western part of the country: the Adriatic-Ionian part consists mainly of the A14 (743 km), from Bologna to Taranto, which for the most part crosses the Adriatic coastline taking in Emilia-Romagna, Marche, Abruzzo and Puglia and is the most important transport infrastructure for tourist activities.

According to the Italian Association of Toll Concessionaire Companies and Motorway Networks (www.aiscat.it), in 2013 the overall motorway network produced a total of EUR 6.66 billion in revenue. While motorways still accounted for the main transport flow (carrying roughly 3 times as many passengers and 10 times as much in freight as rail), traffic has decreased since 2011 owing to the slowdown in economic activity. This could have an impact on the short-term profitability prospects of new investments.

In terms of development strategy, the main issues under discussion at the time of writing of this study were the **need to increase the efficiency of the motorway network** in terms of 'free flow' toll collection systems (eliminating tollbooths and barriers), rationalisation of freight transport through intermodality, modernisation of the freight vehicle fleet in terms of emissions, noise and accident-related social costs, and investment requirements related to the future development of e-mobility.

In 2013, the 634 photovoltaic power plants installed along the Italian motorway network produced 14 244 MWh of electricity, corresponding to 7 610 tonnes/year in avoided CO_2 emissions.

Considerable investment activity is focused on construction of major highways in the Region:

- Bar-Boljare in Montenegro;
- further highway construction in Croatia;
- Corridors X and XI in Serbia;
- the Coast-Kosovo link in Albania;
- eventual development of the coastal highway linking Croatia, Bosnia and Montenegro.

It is expected that construction activity will support GDP creation and employment in the construction industry in the short to medium term; however, **if the utilisation rate remains sluggish, new highways may turn into a significant burden on public finances, as already experienced in some countries.**

Highway construction activities in Serbia and Montenegro are supported by loans from China, Azerbaijan and IFIs, while Bosnia and Herzegovina and Croatia predominantly cooperate with IFIs (the EIB, EBRD and World Bank).

There has been **a considerable improvement in road safety in all the countries.** this is the result of improvements in roads, stricter speed controls and more comprehensive transport legislation followed by training and enforcement, as well as of the somewhat faster modernisation of the vehicle fleet prior to the 2008 economic crisis.

Until 2008, Greece was engaged in a major road construction programme that contributed to national employment and GDP through procurement of construction services and construction materials. However, whether operational roads contribute in practice to GDP formation remains to be seen.

2.2. Rail infrastructure

The Italian rail infrastructure[40] is quite capillary and consists of about 16 723 km of lines (24 278 km of track, including 1 350 km of high-speed track). There are 6 449 km of major lines, with high traffic density and high-quality infrastructure, including international axes and those connecting the main Italian cities; and 9 331 km of complementary lines, with lower levels of traffic density, which form the link mesh within each region and tightly interconnect the main lines. About 12 000 km of the railway lines are electrified, and some 9 000 are single-track; **the system ranks fifth among EU Member States for level of technological development. The Adriatic and Ionian side of the country is served by major lines only as far down as Bari (Puglia): there are almost no high-speed lines** and, generally speaking, rail infrastructure and service are less developed in the southern regions.

The entire network is structured and equipped in a way that allows the movement of freight trains of different transport operators, with more than 220 dedicated plants including some 40 intermodal centres between rail and road transport, railway stations for the loading and unloading of goods and feeder lines for direct connection with manufacturing plants. **On average freight transport is declining: it is characterised by weaknesses related to capacity deficit, particularly along the main international crossings, and to the poor rail infrastructure at the ports** (operations in ports account for about 30 % of the total cost of a train). In 2014 the national rail infrastructure carried a global traffic of 330 million tonnes/kilometre.

Infrastructure investment is mostly related to the **development of high-speed rail links**, something which **does not significantly involve the EUSAIR regions**; this fact, along with the scarce intermodal connection with ports, tends to limit both tourist and freight traffic with respect to regional potential.

The national network, including the train ferry service across in the Strait of Messina, is managed by Rete Ferroviaria Italiana S.p.A. (RFI; www.rfi.it), a public company owned by Ferrovie dello Stato Italiane S.p.A. (www.fsitaliane.it)[41], which also owns Italferr S.p.A. (www.italferr.it), a leading railway engineering company with international activities also in the **Balkan area.** Their activities include the recent revision of the **Serbian Railways Strategy 2012-2021** and the preparation of the related Investment Plan 2012-2016 for the modernisation of the railway network (1 183 km), a project funded by the European Investment Bank.

[40] Unless otherwise specified, the main sources of the data that follow are RFI, the Italian state-owned company which manages the rail network infrastructure, and the annual statistical report published by the Italian statistical institute ISTAT.

[41] This is the biggest rail operator in Italy, which itself is state-owned and operates under concession. Ferrovie dello Stato Italiane also controls 59.99 % of Grandi Stazioni S.p.A. (www.grandistazioni.it), the company managing the 13 major Italian railway stations, as well as 59.99% of Centostazioni S.p.A. (www.centostazioni.it), which is responsible for the managing and reorganisation of 103 medium-sized stations.

As far as **transport services** are concerned, the main passenger operator is Trenitalia S.p.A. (www.trenitalia.it), which is 100 % owned by Ferrovie dello Stato Italiane. There are also a number of regional operators, and recently a new national passenger transport company, Nuovo Trasporto Viaggiatori (NTV; www.ntvspa.it) started operating along high-speed lines, with a service branded 'Italo'.

RFI is increasingly pursuing the reduction of the environmental impact of rail transport through the improvement of the efficiency of rail services, the adoption of an effective Environmental Management System and life-cycle assessments, the use of renewable energy sources and greater energy efficiency and reduction of consumption through technological innovation and organisational policies. Its network development plans also address the issues of the safeguard, maintenance, restoration and redevelopment of the territory and biodiversity, and it is also trying to raise the environmental awareness of key external stakeholders through specific communication campaigns.

The Balkan railway system is oriented towards connecting the Adriatic coast with the Danube region (see also Annex 3). Most of the rail lines are electrified and allow the efficient crossing of the Dinaric mountains. However, after years of political turmoil, rail infrastructure is devastated and average speeds and availability of rolling stock are limited.

Countries are now in the process of unbundling and liberalisation of railway markets. The intention of these reforms is to align the sector with EU rules and regulations, provide third-party access to fix infrastructure, and increase the utilisation of available infrastructure. **The growth in utilisation rates in Croatia (where reforms are well advanced) provides an interesting example.** All major international container operators are now present in Croatia with their operations with local rail companies. The increase in rail utilisation is grounded in a significant increase in container traffic in the major port of Rijeka[42].

Railways in Serbia, Montenegro and Bosnia and Herzegovina are still constrained by public support for road transport and construction of new highways, as well as lack of inland intermodal and container terminals. **There is also a lack of integration between railways and airports across the AIR** (with the exception of Athens airport).

The government of Serbia and the city of Belgrade recently announced construction of the first intermodal/container terminal linked with the rail infrastructure. However, that terminal is located away from the (current and probably future) Belgrade Danube port and, specifically, away from potential river-to-sea shipping facilities serving activities from Belgrade towards the Black Sea and Ukraine/the Russian Federation/Central Asia. This solution may deprive railways and ports in the AIR from growth potential stemming from these distant markets.

In Greece, railways have been enhanced by investments made prior to the financial crisis. **This supports mobility inside Greece, while integration with the rest of the Balkans remains relatively limited.** The first trains operated by Chinese operators, leaving from the port of Athens towards central Europe, crossed Serbia in the first months of 2015. These trains are double-decker and are highly efficient. This signals **strong competition potential between the port of Piraeus and the Adriatic ports**, with regard to central European destinations.

There is a significant difference between Balkan and Italian railways in terms of last mile integration[43] with ports, terminals and airports: while Italian railways are well integrated, there is minimal integration on the Balkan side of the AIR (with the notable exception of rail integration in the cases of Athens airport and Greek seaports).

[42] Author interviews with operators in the port of Rijeka.

[43] This refers to the portion of networks that physically reaches end-users/customers: also supported under the Connecting Europe Facility.

2.3. Maritime infrastructure

Maritime infrastructure in the Region is very much focused to ports. **It is tradition in this Region for ports/cities to have a significant degree of autonomy from the hinterland.** In many cases, ports are separated from their hinterland by mountains or are a long way from inland urban areas. Unlike in the rest of Europe where ports are interfaces between their home country and international markets, ports in the AIR exhibit a high degree of independence from their hinterlands. Ports are involved in international trade and transit tourism. However, **most ports lack economies of scale and remain more involved in transit trade than sea-to-inland trade.** Against this backdrop, this chapter will focus on ports rather than countries, even where particular ports belong to national jurisdictions.

Some large ports in the AIR are located on the **eastern shore of the Adriatic,** and are important for both freight and passenger transport (Koper in Slovenia; Rijeka, Split, Zadar, Ploce and Dubrovnik in Croatia; Durrës in Albania; Kotor and Bar in Montenegro).

The **port of Piraeus** serving the city of Athens is more oriented to seaborne trade than to the internal Greek market. It serves as a hub for trade between other Adriatic ports and ocean-borne trade and emerges as a critical transport link for the AIR even if it is not (strictly speaking) part of the Adriatic or Ionian sea. It contributes to Greek GDP through the volume and value of the services it provides to international markets, but does not really link the rest of the Greek economy to international markets in the way northern European ports serve their national markets.

Koper (Slovenia), Venice (Italy) and Trieste (Italy) are somewhat more integrated into central European markets and fit into the Adriatic–Baltic corridor[44]. However, the share of trade via these ports in the overall trade of central Europe remains limited, and this is reflected in significant throughput growth rates. These ports now face competition from the port of Rijeka (Croatia), whose development plans are aimed at increasing its market share in central European/Mediterranean trade.

Ports in Montenegro and Albania (and **other Italian ports on the Adriatic**) remain notably small in comparison with the above-mentioned strategic ports and their development. Serbia is a landlocked country, but its **Danube ports** and rail infrastructure are critical for the further growth of ports in Slovenia, Croatia, Montenegro, Albania and Greece, since these infrastructure connections may provide appropriate access toward central Europe and the Black Sea.

There are no maritime ports in **Bosnia and Herzegovina** today; however, there are plans for the construction of a port at Neum. Moreover, under the network of Marine Protected Areas in the Mediterranean (MedPAN) there are at present no such areas in the country. Potential areas were, however, under discussion at the time of writing of this study. The main access route to **Montenegro** for both goods and passengers is represented by the Port of Bar, which is located in a strategic position at the entrance to the Adriatic.

Ports in the AIR can be clustered into three groups: fuel and bulk cargo ports, container ports, and passenger ports. They could also be grouped on the basis of geographic coverage, into northern Adriatic ports, mid-Adriatic ports and Greek ports. The general trend is one of falling volumes of fuel and bulk cargo transport but increasing container throughput and rising passenger visits. **The growth in container transport is the most significant trend, supported by the increase in numbers of container ships, numbers of regular container lines and unit size of container ships visiting ports in the AIR.**

Italy, including its islands, has about 7 500 km of coastline of various typologies (in terms of predominant substrate, slope, tidal regime, etc.), of which about 800 km correspond to

[44] http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/bal-adr_en.htm

the Adriatic coast. The country also has a natural maritime vocation representing a significant part of national social-economic structure: the Italian maritime sector produces 2.7 % of GDP (EUR 39.5 billion, 9.7 billion of which in exported goods representing 3.3 % of national exports), accounts for more than 4 % of total investments and employs about 500 000 people. Moreover, **the Italian maritime sector is a worldwide market leader in passenger shipbuilding and mega-yacht delivery, and owns one of the youngest merchant fleets in the world.**

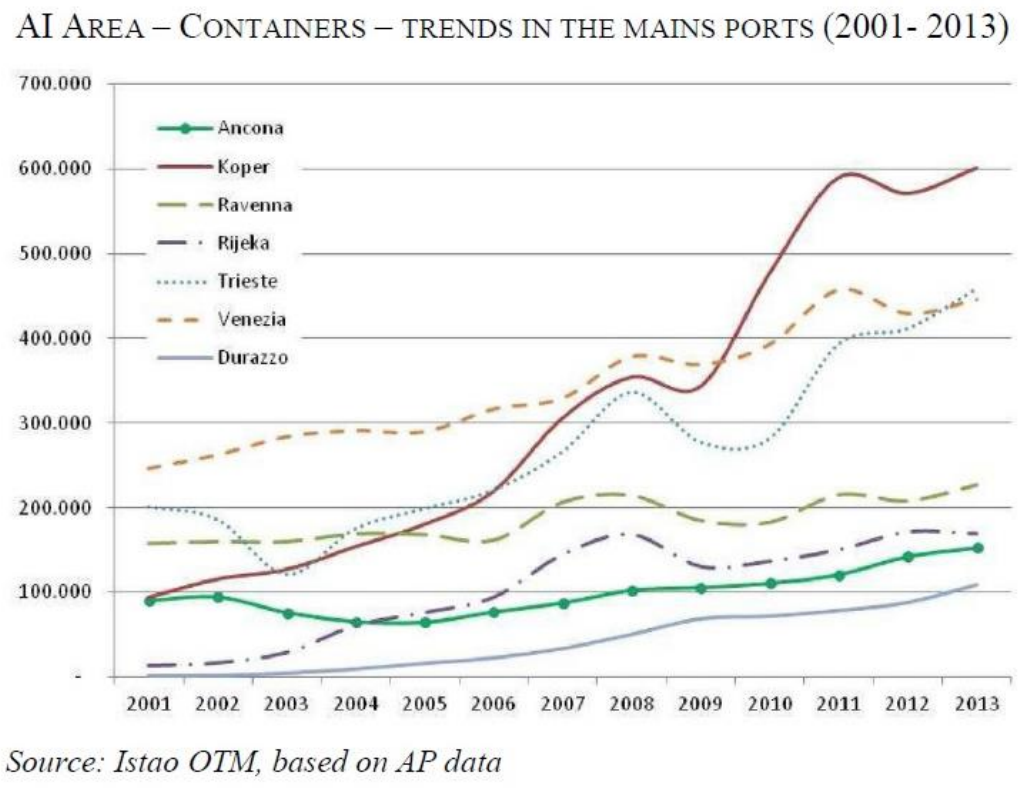
In 2013, the **Italian port system**, despite the significant loss of competitiveness experienced over the last decade in comparison to its main European and Mediterranean competitors, **was still an important access gate for commercial flows from and to Europe**, both for those from east to west (about 13 % of total continental maritime traffic) and those related to interchange with the emerging economies of north Africa, being in third place (over 11 % in terms of tonnes) after the UK and the Netherlands in terms of market share of maritime traffic handled. Italian ports are very different in terms of operational dimension, degree of product specialisation and performance: alongside the major ports, which tend to handle large volumes of diverse types of load, there are numerous medium to small ports which have achieved high rankings in specific business segments. Overall, the **port sector is characterised by a high degree of concentration,** with the top 5 ports (Genoa, Trieste, Taranto, Cagliari and Livorno) managing about 43 % of total traffic. Only a small number of ports have international importance, and numerous Italian ports redistribute to their local areas. In the container business, Gioia Tauro, Taranto and Cagliari are mainly devoted to transhipment.

From the point of view of coastal infrastructure and sea traffic, **the western Adriatic includes some of the main Italian ports**, in terms of both goods traffic and passengers transit (Trieste, Venice, Ravenna, Ancona, Bari, Brindisi and Taranto). **The quadrilateral formed by the ports of Bari, Brindisi, Lecce and Taranto plays a strategic role in the connection with the Ionian coast** and, hence, the 'meridian corridor' across the Mediterranean from Gibraltar to Turkey and the Black Sea. Growth in the cruise segment highlights the attractiveness of the Adriatic and the Mediterranean.

The movement of passengers in the AIR area is related in large part to the cruise market and ferries. After years of intense growth, movements are now showing a substantial decrease, particularly to and from Albania: -4.8 % of passengers and -2.8 % for heavy goods vehicles - and Montenegro. The Croatian market is the only one in the AIR in which passenger movement increased in 2010: +11.8 %, by comparison with zero growth in 2009 and -5 % in 2008. Ancona, on the Italian side, and Split, on the Croatian side, exhibited a real boom in movements: +20.3 % and +33.8 % respectively. The Bari-Dubrovnik connection gave very positive results, probably due to the growing flows of religious tourists to Medjugorje.

The following chart depicts the evolution of container transit in a number of major ports of the AIR.

Figure 9: Container transit in major AIR ports



Source: ISTAO OTM[45], based on Port Authority data

Container trade is motivated by strong competitive advantage over the north Atlantic route towards destinations in central Europe, as well as availability of rail and inland waterway transport capacity due to underutilisation of existing infrastructure. These competitive advantages are slowly outpacing the strong economy of scale advantages of the north Atlantic ports. The latter's competitiveness in central Europe is limited by long and heavily loaded railway lines and the limitations of the Rhine–Main–Danube canal (which comprises over 100 locks to extend vessels with cargo to a 405m altitude and limits the size and speed of vessels). At present, the Rhine–Main navigation system is governed by modern European inland waterway regulations that allow optimal use of vessels. By contrast, **navigation of the Danube is governed by the obsolete Danube Convention (1946)**, which limits the optimal use of fleet and navigation rights.

As a consequence, **navigation of the Danube, which could become a major redistribution facility for cargo from Adriatic-Ionian ports towards central Europe and the Black Sea, is as things stand limited in scope and volume.** This limits potential off-take for cargo from Adriatic ports and utilisation of throughput capacity. Transport linkages between the Adriatic–Ionian and Danube regions and demand for transport services from Danube region are critical for the provision of economies of scale for the Adriatic–Ionian ports.

[45] Istituto Adriano Olivetti (ISTAO), Osservatorio Sui Trasporti Marittimi (OTM).

Box: Container traffic from Piraeus

On 28 April 2014 the first container train from the port of Piraeus crossed Serbia on its way to the Czech Republic. It crossed Serbia in 14.5 hours, or 5.5 hours ahead of the regular time for cargo trains, and was the first of a number of trains. The transport was organized by COSCO, a Chinese company which is a new operator at the port of Piraeus. COSCO operates over 3 million containers per year from Piraeus, which is the third largest container port hub in the Mediterranean and has plans to double its capacity and become the largest. It discharges containers to the Adriatic (directly to the port of Rijeka) and by rail, via Belgrade, to the Czech Republic (See: http://www.rne.eu/rail-freight-corridors-rfcs.html)

This process is already gaining the attention of competing ports from the north Atlantic coast.
(See: http://www.clingendael.nl/sites/default/files/2014%20-%20Chinese%20investment%20in%20Piraeus%20-%20Clingendael%20Report.pdf)

In addition, growth at the Piraeus hub is facilitating a massive increase in traffic via the ports of the northern Adriatic (See: http://www.portsofnapa.com/)

It is expected that other container operators will follow suit and offer more regular feeder services to the Adriatic.

The advantage accruing to the Adriatic ports in serving central Europe could be demonstrated by the comparative distance for shipping from Shanghai (China) to Rijeka (Croatia), i.e. 9 741 nautical miles, while the shipping distance from Shanghai to the port of Hamburg (Germany) is 12 277 nautical miles. Once the geographical advantages of the Adriatic–Ionian route are backed up by a significant scale and volume of transport, the combination will lead to lower unit transport costs, reduce congestion on major European railways and decrease transport and energy costs, as well as CO_2 emissions from transport.

At the time of writing of this study, most of the growing container transport was intended for end-users outside the AIR, notably in central or even western Europe. Within the AIR, inland intermodal services are still rudimentary and are intended to serve small and only slowly growing domestic demand.

In the Adriatic few ports are equipped with real rear ports, Trieste (Fernetti and Cervignano) and Rijeka (Skrijevo) being exceptions in this respect. **All ports, especially those handling large flows of goods, are investing in intermodal transport.** Most of the initiatives planned by the port authorities across the AIR aim at increasing the capacity of port infrastructure, creating platforms that can handle intermodal traffic, or at increasing the number of tracks or creating smoother connections to the national network. This is also necessary due to the fact that one of the historical gaps in the Mediterranean ports, and in the Adriatic in particular, is the **lack of land rail connections to and from the ports**. This represents a great difference from the situation of the ports in northern Europe, where train connections are very well developed and can connect directly to ports, inland terminals and major consumption areas. The real costs of railway traction are difficult to compare with the costs of road transport for a number of reasons, including the high investment costs of incoming and outgoing terminalisation, as well as charges related to road terminalisation.

On the eastern side, connections exist both from Koper and from Rijeka, the latter reaching 25 % of container traffic by rail. Ploce has several connections with Bosnia and Herzegovina, and Bar with Belgrade and Novi Sad.

It should be remembered that **accessibility of the whole area could be improved through implementation of the projects included in the TEN-T Network**[46]. This represents a strategic option for economic and social stabilisation in the Balkans and for improving relationships between Italy and the east European countries. In this context, **strong multilateral cooperation is the first concrete prerequisite** for the construction, improvement and technological modernisation of the transport infrastructure, as well as in the context of the need to improve existing logistics systems.

After the first years of the crisis, the year 2010 was characterised by a recovery in global container traffic. In the Adriatic-Ionian basin, overall growth was very modest (only 0.4 %) and highly differentiated between countries; however, if one considers only the Adriatic, excluding Taranto (where there was a decrease of -22 % due to the crisis of the steel industry, the major local economic activity), the ports showed a rise of 11 % in container traffic. The Italian ports, however, grew by only 3 %, in line with the weak recovery of the country in contrast to the rapid development of container traffic in the eastern Adriatic. The Slovenian port of Koper (which is an important access route between the Adriatic and Ionian highways and transportation routes in the corridor under the TEN-T networks) recorded a 39 % increase.

As we have seen in part above, over the last decade the northern Adriatic ports have had to face increasing competition from the north-eastern ports (Koper and Rijeka), which have benefited from development plans and important investments. To thrive in the face of strong competition from the North Sea ports and continue to play a key role in the central European markets, the **northern Adriatic ports must strengthen their cooperation, through regional coordination for a common promotion of traffic flows for the entire area and a sole gateway for the maritime trade in the North Adriatic, integrating the Italian ports with those of Koper and, in the near future, Rijeka.**

An increase in traffic along the Adriatic coast is also conceivable in relation to the implementation of the Baltic-Adriatic corridor[47] and especially in its extension to the south.

An **additional stress factor for the Adriatic basin consists of the exploration for and production of offshore oil** in numerous regions (e.g. Puglia, Abruzzo and Basilicata), since this is potentially harmful for the coastal areas and the protection of biodiversity. In the absence of a common sea-basin sustainable development policy including the promotion of intermodal transport and sustainable planning, the increase in maritime traffic, although a factor of economic growth, might look like an added disturbing factor for the precarious environmental balance, with increased pollution risks and human pressure on the coasts reaching breaking point.

The tables and figures in **Annex 3** illustrate respectively the evolution of passenger and freight traffic in the main Italian ports, showing, with regard to the Adriatic and Ionian ports, a steady rising trend for both forms of traffic.

[46] http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/index_en.htm

[47] See also: Connecting Europe Facility, Regulation (EU) No 1316/2013 of 11 December 2013 and http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/bal-adr_en.htm

Box: Motorways of the sea

In Italy 88 % of goods are transported by road, which has implications for safety and traffic congestion. The so-called 'Motorways of the Sea'[48] (MoS) represent the biggest opportunity in terms of transformation of freight mobility for a country with a very peculiar geographical configuration such as Italy, allowing lorry drivers to avoid traffic, excessive fatigue, pollution and wear-and-tear on their vehicles.

For a few years Italy took important steps to promote shipping routes through the introduction of incentive schemes (Ecobonus) to trucking companies and their associations, also leveraging on electronic equipment and information systems designed to optimise the transport chain in maximum safety conditions. Ecobonus, funded to the sum of EUR 77 million per annum in the period 2007-2009, made (on average) the cost of transport by sea less than half of the cost of transport on land and even lower than the cost of diesel.

In recent years there was a steady increase (about 20 % per year) in heavy traffic being transferred to sea routes: at present about 1.5 million trucks use the Motorways of the Sea each year, filling about 50 % of the total capacity of the overall system. A further increase of 50 % is therefore achievable without additional economic, social and environmental costs.

Rete Autostrade Mediterranee SpA (www.ramspa.it) is the national operating company which promotes, along with Regions, port authorities and private companies, the implementation of the National Programme of MoS in the Mediterranean basin. Its mission includes supporting and coordinating actions at European level in order to define the **Mediterranean MoS Master Plan**, dealing with the major structural and infrastructural problems that affect the development and evolution of demand for cargo and identifying priority improvement actions, in line with the TEN-T, with a view to developing the most attractive traffic flows and increasing the number of recipient ports. The Plan identified infrastructural needs, including ICT, to the sum of approximately EUR 1.12 billion, including 590 million for ports located in northern Italy and around 530 million for those in southern Italy.

In 2005, following the experience of the European Technology Platforms, Italy launched the **Italian Maritime Technology Platform** (**PTNM**) as the interface with EU WATERBORNE[49] initiative. PTNM involves all economic, scientific and institutional stakeholders related to the sea with an integrated and consistent approach to the maritime/marine sectors, covering the most important issues such as sustainability, professional development, quality, safety, innovation and competitiveness, in alignment with the European Commission strategy on Integrated Maritime Policy (Blue Book). In 2008 PTNM developed the **Italian Strategic Research Agenda** (**SRA-IT**), coherently with the European WATERBORNE SRA[50] and focusing on research and innovation topics of national as well as European/international interest.

[48] See also: http://ec.europa.eu/transport/modes/maritime/motorways_sea/
[49] http://www.waterborne-tp.org/
[50] http://www.emec.eu/docs/waterborne_sra_overview.pdf

2.4. Airport infrastructure

Italy has 47 commercial airports, one for every 1.27 million residents and for every 6 400 km^2, figures which, according to a 2010 strategic study carried out by KPMG and Nomisma[51] on behalf of the Civil Aviation Authority, are in line with those for other bigger European countries in relation to their population and territorial extension. Contrary to the average European situation, traffic is less concentrated at major airports (> 10 million passengers per year) and more distributed in medium-sized airports (< 5 million passengers per year).

The national index of propensity to fly (2.3 passengers/inhabitants) appears slightly less than the average of the bigger countries of western Europe (2.8), and with respect to overall levels of population and characteristics of settlement and economic development, air traffic is unevenly distributed in the country: 40 % in northern Italy, 40 % in central Italy and 20 % in southern Italy and the islands. Traffic in northern Italy is predominantly international (about 70 %), as is that in central Italy (about 65 %), while in southern Italy and the islands it is mostly national (73 %) and mainly concentrated on links with Rome and Milan.

The market level of air transport in Italy, compared to population and economic indexes, is still modest, and international traffic represents the segment in which Italy has the greatest growth potential.

According to the above-mentioned KPMG study, **the main weaknesses of the Italian airport system are:**

- fragmentation of commercial traffic;
- difficult accessibility, due to insufficient links: in many instances access time is reduced by reasons relating to local traffic or inadequate road systems;
- low level of intermodality, especially with rail, both locally and regionally (six airports are connected with the rail network, of which only one, Malpensa, with a high speed line): in all cases, travel times, frequency and the characteristics of trains discourage users and make rail links uncompetitive with roads;
- future risk of congestion and decay of the level of services caused by the delayed implementation of major modernisation investments;
- lack of available land for expansion;
- facilities significantly below European standards in terms of architectural and structural quality, plant equipment, technology and energy efficiency;
- lack of efficient national and regional planning;
- lack of adequate attention to the environmental issues, including energy efficiency and settlement pressure.

In the next two decades **a major challenge will be to enable Italian airports and related land areas to handle the expected doubling of passenger volumes by 2030 and the resulting satellite activities in terms of employment and GDP**. The actual development of the market will depend on the ability to balance the expected demand in terms of air carriers and air transport users with the deployment of a range of adequate airport infrastructures. No additional airports will be needed beyond those already programmed, provided ongoing or planned infrastructure adaptation and strengthening are implemented.

[51] One Works, KPMG, Nomisma (2010), Studio sullo sviluppo futuro della rete aeroportuale nazionale quale componente strategica dell'organizzazione infrastrutturale del territorio

The **National Plan for Airports**, jointly drawn up in 2012 by the Ministry of Infrastructures and Transport and the Civil Aviation Authority, is based on the following strategic lines:

- classification of airports integrated with the structure of the TEN-T European network, which includes 33 domestic airports;
- increase of airport capacity in existing airports in order to prevent future congestion and foster economic growth;
- safeguarding of the surroundings of airports to allow their necessary expansion;
- planning integrated with the local territory, also to stimulate synergies with public and private entities operating close to airports;
- long-term environmental sustainability of airports in compliance with national and European policies;
- development of rail connections to increase intermodality and support environmental policies;
- limiting the construction of new airports within the next two decades;
- no closure of existing airports with little traffic, but assessment of their economic sustainability without public resources but possibly involving private capital within integrated territorial development projects, and definition by the Civil Aviation Authority, jointly with regions and other entities and organisations, of simplified operational models for their sustainable management.

Large airports in the Region (Dubrovnik, Zagreb and Belgrade) are all planning or undertaking investments to increase capacity, effectiveness and safety. Investments in smaller airports (Nis, Podgorica, Tivat, Rijeka and others) are on a smaller scale. **No airport in the Western Balkans is directly integrated with the rail network** (and links are not envisaged), while **those of Belgrade and Zagreb are directly linked to major highways.** It is important to note that Belgrade, Zagreb, Podgorica, Nis, Split, Sarajevo and Thessaloniki airports are located in the proximity of rail infrastructure and that integration is still technically possible.

It is important to consider the relatively limited connectivity between airports and waterborne passenger transport in the entire Adriatic-Ionian region. As a consequence, the main cruising tourism flows originate from out the Adriatic (the Greek ports of Athens and Corfu), where integration with airports is better.

A range of airports along the Adriatic coast (Tirana, Podgorica, Tivat, Dubrovnik, Split, Zadar, Rijeka, Pula and Portoroz) effectively serve seasonal tourism demand related to local tourist markets. These airports are connected to their respective (or desired) tourist home countries, including the Russian Federation and countries in western and northern Europe.

2.5. Conclusions on transport

Transport systems are complex: roads, railways, ports and airports, inland, coastal and open sea waterways interact in multiple complex relationships. Critical bottlenecks and challenges have to be considered in the transport sector in the AIR, which is faced with a severe lack of competitiveness (which currently overrides its geographical advantages). Owing to the complexity of the transport sector (both negative and positive), the effects of these bottlenecks and challenges can multiply: persistent bottlenecks may cause massive underutilisation of transport assets, while effective remedies may spark a rapid and wide-ranging re-engagement with significant economic growth potential. Table 14 includes a non-exhaustive list of critical bottlenecks, challenges and perspectives.

Table 14: Interrelations among transport modes in the AIR

Transport mode	Bottlenecks	Challenges	Perspectives
Road	Inadequate integration between road transport and rail and waterborne transport modes	Massive ongoing investment in highways and their low utilisation rates may strain public finances	Taking into account distance from high GDP formation areas, further economic development in AIR will require a sharp fall in market share of road transport
Railway	Inadequate infrastructure support for double-decker railcars. No inland intermodal terminals	Growing demand for container transport may not find adequate rail services and may shift to road transport.	Growth in container transport requires development of double stack rail cars practice.
Waterborne	Lack of economy of scale to justify large-scale international container services. 1946 Danube Convention governs navigation on Danube and is an obstacle to competitive shipping services	Further development of large-scale international container service lines to the deep port of Rijeka. Appropriate economies of scale at AIR ports. Further development of Danube region, inland shipping and river-to-sea shipping at lower Danube in order to provide economies of scale at AIR ports	Growth in volume of container transport
Air	Inadequate integration between airports and rail infrastructure	Seasonal fluctuation of utilisation rates	Stronger integration with rail and water transport

Source: Author's analyses

3. Analysis of the Energy Sector

KEY FINDINGS

- The energy system is fragmented. Linkages between Italy and the Balkans and the Balkans and Central Europe/Black Sea area are too small in capacity or are underutilised.
- EU Member States are more energy-efficient than non-EU countries in the AIR. They also have lower carbon intensity of GDP. This weakness signals further risks for non-EU countries in a process of decarbonisation.
- Large parts of the energy industry across the AIR are losing their competitive position and are likely to fold. Oil refineries, lignite-fired power plants, district heating plants, oil terminals and pipelines are all at risk.
- Capacity markets are underdeveloped in the energy sector. In particular, transit capacity markets are not yet established in a commercial way.
- There is significant spread of and risk of a further rise in fuel poverty, which affects the use of available energy infrastructure. Fuel poverty risks are magnified by environmental impacts on health and land. Very little is being done to eradicate fuel poverty.
- Available hydro power resources in Balkans are strategic at the Europe market scale. These resources are severely underutilised for political and policy reasons. This issue emerges as a critical impediment to market integration between the Western Balkans, Greece and Italy as well as to the integration of the entire AIR area into the European market. The issue also spurs renewable energy potential in the whole of Europe.
- Security of natural gas supply is publicly discussed, together with proposed alternative sources of supply. However, little attention is paid to very low-efficiency and unsustainable gas use. Improvements in energy efficiency and use of renewable energy constitute the most effective remedy for problems related to security of supply.
- New gas supply may be required following development of commercially sound and sustainable demand.
- The list of Projects of Energy Community Interest (PECI) developed in the context of the Energy Community Treaty needs to be updated in order to reflect new commercial realities and distinguish private commercial projects from projects that require public funding.
- The need for private investment in energy is growing. Accession of all countries of the Balkan peninsula to the Energy Charter is a prerequisite for private investment and more comprehensive energy efficiency strategies.
- The tangible integration of Greece into the AIR is critical for its development. For this to be achieved, a new dimension in developing hydro power potential and water resources across the Balkan peninsula is needed, together with a far better integration of energy and transport infrastructures in the area.

Table 15 and 16 show respectively basic and complex energy indicators for AIR countries. It is indicative that Italy scores close to the OECD average in almost all qualitative complex energy indicators related to GDP, while Croatia and Slovenia score between the OECD and world averages, reflecting **the relative position of former Yugoslavia, which used to be an observer country within the International Energy Agency** (**IEA**) **and maintained a relatively resilient energy sector.** Albania is something of a special case thanks to its relatively underdeveloped energy system that relies on hydro power and fuel wood.

Table 15: Basic Energy Indicators (2012)

Region/ Country/ Economy	Population	GDP	GDP (PPP)	Energy prod.	Net Imports	TPES	ELEC Cons.[a]	ELEC Emissions.[b]
	million	billion 2005 USD	billion 2005 USD	Mtoe	Mtoe	Mtoe	TWh	Mt Of CO_2
World	7 037	54 588	82 901	13 461	-	13 371[c]	20 915	31 734[d]
OECD	1 254	39 490	39 202	3 869	1 543	5 250	10 145	12 146
Albania	3.16	11.22	25.69	1.67	0.39	2.07	6.14	3.83
Bosnia and Herzegovina	3.83	12.88	28.20	4.52	2.21	6.67	12.54	21.22
Croatia	4.27	44.95	68.29	3.45	4.39	7.92	16.30	17.19
Greece	11.09	208.22	234.49	10.43	19.44	26.55	61.13	77.51
Italy	60.91	1729.86	1605.06	31.86	132.60	158.80	321.38	374.77
Montenegro	0.62	2.88	6.59	0.71	0.37	1.06	3.36	2.30
Serbia	7.22	27.85	69.95	10.78	3.98	14.46	31.58	44.09
Slovenia	2.06	38.25	50.29	3.56	3.64	7.00	13.94	14.63

[a] Gross production + imports – exports - losses.
[b] CO_2 emissions form fuel combustion only. Emissions are calculated using the IEA's energy balances and the Revised 1996 IPPCC Guidelines.
[c] TPES for world includes international aviation and international marine bunkers as well as electricity and heat trade.
[d] CO_2 emissions for world include emissions from international aviation and international marine bunkers.
TPES = Total Primary Energy Supply

Source: IEA (2013)

Table 16: Complex Energy Indicators (2012)

Region/ Country/ Economy	TPES/ Pop.	TPES/ GDP	TPES/ GDP (PPP)	Elec. cons/ pop.	CO_2/ TPES	CO_2/ pop.	CO_2/ GDP	CO_2/ GDP (PPP)
	toe/ capita	toe/000 2005 USD	toe/000 2005 USD	kWh/ capita	t CO_2/ toe	t CO_2/ capita	kg CO_2/ 2005 USD	kg CO_2/ 2005 USD
World	1.90	0.24	0.16	2 972	2.37	4.51	0.58	0.38
OECD	4.19	0.13	0.13	8 089	2.31	9.68	0.31	0.31
Albania	0.66	0.18	0.08	1 943	1.84	1.21	0.34	0.15
Bosnia and Herzegovina	1.74	0.52	0.24	3 271	3.18	5.54	1.65	0.75
Croatia	1.85	0.18	0.12	3 819	2.17	4.03	0.38	0.25
Greece	2.39	0.13	0.11	5 511	2.92	6.99	0.37	0.33
Italy	2.61	0.09	0.10	5 277	2.36	6.15	0.22	0.23
Montenegro	1.71	0.37	0.16	5 412	2.16	3.70	0.80	0.35
Serbia	2.00	0.52	0.21	4 371	3.05	6.10	1.58	0.63
Slovenia	3.40	0.18	0.14	6 778	2.09	7.11	0.38	0.29

Source: IEA (2013)

In mid-October 2013, the European Commission submitted a first final list of 248 infrastructure projects (or Projects of Common Interest - PCIs) for the construction of an integrated energy market in Europe, allocating EUR 5.85 billion for the period 2014-2020. In addition to the implementation of a **Trans-European Energy Network** (**TEN-E**), the Connecting Europe Facility (CEF) aims at increasing the investment inflow in the European energy sector, reducing energy prices and, especially in a geostrategic perspective, strengthening the EU's ability to diversify energy supply and, consequently, make the entire energy network more cohesive, safe and responsive to the instability inherent in the global energy market or to political or environmental interference factors.

In the context of the **Energy Community Treaty**, a first **energy strategy for the Western Balkans region** has been developed, including a list of **Projects of Energy Community Interest** (**PECIs**) (see Annex 3). Local civil organisations, interest in academic circles and new market circumstances all point to the need for that strategy and the PECI list to evolve toward more appropriate solutions and projects that will better serve local economic development. Unlike the above-mentioned PCIs, the PECI list comprises power generation projects that should be a matter of commercial competition. Most importantly, all countries in the region are invited to join[52] the EU in developing strategies

[52] The Energy Community Treaty is likely to be extended to include the EU carbon pricing scheme (ETS), while countries are now obliged to produce their respective Intended Nationally Determined Contribution (INDC)

that are more resilient to **climate change** and adopt mandatory targets to limit climate change impacts. Taking into account the **very high carbon intensity of GDP in the AIR (with the exception of Italy)**, **decarbonisation of the energy and transport sectors emerges as a prerequisite for further integration into European energy and transport markets**. A number of recent studies indicate[53] that the AIR is very well endowed with renewable energy resources which, contrasted to low density of population and economic activity and characterised by massive energy efficiency potential, provide interesting opportunities for investment. These large-scale opportunities are not yet reflected in the Western Balkan energy strategies and lists of priority projects.

3.1. Electricity infrastructure

According to Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009, **ENTSO-E**, the European network of managers of transmission systems, adopts and publish every two years, through a process of consultation, a non-binding Ten Year Network Development Plan (TYNDP) at Community level[54], based on national and regional investment plans and taking into account the guidelines for the Trans-European networks in the energy sector (**TEN-E**). It includes models of the integrated network, the development of scenarios and forecasts on the adequacy of supply and demand in Europe, also identifying the investment needs related to cross-border capacity and any obstacles caused, e.g. by permit procedures. Network operators cooperate at regional level to contribute to the adoption of investment plans. A significant project for regional cooperation and integration of electricity markets is that for **undersea HVDC cables across the Adriatic and Ionian seas** (see Map 17).

The electrification level of Italy is generally very good, with some remaining generation and transmission/distribution issues for remote islands having been recently addressed with distributed generation solutions. The Italian energy market, including electricity and gas, is regulated by the national authority AEEG (www.autorita.energia.it).The liberalisation of the Italian electricity market, in terms of production, import, export, purchase and sale, was decreed in 1999 with Decree 79/99, following Directive 96/92/EC[55], while the activities of transmission and dispatching are still reserved to the state and granted in concession to the listed company Terna S.p.A (www.terna.it), which manages the **National Transmission Network**.

Since then the number of operators on the Italian electricity market has grown continuously, and by the end of 2013 the number of operators stood at 3 734 (3 226 electricity market operators, 508 self-producers[56] and 151 distributors). In the period 2011-2013 growth accelerated markedly, mainly thanks to renewables, at an average rate of 26.6 % per annum.

According to the most recent (2014) medium to long-term demand forecasting document (produced by TERNA S.p.A.), **within the next ten years** global electricity consumption will lie most probably between a -0.5 %/year decrease baseline scenario, related to a relatively stable market and a significant **exploitation of the energy efficiency potential**, and a development scenario characterised by a 1.0 %/year (CAGR[57]) growth rate.

towards the UNFCCC Paris Conference to be held in December 2015. See: http://ec.europa.eu/priorities/energy-union/docs/paris_en.pdf

53 http://better-project.net/sites/default/files/D4.2%20Future%20Prospects%20for%20Renewable%20Energy%20sources%20in%20the%20West%20Balkan%20countries_0.pdf

54 https://www.entsoe.eu/about-entso-e/system-development/ten-year-network-development-plan/Pages/default.aspx

55 Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity

56 Self-producers are defined by Decree 79/99 as using not less than 70 % of the electricity they produce yearly, either directly or through subsidiaries, controlled companies or consortia.

57 Compound Annual Growth Rate

More than 70 % of electricity is sold on the free market, while the remaining part represents the so-called 'protected market', which mainly concerns domestic and SME users benefiting from tariffs defined by AEEG.

In 2013 the net demand for electricity amounted to 318.5 billion kWh (-3 % compared to 2012), reaching a level comparable to 2003; during the last 10 years national consumption of electricity has been stable, ranging from 67 to 69 Mtep. **In 2011 Italy produced 2.3 % of the world's electricity**, through a total installed capacity of 122.3 GW, broken down as follows (in GW): 79.7 thermal (0.8 geothermal) power, 22.1 hydropower, 6.9 wind power and 12.8 photovoltaic (PV) solar power. **Italy has for many years been a net importer of electricity** (more than 13 % in 2015), mainly from France and Switzerland.

The Italian distribution network amounts to about 1.23 million km; the number of electricity distributors has steadily fallen from 173 in 2004 to 140 in 2012. Of the latter, 7 account for about 85 % of total consumption.[58]

In 2013 gross electricity production amounted to 289 803 GWh, of which 183 203 GWh from thermal power (including 5 659 of geothermal), 54 044 from hydropower, 14 897 from wind and 21 588 from photovoltaic power plants. Table 39 in Annex 3 illustrates the composition of production (GWh) in each region included in the Adriatic-Ionian area, showing **a general preponderance of 'traditional' generation (thermal and hydro) in the northern regions and of 'modern' renewable sources (wind and solar) in the south.**

The main producers and related overall electricity production percentages are:

Table 17: Main Italian electricity producers

Company	% of production
ENEL	25.45 %
Eni	9.48 %
Edison	7.17 %
E.ON	4.37 %
Edipower	3.86 %
GDF Suez	3.56 %
A2A	3.18 %
Tirreno Power	3.11 %
ERG	2.86 %
IREN	2.19 %
Others	34.76 %

Source: Terna S.p.A. (2014)

Renewable energy sources (RESs) currently play a leading role within the Italian energy system, their growth having been strongly accelerated since 2006 by the launch of the first feed-in tariffs system for photovoltaic power plants. A document recently published by the Italian state-owned company Gestore Servizi Energetici (GSE)[59], reported that in 2013 16.7 % (20.7 Mtoe[60]) of total energy consumption in Italy derived from renewable sources, (51 % related to heat, 43 % to electricity and 6 % to transport): **the overall increase (1.1 Mtoe) as compared with 2012 was 5.7 %, despite the phasing-out of incentives for solar energy.**

[58] ENEL S.p.A. (www.enel.it) is by far the largest, with more than 75 % of distribution in terms of GWh and some 32 million usage points. It is followed by A2A (3.45 %; www.a2a.eu) and ACEA (2.88 %; www.acea.it).

[59] GSE is in charge of the general supervision and promotion of renewables and energy efficiency, including the trading of the produced energy and the administration of related incentives. See: www.gse.it

[60] Applying the accounting criteria under Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

As far as the electricity sector is concerned, by the end of 2013 there were about 600 000 RES plants installed, with a total capacity of about 50 000 MW and a yearly production of about 103.3 TWh (8.9 Mtoe). Hydroelectric energy, which historically represents the very first electricity source in the country, provided the most significant contribution (44 %), followed by solar (21 %), biomass (16 %), wind (14 %) and geothermal (6 %).

In 2013 about 10.6 Mtoe of thermal energy were produced from renewable sources (444 000 TJ), of which 9.8 Mtoe directly (through stoves, fireplaces, solar panels, heat pumps and geothermal systems) and 0.8 Mtoe as consumption of heat as a byproduct (mainly through district heating systems fuelled by biomass): the main source was solid biomass (7.8 Mtoe), used mainly in the domestic sector (6.7 Mtoe); heat pumps contributed significantly (2.5 Mtoe), while the exploitation of geothermal and solar energy was still limited. In the transport sector 1.25 Mtoe (over 1.4 million tonnes) of biofuels were consumed, mainly in the form of biodiesel (94 %).

The 2014 edition of the **Italian Electricity Transmission Network Development Plan** envisages investments to a total amount of EUR 8.1 billion, of which 5.6 billion euro in the next 10 years, aimed at:

- reducing energy losses of 1.1 billion kilowatt-hours per year;
- reducing CO_2 emissions by about 13 million tonnes/year;
- reducing congestion by over 5 000 MW;
- increasing interconnectivity with foreign countries by about 5 000 MW;
- increasing capacity from renewable sources by over 6 000 MW.

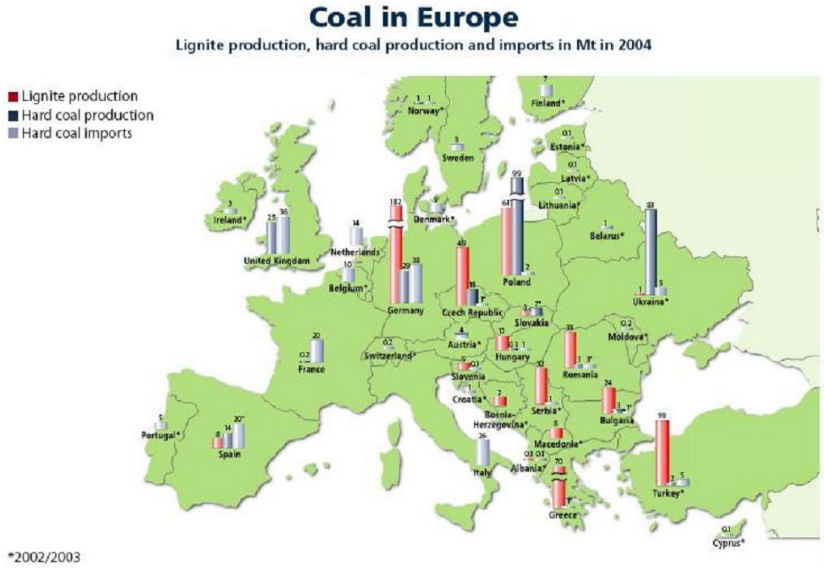
Major construction works are ongoing amounting to EUR 2.7 billion, including new interconnections with France and Montenegro, a new 380 kV line between Sicily and Calabria, rationalisation in a number of metropolitan areas such as Milan and Palermo, and distributed energy storage systems in Puglia. Investments submitted for authorisation (at the time of writing of this study) amounted to EUR 1.8 billion, **and in the Adriatic area included a few 380 kV lines, one between Abruzzo and Puglia, two in Sicily and one in Puglia.**

In Italy there is a wholesale electricity marketplace, articulated in three different markets and managed by GME S.p.A[61], which is also entrusted with the organisation of trading in green certificates (certifying the generation of energy from renewable sources) and 'white (energy efficiency) certificates' (attesting to the implementation of policies to reduce energy consumption).

The use of solid fuels is a significant difference between Italy and the Balkan peninsula: Slovenia, Serbia, Bosnia and Herzegovina, Montenegro and Greece are well endowed with low-quality coal (lignite) resources. Combined lignite production in these countries is well over 100 million tonnes per year, and lignite provides over half of electricity currently produced in those countries.

[61] Gestore Mercati Energetici; www.mercatoelettrico.org

Map 4: Use of solid fuels for power generation



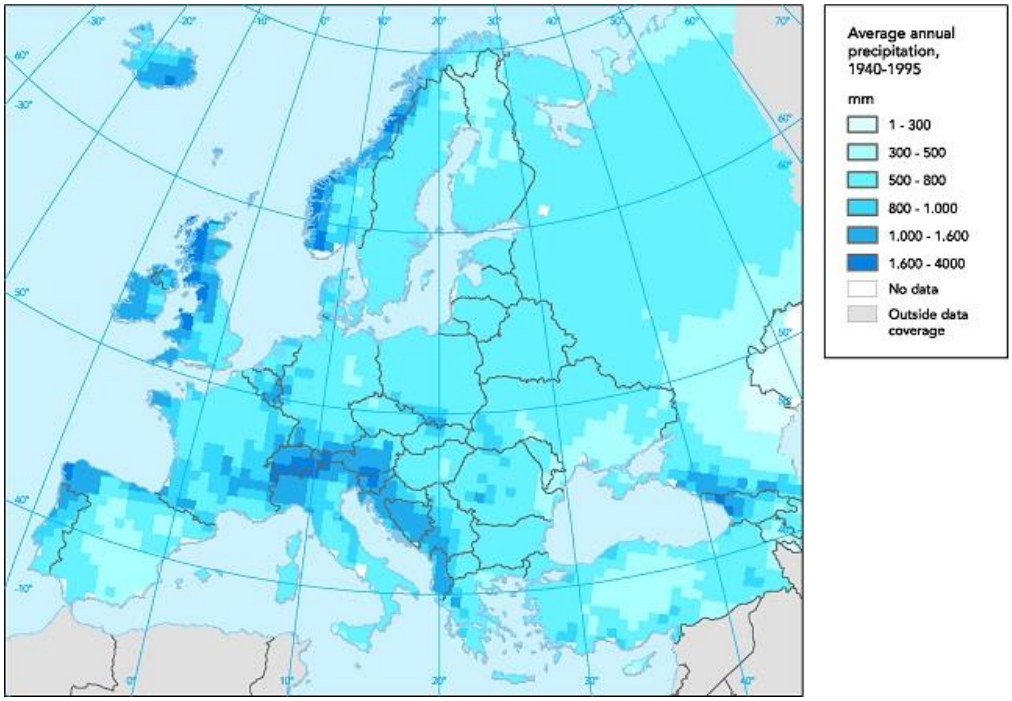
Source: EuroCoal

Lignite extraction is an exceptionally low-productivity process in the countries concerned: available lignite resources are scattered and of relatively low quality, not suitable in many cases for industrial-scale continuous extraction technologies. Extracted lignite has much lower calorific value than internationally traded hard coal.

Finally, limited resources and low density of energy demand facilitate substandard power plant size, low combustion efficiency (in comparison with other major lignite industries in Europe), difficult environmental impacts and lower capital returns. The relative inefficiency of this process and its relative size within the national economy result in a **productivity gap** that is difficult to overcome in a situation where industries remain relatively uncompetitive. That partly explains the significantly higher Global Competitiveness Index rank of Italy (see Table 3) versus other countries in the AIR, as well as its strong competitive position in qualitative energy indicators.

In the western Balkans, **very high annual precipitation** is associated with the high altitudes of Dynaric Alps. Thanks to the north-west to south-east orientation of these mountains (running parallel with the eastern Adriatic coast on one side and the Sava and Danube rivers on the other), water inflow is distributed to the Adriatic and Danube catchment area. The Adriatic catchment, which has a number of rivers, is suitable for large-scale hydropower development by reason of a high density of hydro energy (high head/high water flow).

Map 5: Annual precipitation in Europe



Source: http://www.eea.europa.eu/data-and-maps/figures/average-annual-precipitation

During the period from the 1950s to the 1990s **a number of large hydro power plants with large accumulation lakes were built to harness this massive inflow of hydro energy.** During the same period, massive irrigation works in northern Serbia were completed to accompany the development of the Iron Gates hydro power plant on the Danube. **Some of the largest and most effective hydropower arrangements in Europe are located in this region, including:** the Iron Gates hydropower system, which is the largest hydro power plant and accumulation lake in Europe (except for the former Soviet Union), and the Bajina Basta hydro power system with the world's largest reversible hydro turbines, etc. Accumulation lakes are typically sized to capture seasonal water inflow and regulate floods. **Such large dams also create complex environmental hazards.** Former Yugoslavia made a significant contribution to the stability and flexibility of the European electricity grid.

The disintegration of Yugoslavia turned all these resources into **cross-border hydro resources.** All the hydropower plants are, in one way or another, associated with cross-border water flow. This has given rise to complex disputes at almost all borders in the Western Balkans, necessitating dedicated international attention and assistance. **In many cases, cross-border disputes hinder the optimal use of resources.** A part of peak power capacity is lost thanks to these disputes. The remaining part is reoriented to serve inefficient domestic demand, i.e. there is a shift from baseload industrial demand to variable residential demand.

Map 6 demonstrates the location of major hydropower installations and borders across the AIR.

Map 6: Electricity infrastructure of the Western Balkans region

The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.

Source: IEA (2008)

Residential demand is correlated with heating and air-conditioning requirements and motivated by fuel shifts during cold periods. This creates massive demand spikes that, in turn, cause spikes in network losses and magnify the need for peak supply. Also closely linked are fuel poverty and security of supply, in relation to district heating and natural gas. As a consequence, the most valuable natural resources and energy assets are directed to serve the least economical demand. The European electricity market is deprived of one of its most valuable flexible power generation resources and of its ability to deploy more intermittent renewable energy (wind or solar) at lower cost.

This problem is visible in the electricity trading potential between Italy and Greece on the one hand and the Western Balkans on the other: Italy and Greece have significant renewable energy potential (wind and solar) and significant summer demand. The Western Balkans area has a hydro potential that could (if properly used) balance intermittency of wind and solar power generation, while most peak demand in the area falls in the winter period. These opportunities are mostly on hold, for political, social and policy reasons as discussed above. The European Union Strategy for the Adriatic and Ionian Region appears as an interesting framework to tackle these problems and opportunities.

3.2. Gas infrastructure[62]

Oil and gas fields belong to the state in Italy and are granted on a concessionary basis to qualified private companies[63]. In 2014, national production of natural gas stood at 7.28 billion scm[64] (4.83 scm from the regions of the Adriatic/Ionian area, 30 % of which from Basilicata); 2.42 scm came from the 118 onshore concessions and 4.86 scm from their 69 offshore counterparts.

Imports represent the greater part of Italy's gas balance, with dependence on foreign supplies steadily growing over the last 20 years. In 2014 total gas imports amounted to 55.36 billion scm.

The Italian gas infrastructure consists of the transport/dispatching network and its points of international interconnection and the distribution networks, as well as storage and liquefied natural gas (LNG) re-gasification terminals.

The importing process takes place through **international pipelines** connecting to the National Gas Pipelines Network:

- TAG (operated by Trans Austria Gasleitung GmbH), for the import of gas from Russia, with a maximum daily capacity of 59 million cubic metres, crossing Austria near the border with Slovakia and connecting in Tarvisio (Friuli-Venezia Giulia);
- TRANSITGAS (operated by Transitgas AG), importing Dutch and Norwegian gas through the TENP pipeline, with a maximum daily capacity of 107 million cubic metres, connecting at Passo Gries, close to Switzerland;
- TMPC (operated by Transmediterranean Pipeline Company), with a maximum daily capacity of 99 million cubic metres, connecting the border between Algeria and Tunisia across the Sicilian Channel with Mazara del Vallo;
- GREENSTREAM (operated by GreenStream B.V.) between Libya and Gela (Sicilia), with a maximum daily capacity of 31.6 million cubic metres;

Re-gasification terminals for shipped LNG can be found in:

- Panigaglia (Liguria), managed by GNL Italia, with a maximum daily capacity of 13 million cubic metres;
- Rovigo (Veneto), jointly managed by Terminale GNL Adriatico s.r.l. and Infrastrutture Trasporto Gas S.p.A., with a maximum daily capacity of 26.4 million cubic metres;
- Livorno (Tuscany), managed by OLT Off Shore LNG Toscana S.p.A., with a maximum daily capacity of 15 million cubic metres.

[62] Development of the gas infrastructure in AIR is indicated in the ENTSOG development plans: http://www.entsog.eu/publications/tyndp#ENTSOG-TEN-YEAR-NETWORK-DEVELOPMENT-PLAN-2015 (all AIR countries are also members of ENTSOG - European Network of Transmission System Operators for Gas).

[63] There are seven major companies, exploiting both onshore and offshore fields, the main one being ENI S.p.A., with more than 90 % of national production. In addition there are 22 minor companies with only onshore operations.

[64] scm = standard cubic metre

The primary line of the Italian gas **transport network** has a length of approximately 34 000 km, and has been divided[65] into two parts: the **National Gas Pipeline Network**, for a total of 9 268 km, and the regional transportation network for the remaining 24 500 km.[66]

Similarly to the electricity market, the **wholesale market** has been managed since 2009 by GME through an electronic platform. In late 2013 GME also took on the management of futures market on natural gas. Sales to end users tend to be carried out by the distribution companies themselves. While pricing is free, the key underlying economic conditions are defined by the national authority regulating electricity and gas (AEEG).

In 2014 **demand** amounted to 61.9 billion scm (41.69 % residential and tertiary; 28.62 % thermoelectric; 23.41 % industrial): -11.6% compared to 2013, mainly owing to the economic crisis.

Of the hundred or so European PICs related to transmission, liquefaction and storage of gas, 10 are in Italy (out of a total of 31 national PICs), divided between the East Gas Corridor (5), West Gas Corridor (3) and South Gas Corridor or SGC (2), for a total of about 3 900 km with connections to Switzerland, Malta, Algeria and Corsica, Hungary, **Slovenia**, Austria and Germany, **including an LNG terminal in the Adriatic area** and the transport infrastructure interconnecting Europe to the Caspian Sea through Georgia and Turkey. Given the importance of pipelines in the Mediterranean, both from Caspian reservoirs and from North Africa, **Italy is a vital player for the arrival and transit of gas from areas considered to be points of diversification for European supplies**.

At the time of writing of this study, three new pipelines were being planned:

- IGI Poseidon, to connect Puglia with Greece, with a maximum daily capacity of 26.4 million cubic metres;
- TAP (Trans-Adriatic Pipeline), to connect Puglia with Greece through Albania, with a maximum daily capacity of 24.68 million cubic metres;
- GALSI, to connect Algeria with Tuscany passing through Sardinia, with a maximum daily capacity of 26.4 million cubic metres,

as well as three new re-gasification terminals:

- Porto Empedocle (Sicily), with a maximum daily capacity of 26.4 million cubic metres;
- Gioia Tauro (Calabria), with a maximum daily capacity of 39.6 million metres;
- Falconara Marittima (Marche), with a maximum daily capacity of 19.8 million metres.

Moreover, some new projects are under evaluation at the time of writing:

- a re-gasification terminal in Zaule (Friuli-Venezia Giulia), with a maximum daily capacity of 26.4 million cubic metres;

[65] Decree 120/01 of AEEG (30 May 2001): Definizione di criteri per la determinazione delle tariffe per il trasporto e dispacciamento del gas naturale e per l'utilizzo dei terminali di Gnl.

[66] By far the greater part (32 306 km) of the National Gas Pipelines Network is owned and managed by SNAM Rete Gas (www.snamretegas.it), owned by SNAM (www.snam.it), a listed company also operating regasification through GNL Italia (www.gnlitalia.it), in storage through Stogit (www.stogit.it) and in urban distribution through Italgas (www.italgas.it). Other operators, such as SGI (Società Gasdotti Italia, with a total of 1 300 km, the second largest natural gas transport operator in terms of high-pressure network extension, owned by EISER Global Infrastructure Fund; www.gasdottitalia.it) are present with local networks, particularly in the Adriatic regions (Marche, Abruzzo and Molise).

- a re-gasification LNG terminal in Brindisi (Puglia), with a maximum daily capacity of 26.4 million cubic metres, for which the construction and operation permit has been suspended;
- the strengthening of the Panigaglia terminal up to a maximum daily capacity of 26.4 million cubic metres.

The transcontinental interconnectors SGC (10 billion scm/year) and GALSI (7.6 billion scm/year) are of great importance in terms of volume of gas and expansion/diversification of the European network.

The **central role of Italy to the European gas infrastructure will largely depend on its ability to attract investment** and, therefore, increase the chances of the PICs directly involving the country receiving EU funding. Every two years, the published list of PICs may undergo changes according to the progress made in the implementation of the projects, and those that exhibit delays or inability to attract capital (and therefore lack credibility) may be excluded and replaced by others. As EU funds are insufficient compared to the ambitious plan to create a single energy market and compared to the number of projects endorsed, a strategic issue is the need to devise specific acceleration paths involving consultation with local communities and administrative simplification for the implementation of PICs.

The Italian government is also committed **to developing the use of LNG in maritime transport and also in land transport** (in the specific case of heavy transport such as lorries, buses or trains), through the implementation of storage and redistribution centres throughout the national territory, also in order to reduce the environmental impact of diesel engines in transport by sea or land. The Ministry of Economic Development is coordinating an in-depth study of all regulatory, technical and economic issues, involving all relevant institutional and economic stakeholders, including in the area of safety and social impact, with a view to drawing up a National Strategic Plan for the use of LNG.

The Balkan peninsula countries (those which have gas infrastructure) are **heavily dependent on gas supply from the Russian Federation, even though natural gas covers a relatively small percentage of energy demand in their economies.** Bosnia and Herzegovina, Croatia, Serbia and Slovenia operate small gas systems with limited functionalities. Gas demand accounts for a mere 12 % of total Italian demand. **There is no actual connection** between the Croatia–Slovenia system on the one hand and the Bosnia –Serbia system on the other, even though both are supplied via Hungary. The small Greek gas demand is supplied from Bulgaria and via a small-size LNG terminal (Revituossa, near Athens). Greek gas demand stands at about 4 % of the demand figure for Italy. **Gas production areas (Croatia offshore, northern Croatia and northern Serbia) are not connected in any functional way.** For many years no thought was given to the possibility of a gas connection between the Balkan peninsula and Italy, which prevented access to Italian infrastructure from the Balkans. The result of all this is that each country is dependent on gas supplies from Russia on its own account. Significant efforts are being made by international donors and by the EU to eradicate this dependency by offering funding and investments to alternative supply routes. It is still to be assessed if the use of gas in petrochemical and fertiliser industries (as feedstock) may sustain competitive pressures. At the same time, the use of gas for (district and residential) heating is under strong competitive pressure from alternative and more efficient forms of heating. A very low percentage for gas demand in the Balkan peninsula is therefore sustainable in the medium term, and hardly justifies massive infrastructure investments. In this context, **energy efficiency and the switch to renewable energy appear as the most feasible options for securing immediate security of supply.** From another perspective, modern gas technologies provide interesting transport and end-use opportunities (in transport, industry and elsewhere) at much lower fixed costs. **Modern gas technologies are more in line with tourism development, decentralised forms of energy use and resilient transport, as well as decarbonisation goals.** Consequently, new and diversified sources and routes of gas supply may be required to facilitate new forms of economic growth. Such a new infrastructure, serving new and economically competitive demand, may include

supply to Montenegro, Albania and the southern parts of Bosnia and Herzegovina - territories that currently do not have any gas infrastructure.

Box: January 2009 gas supply crisis in Balkans

In January 2009 natural gas supply from the Russian Federation via Ukraine to the rest of Europe was interrupted. South-eastern Europe was the area most affected by this interruption. Industrial consumption was suspended, district heating systems were shifted to alternative fuels, and school holidays were prolonged. Only Croatia was able to arrange gas supply, from offshore fields that supply gas to Italy, and to tap its own resources. Other countries were dependent on assistance from the rest of Europe. It is interesting to note the extraordinarily high levels of energy consumption during that period. While winter demand for gas is by its nature much higher than summer demand, in some cases here peak demand was 37 times higher than the minimum. This points to a failure of energy efficiency policies and overall energy policy in the region. However, response to this security of supply risk has to date remained focused on alternative supplies rather than on energy efficiency.

See: http://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/NG29-TheImpactoftheRussiaUkrainianCrisisinSouthEasternEurope-AleksandarKovacevic-2009.pdf

3.3. Petroleum

AIR is one of the largest oil and oil products transport areas in Europe, Mediterranean and the world. Recent figures suggest a presence of almost 55 million tonnes (mt) of crude oil refining capacity in the Region (Adriatic Italy <15mt, former Yugoslavia >20mt, Greece and Albania >19mt), while two major oil pipeline systems, TransAlpine Pipeline (TAL) and Adria Pipeline (JANAF), are capable of supplying 40 mt and 30 mt of crude respectively to inland refineries.

As a consequence, the Adriatic Sea receives a very large crude transport load, mostly in medium-sized crude carriers. The most active port that of Trieste (TAL), has a limited capability to receive Very Large Crude Carriers (VLCCs), while the much deeper port at Omisalj (Rijeka) is capable of receiving VLCCs but has limited demand from refineries supplied by the Adria Pipeline. **Consequently, crude transport routes are congested, and this generates massive environmental impacts and high levels of risk.**

The Balkan region is the region of Europe most vulnerable to external competition on the petroleum product market. Its countries are dependent on a number of relatively small petroleum refineries which can scarcely compete in the global marketplace. Improvements in transport routes (coastal shipping, inland waterborne transport and railways) and falling demand due to technological change and competition are likely to put pressure on local refineries. A number of refineries have already been closed or are experiencing difficulties (Sisak, Novi Sad, Brod, Skopje), while those at Rijeka and Pancevo are increasingly exposed to competition. Availability of domestic crude and government support may delay critical competitive pressures for a period of time, while more competitive fuel markets are emerging in various forms and there is an increase in the use of gas for transport. This evolution requires governments to rethink their fiscal policies, open markets up to competitive suppliers, and introduce various energy efficiency initiatives.

Part of oil refinery capacity is already closed or converted while all other capacity is at risk of closure, owing to falling demand and competition from non-European refineries that are closer to crude sources (in the Middle East, the US, North Africa, the Russian Federation and the Black Sea and Central Asia region) or operate significant economies of scale and complexity. Changes in the structure of demand for petroleum products (phasing-out of heavy fuels, dieselisation) and competition from other transport modes and fuels (LNG, CNG, electricity) are challenging refinery positions on local markets and are likely to increase pressure for further closures. In Italy, which is a more open and

commercial market, almost 11 mt of refining capacity has already been phased out. The remaining refineries in Croatia are under control of MOL of Hungary, while those in Bosnia and Herzegovina and Serbia have been acquired by Russian interests.

The Rhine-Main-Danube system is emerging as a competitive supply route for petroleum products from the Black Sea area and Western Europe. LNG transport infrastructure in the AIR itself creates further competitive pressures on petroleum products and refineries.

It is to be considered that the phasing-out of oil refining and crude oil transport from the Adriatic is on the way, and that this trend is likely to speed up in the near future.

Box: Green NGO activities in the AIR

Green NGOs in the Adriatic area are active and successful in their activities. In 2004/2005, such an NGO from Kvarner (Croatia) with support from others in Croatia and Italy, protested against and stopped the Druzba–Adria project, which would have converted the Adria Pipeline into an export pipeline for Russian crude. Over the years, green NGOs have protested successfully against LNG terminals, new power plants intended to burn imported coal, large hydro power projects intended to disrupt natural water flows in the Dynaric Alps, oil and gas exploration in the Adriatic, and inadequate waste management. Recently, civil society organisations have called for referendums on coal-fired plants in Ploce and Plomin in Croatia to give the public the chance to reject the projects.

NGOs are involved in raising awareness on climate change impacts and pollution of the sea, as well as creating an enabling social environment for community projects such as waste management on islands, cycling on Krk island, secure water supply, support for agriculture in the Neretva valley, the 'slow food' movement, etc. Funding for such local groups remains limited, despite their contribution to promoting the public interest.

Governments in the Balkan Peninsula are adopting new laws and by-laws to promote 'strategic projects', even where public opinion opposes them. This creates more opportunities for green NGOs to engage in public discussion and promote the Aarhus Convention principles.

3.4. Solid fuels

There are emerging trends in the trade in and use of solid fuels in the AIR. Following conflicts in former Yugoslavia, **over half the population in Bosnia and Herzegovina, Montenegro and Serbia use fuel wood and lignite as a main source of heat for space heating and cooking.** Use of these solid fuels is very **inefficient and polluting.** Indoor pollution affects women, children and the old, who spend most of time indoor during winter months. Roma communities are among the most affected.

Most densely populated areas in the Dynaric mountains are located at the bottom of karst valleys with little wind and often adverse air pollution. Scattered lignite resources also tend to be available in those valleys, which appear as sites for industry and large lignite combustion plants. Pollution from these major sources is accompanied by pollution from residential-scale sources to form **some of the most difficult air-shed pollution problems in Europe.** Local soil acidification facilitates loss of forest cover, land sliding and floods, all of which contribute to human insecurity.

Fuel wood prices are governed by electricity and gas prices (the latter being alternative fuels), very low efficiency of use, scarcity (during cold winter periods), motor fuel prices and taxes, as well as alternative demand. As a consequence, **the population is exposed to massive fuel poverty risks** from pollution (disease and related costs as well as inadequate healthcare), high fuel costs and low efficiency, the latter meaning that

significant volumes are consumed to limited effect. More detailed surveys[67] reveal a significant reduction in living space and supplementary use of electricity during cold periods.

The most recent trend is the development of **wood pellet** production in the Balkans intended for export to Slovenia, Italy and Austria. Pellet exports from Bosnia and Herzegovina and Serbia already amount to hundreds of thousands of tonnes. Strong demand for pellet is built on financial support for renewable energy (biomass) in importer countries and falling costs of transport fuels. Entrepreneurs are approaching wood markets with superior liquidity and ability to purchase raw wood year round. They are able to offer competitive prices and terms of payment to harvesters and out-compete local dwellers.

This trend puts an **upward pressure on local fuel wood prices and adds to fuel poverty in the region, as well as increasing inequality and environmental and health risks.** Governments are reluctant to address (by comprehensive energy efficiency and fuel poverty eradication programmes) the fuel poverty problem and its link to fuel wood, since a decrease in fuel wood consumption may effectively depress renewable energy statistics and make it more difficult for countries to achieve the renewable energy targets agreed within the context of the Energy Community Treaty. Donor support for effective fuel poverty eradication is almost non–existent.

Vertically integrated energy utilities in the region regard retail sales of lignite to residential markets as liquid sales. In the context of their problems with collection and tax burdens, cash revenues become increasingly important. Peak demand caused by supplemental use of electricity for heating during cold periods causes the bulk of network losses and justifies investment in network infrastructure and thus the preservation of lignite-fired power generation capacity on grounds of social vulnerability. This is a critical justification for electricity price control by governments, which own electrical utilities across the Balkans.

Box: Sarajevo Air Pollution Control Project

In 1976 the World Bank launched the Sarajevo Air Pollution Control Project in order to eradicate life-threatening air pollution in the city of Sarajevo (Bosnia and Herzegovina), with a view to the 1984 Winter Olympics. The project comprised the construction of 265 km of natural gas pipeline from Belgrade to Sarajevo and gas distribution in the city, and was successfully completed in 1982.
See: http://documents.worldbank.org/curated/en/1976/05/734673/yugoslavia-sarajevo-air-pollution-control-project

During recent winter periods Sarajevo has once again been exposed to unsustainable levels of air pollution. The very high cost of natural gas imported from the Russian Federation and high transit fees through Hungary, Serbia and Bosnia and Herzegovina have made (also expensive) fuel wood and lignite a viable heating option. Residential customers, many of them unemployed, choose to abandon natural gas and shift to solid fuels that seem more affordable in the short run (until health costs are taken into account).

Similar situations occur in Uzice, the suburbs of Belgrade, Nis, Kraljevo and other cities in Serbia, as well as in Pljevlja in Montenegro and other Bosnian cities (Tuzla and Zenica).

Further reading:
http://www.dw.de/a-bad-grade-for-air-quality-in-the-balkans/a-16589036
http://www.neurope.eu/article/alert-dangerous-air-pollution-sarajevo/
http://www.aljazeera.com/video/europe/2013/01/20131518351350502.html
http://www.independent.mk/articles/7187/Skopje+is+Second+Most+Polluted+City+in+Europe
http://www.sarajevotimes.com/pollution-again-air-quality-index-unhealthy/

[67] See for example: http://www.rs.undp.org/content/dam/serbia/Publications%20and%20reports/English/UNDP_SRB_Stuck_in_the_Past_Energy,_environment_and_poverty_in_Serbia_and_Montenegro.pdf or https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/664179/WBEES.pdf

4. Conclusions

At the **5th World Power Conference** held in Vienna in 1956, a key energy policy strategist from the then Yugoslavia, Stjepan Han, gave a lecture on 'Some Economic Aspects of International Collaboration in the Production and Use of Power with Special Reference to the Southern part of Central Europe'. The geographical area covered by his paper was very similar to that of the AIR of today. He stated: 'The strongest economic justification for collaboration between the countries in the Region lies in the fact that the development and operating programmes of their power industries do not tally in time and will never lead to identical load characteristics'; and concluded: 'A non-integrated power industry would be a luxury, which this part of Europe could hardly afford'.

Even though modern renewable energy technologies have made redundant his warning that the AIR is disproportionally poor in conventional energy, **renewable energy potential makes regional and European integration even more of a necessity**. More **solar** and **wind** energy in Italy and Greece, as well as along the Adriatic-Ionian coasts, naturally require more integration with **hydropower** and **accumulation lakes**, in the Dynaric Alps as well as along the Danube, and this in turn requires massive forestation (a facility for interesting **biomass–to–power opportunities). Better use of existing infrastructure prior to further investment in new infrastructure** is a critical prerequisite that did not apply in 1956 as it does today. Both the Balkans and Italy are underutilising available infrastructure capacity and both can benefit from integration.

It is to be emphasized that Greece is exposed to risks and challenges beyond macrofinancial aspects, including exposure to climate change risks, security of supply risks, fuel poverty and water stress. It is not likely that Greece can address these problems without stronger integration with the rest of the AIR. In that context, AIR countries would need to realign their energy and transport policies as well as to open their markets up to massive private investment.

4.1. Development matrixes

Three development matrixes summarise the complexities of energy/transport/tourism interrelations and place them in the context of global, regional and local development frameworks, as well as in that of the EUSAIR pillars. Interrelations between energy, transport and tourism are critical for understanding development bottlenecks and opportunities. Development policy that addresses these interfaces may facilitate economic growth in the AIR.

Table 18: Energy-Transport-Tourism interrelations

	Energy	Transport	Tourism
Energy	Change in both energy supply and demand is inevitable Market share of some forms of energy (liquid fuels, lignite) is likely to decrease More efficient conversion and use of energy critical to be facilitated Massive increase in volume and scope of renewable energy will require far better integration between Italian and Balkan electricity infrastructures	Energy provides more efficient and resilient transport fuels and additional demand for transport services, including transport of biomass	Zero-net-energy tourist accommodation provides development opportunities for a longer tourist season and better use of available energy infrastructure Lower energy costs allow competitive pricing of tourist services
Transport	Development of intermodal transport reduces the cost of transport and paves the way for external competitors on energy markets as well as more decentralised forms of energy and more competitive renewable energy (decrease of transport costs for biomass for example)	More efficient transport allows more effective competition on the transport fuel market, lower fuel costs and new economies of scale and economies of standardisation in transport	Cleaner and more efficient fuels decrease travel costs for tourists allowing more complex itineraries exploring more of the cultural and natural heritage, which is better preserved with cleaner energy.

	Energy	Transport	Tourism
Tourism	Efficient tourism generates more sustainable energy demand that facilitates investment in new energy resources and renewable energy Growing demand for energy improves efficiency of use and creates a better energy–to–GDP ratio	Resource-efficient tourism over a longer tourist season provides more robust demand for transport services and facilitates investment in transport infrastructure	Intra-regional tourist movements shift energy and transport demand providing interesting opportunities for optimisation of occupancy and utilisation rates Resource-efficient tourism accommodation creates solutions for efficient housing, decreasing costs of living and providing more demand for tourism services

AIR is part of the global transport, energy and tourism market. In global terms, the region remains relatively modest in size but represents an interesting component that delivers diversity and calls for innovation. Diversity is regional and local. These diversities facilitate the position of this region in the global landscape. However, inherited and traditional diversities require nursing, care and development in the form of sensible regional and local governance, in order to preserve and enhance its positioning on the global marketplace. It is a matter of very fine tuning of governance frameworks that needs to manage interfaces between global, regional and local levels.

Table 19: Global-Regional-Local interrelations

	Global	Regional	Local
Global	Integration into global transport, energy and tourism markets provides opportunity for portfolio optimisation in many different aspects	Global integration provides regions with various opportunities	Global markets provide knowledge and customers for local requirements
Regional	Regional dimension provides more information, more experience of global trends and more opportunities for adjustment.	Regional framework requires regional governance that is open for global challenges and trends as well as for local potentials There is a need for new forms of public participation in regional decision- making	Regional integration provides framework for local differences to grow and integrate
Local	Diversity of the region, if preserved and developed, feeds into its global competitiveness	The Region is more and more (re)created from the bottom up. It requires all its differences to build position in the future marketplace	Local engagement preserves natural and cultural heritage and provides small-volume exclusive products interesting for local consumption It facilitates and preserves attractive types of tourism while promoting traditional and sustainable forms of transport (cycling, walking) and energy use It promotes sustainable housing

Taking into account energy-transport-tourism interrelations within global-regional-local frameworks, it is now possible to consider critical development aspects in relation to the EUSAIR pillars (Blue Growth, Connecting the region, Environmental quality and Sustainable tourism), as follows:

Table 20: Energy-Transport-Tourism in the EUSAIR pillars context

	Energy	Transport	Tourism
Blue growth	Cleaner and more efficient fuels facilitate Blue Growth while use of renewable and efficient energy inland decreases environmental load on coastal waters and narrow seas Shift to gaseous fuels for bunkering Better use of hydro power installations and forestation as well as more responsible and better integrated water management across territory appear important for preservation of sea resources	Provides sustainable transport demand More efficient transport provides an opportunity to trade fishery / aquaculture products inland	Facilitates resilient tourism development based on local resources and creates demand for outcomes of the Blue Growth process Local food, including fish, increases attractiveness of tourism services
Connecting the region	Better transport and energy connections are critical for energy market integration and physical openness of energy markets Future power generation mixes have to be built on complementarities and synergies between various forms of renewable energy. Connection infrastructure is not sufficient for better connectivity: there is a need for complementary energy generation portfolios.	Provides sustainable transport demand and market integration There is a need to balance risks and opportunities from better international transport with particular emphasis on larger transport capacity of the Suez Canal	The wider the connectivity the more interesting it becomes for the global tourist market
Environmental quality	Use of renewable energy – especially growing of sustainable biomass – marks a critical improvement in environmental quality and a key contribution to clean energy that also improves land use and water quality Development of wind and solar potential would require new energy policies and regional complementarities. Massive development of cross-border hydro potential across the Balkans is critical for any regional development strategy.	Requires sustainable transport: lower transport costs allow, inter alia, more effective use of biomass and better economies of scale.	Environmental quality is a prerequisite for the tourism of the future
Sustainable tourism	Sustainable tourism ensures sustainable demand for energy services that facilitate investments into infrastructure Efficient supply and use of energy as well as eradication of fuel poverty and difficult weather sensitivity of energy demand are prerequisites for a whole-year tourist season	Provides sustainable transport demand Better connectivity in the region provide more options for tourists and more opportunities for tourist businesses A whole-year tourist season may be a more realistic objective if accompanied by more efficient transport Tourism development requires stronger regional integration and more transport services to deliver necessities (food, energy) and people	Tourism growth generates more tourism growth: there is significant economy of scale in tourism. Tourists are attracted to destinations that are already known and visited by many. At the same time, more tourist visits and a longer tourist season as well as variety of tourist services decrease unit costs of tourist services through decrease of infrastructure costs per time period or per person. This also allows investment in infrastructure, better maintenance and higher quality service.

4.2. Key Factors of Success

The key factors of success could be considered to be the following:

- Enhanced regional cooperation at various levels (parliaments, governments, institutions, academia, civil sector, professional associations, chambers, individuals) is required to provide a basis for policy innovation. Resilient forms of public participation in decision-making are critical in order to facilitate policy innovation.

- Physical openness is required if societies aim to exercise newly acquired economic freedoms and development opportunities. The least-cost option to enhance physical openness is to enhance the use of existing infrastructure. This is to be considered before investing in new infrastructure.

- Preservation of diversity in general and biodiversity in particular is key to enhancing the attractiveness of this region for tourism and for investment, as well as to justifying investment in infrastructure integration and connections and increasing the economic value of Blue Growth.

- Achievement of a whole-year tourist season is critical for utilisation of infrastructure and assets and better value for money in services. Better energy efficiency, in the energy sector, energy use and transport, is a critical enabling factor for a whole-year tourist season.

- There are only a few critical focus points in the AIR that are key determinants of development prospects (intermodal centres, critical transport links, etc.). These points require special strategic attention from decision-makers across the whole of the AIR and the EU. At these points, even small-scale interventions under the jurisdiction of local authorities may impact development opportunities for the whole region.

- Integration of energy markets between Italy, the Western Balkans and Greece in order to exploit complementarities of both supply and demand.

- Use of available hydro resources and resolution of cross-border disputes (to facilitate development of further resources) are critical for regional integration within the AIR and with the rest of Europe, as well as for better control of risk accumulation in Greece and other countries.

5. Recommendations

Thanks to its **exceptional diversity**, the Adriatic-Ionian Initiative within the EUSAIR has become a platform for introducing **policy innovation** into energy, transport and tourism development strategies at regional and national level. AIR is empowered by the combination of the underdeveloped energy and transport markets in the Balkans and the highly developed Italian market.

Development in the Region requires direct communication between very local actors who are directly responsible and interested in critical decisions. They have to communicate and understand the consequences of their actions as well as the dependence of their opportunities on actions of others. The AIR needs new 'champions' of growth and development. There is a need for mechanisms to take on board these 'champions' despite vested interests and political disputes of the past. Regional associations of professional organisations and specialised businesses may have their own development vision, and need assistance and resources to articulate their visions, but also mechanisms to promote the opportunities concerned to international donors, institutional investors and decision-makers at critical development choke-points.

It would be of interest to facilitate the creation of an Association of Southern Balkan Ports (Bar, Shkoder/Dures, Piraeus, Patras, Thessaloniki) equivalent to the existing North Adriatic Port Association (NAPA). Such an organisation may be able to create more competitive pressure and further promote container and intermodal transport. Similarly, there is a need for an inland (Sava – Danube) port association, which would act as an inland counterpart to the two coastal port groups.

Enhancement of Danube navigation is important for regional integration and connectivity, and requires an update of the Danube Convention and its alignment with the EU water acquis.

The Dynaric Alps require an integral water management system as a basis to preserve their precious biodiversity, enhance safety and resilience to climate change on both sides of the mountains, and boost the contribution of available hydro energy resources to the deployment of renewable energy in the AIR. There is a need for new forms of cooperation between national governments of countries connected by a body of water that is scattered across territory but is nevertheless as independent as a single river or sea. This form of cooperation is of interest for the entire Adriatic Ionian Region and in the context of Blue Growth, connectivity, tourism and environmental quality, as well as energy interrelations.

The new energy policy of Greece, which is inevitably a part of the country's reform programme, needs to focus on renewable energy (solar and wind) as well as energy efficiency. Such reorientation needs to be massive but will be almost impossible without adequate integration with hydro power resources in the rest of the Balkans. From another point of view, such integration requires improvement in the use of existing cross-border hydro resources in the Balkan peninsula and a framework to develop new resources. Physical connections are critical but not sufficient to facilitate integration.

Policy innovation is crucial. There are requirements for new forms of cooperation and new institutions. There is also a need for a multidisciplinary and strategic view on the AIR. Therefore, it may be interesting to establish an independent multidisciplinary thinktank which would create new ideas and promote new initiatives. Such a thinktank could address complex open questions at development choke-points.

The material requirements that are built into the Stabilisation and Association Agreements[68], the Energy Community Treaty and the Energy Charter[69] require adequate enforcement and eventually better alignment. These requirements have to be reconsidered in the context of forthcoming global climate change arrangements and the latest understanding of risks.

There is also need for better alignment between the AIR, the Berlin Process for the Western Balkans[70], the EU accession process, the EU Connectivity Agenda[71], IMF interventions and the investment policies of international development institutions. AIR countries may consider a comprehensive regional development conference in 2016 to implement eventual global climate change agreement and address complex risks that are relevant for the region.

[68] Stabilisation and Association Agreements constitute the framework of relations between the EU and the Western Balkan countries for implementation of the Stabilisation and Association Process. The agreements are adapted to the specific situation of each country and establish a free trade area between the EU and the country concerned, **Source:** http://ec.europa.eu/enlargement/policy/glossary/terms/saa_en.htm

[69] See: http://www.energycharter.org/

[70] This is a five-year process marked by yearly summits in order to underline the commitment to EU enlargement to include the Western Balkans region.

[71] See for example: http://ec.europa.eu/enlargement/pdf/policy-highlights/regional-cooperation/20150828_vienna_info_pack.pdf

REFERENCES

- Analysis to support the elaboration of the Adriatic and Ionian maritime Action Plan, Studies to support the development of sea basin cooperation in the Mediterranean, Adriatic/Ionian and the Black Sea, Report 2, January 2014
- Athanasios Ziliaskopoulos: The Critical Lind in the Global Supply Chains form the Far East to Southeastern and Central Europe, Trainose S.A
- Cataldi Alessandra, Slo Stefano and Pietro Zoppoli: The Merit-Order Effect in the Italian Power Market: The Impact of Solar and Wind Generation on National Wholesale Electricity Prices, Working Papers, No 9, Ministry of Economy and Finance, Department of the Treasury of Italy, December 2014
- Centre for European Economic Research Gmbh (ZEW), Mannheim, Institute for Applied Economic Research (IAW), Tübingen, the Vienna Institute for International Economic Studies (WIIW): Socio-Economic Assessment of the Danube Region: State of the Region, Challenges and Strategy Development, Final Report Part I, ZEW, March 2014
- Commission staff working document, Action Plan Accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, concerning the European Union Strategy for the Adriatic and Ionian Seas, European Commission, Brussels, 17 June 2014.
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Maritime Strategy for the Adriatic and Ionian Seas, European Commission, Brussels, 30 November 2012
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Maritime Strategy for the Adriatic and Ionian Seas, European Commission, Brussels, 17 June 2014
- Cruise Activities in Medcruise Ports: Statistics 2014, A MedCrise Report, The Association of Mediterranean Cruise Ports, Piraeus 2015
- Frans-Paul van der Putten: Chinese Investment in the Port of Piraeus, Greece: The Relevance for the EU and the Netherlands, Clingendael Report, Clingendael, Netherlands, Institute of International Relations, 2015
- Ida Simonella: Adriatic and Ionian Ports: Ports, traffic and the UE political strategy for Adriatic and Ionian Region, Sea Traffic Observatory – 2013 Report, Forum of Adriatic and Ionian Chambers of Commerce, ISTAO, Corfu, 11 June 2014
- International Trade Report in the Adriatic and Ionian Area, Statistics Data, update 2013, Ancona, May 2014
- Jakov Karmelic: North Adriatic vs. North Europe – myths, facts and truth, Regional Conference: Development of Sustainable Intermodal Transport, Rijeka, 4 March 2014
- MDS Transmodal Limited: NAPA: Market study on the potential cargo capacity of the North Adriatic ports system in the container sector, Draft Report, December 2011
- Murgasova Zuzana, Nadeem Ilahi, Jacques Miniane, Alasdair Scott, Ivanna Vladkova-Hollar and IMF Staff Team: The Western Balkans 15 Years of Economic Transition, Regional Economic Issues Special Report, International Monetary Fund, March 2015

- PAI COWI for European Commission: Study on Parliamentary Cooperation, Mapping and Analysis of International Parliamentary Institutions and Parliamentary Networks in the Western Balkans and South East Europe, European Commission, February 2015
- Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, concerning the governance of macro-regional strategies, Brussels, 20 June 2014
- Yale Center for Environmental Law and Policy, Yale University, and World Economic Forum, Geneva, Switzerland: 2014, Environmental Performance Index, Full Report and Analysis, www.epi.yale.edu, 2014
- CENSIS (2011), *Rapporto economia del mare 2011*
- Federazione del Mare (2012), *IV Rapporto sull'Economia del Mare*
- S. Cautadella, M. Spagnolo (2012*), Lo stato della pesca e dell'acquacoltura nei mari italiani*
- World Tourism Organization (2014), *UNWTO Tourism Highlights*
- Banca d'Italia, Eurosistema (2011), *Le infrastrutture in Italia: dotazione, programmazione, realizzazione*
- Unicredit (May 2013), *Rapporto Infrastrutture e Trasporti*
- One Works, KPMG, Nomisma (2010), *Studio sullo sviluppo futuro della rete aeroportuale nazionale quale componente strategica dell'organizzazione infrastrutturale del territorio*
- Ministero delle Infrastrutture e dei Trasporti, ENAC (2012), *Piano Nazionale degli Aeroporti 2012*
- Terna Rete Italia (2015), *Previsioni della domanda elettrica in Italia e fabbisogno di potenza necessario 2014-2024*
- SNAM Rete Gas (2015), *Piano decennale di sviluppo delle reti di trasporto di gas naturale 2015-2024*
- Società Gasdotti Italia S.p.A. (2014), *Piano decennale di sviluppo delle reti di trasporto di gas naturale 2014-2023*
- The Boston Consulting Group (2014), *Creating People Advantage 2014-2015*
- European Commission (2011), Proposal for a Regulation of the European Parliament and of the Council establishing the Connecting Europe Facility - COM(2011)0665
- European Technology Platform, *Waterborne* (2012), *Strategic Research Agenda Overview*
- AEEG (2001), *Decreto 120/01 - Definizione di criteri per la determinazione delle tariffe per il trasporto e dispacciamento del gas naturale e per l'utilizzo dei terminali di Gnl*

INTERNET RESOURCES[72]

http://www.a2a.eu
http://www.acea.it
http://www.adriatic-ionian.eu/
http://www.adriaticionianeuroregion.eu/
http://www.adrion.forumaic.org/index.php
http://www.aii-ps.org/
http://www.aiscat.it
http://www.assoaeroporti.it
http://www.assoporti.it
http://www.autorita.energia.it
http://www.autostrade.it
http://www.cefta.int/
http://www.cei.int/
http://www.centostazioni.it
http://www.danube-region.eu/
http://www.enel.it
https://www.energy-community.org/portal/page/portal/ENC_HOME
https://www.entsoe.eu/Pages/default.aspx
http://www.entsog.eu/
http://www.forumaic.org/index.php?strLang=en
http://www.fsitaliane.it
http://www.gasdottitalia.it
http://www.gnlitalia.it
http://www.grandistazioni.it
http://www.gse.it
http://www.istat.it
http://www.italferr.it
http://www.italgas.it
http://www.its-napa.eu/
http://www.mercatoelettrico.eu
http://www.mit.gov.it
http://www.ntvspa.it
http://www.portsofnapa.com/
http://www.ramspa.it
http://www.rcc.int/
http://www.rfi.it
http://www.seetoint.org/
http://www.snam.it
http://www.snamretegas.it
http://www.southeast-europe.net/en/
http://www.stogit.it
http://www.stradeanas.it
http://sunbeam.univpm.it/EN/home
http://www.terna.it
http://www.trenitalia.it
http://www.uniadrion.net/

[72] Accessed 8 July 2015

ANNEX 1: ECONOMIC DATA, TABLES AND MAPS[73]

Table 21: Population[74]

COUNTRY	2005	2010	2011	2012	2013
Albania	3 011	2 913	2 905	2 900	2 897
Bosnia and Herzegovina	3 843	3 843	3 840	3 836	3 832
Croatia	4 312	4 296	4 283	4 269	4 254
Greece	11 093	11 153	11 123	11 093	11 063
Italy	58 191	59 830	60 060	60 339	50 646
Montenegro	623	619	621	620	621
Serbia	7 441	7 291	7 234	7 199	7 164
Slovenia	2 000	2 049	2 053	2 057	2 060

Source: WIIW based on EuroStat and national statistics

Table 22: **Territory, population and GDP density**

COUNTRY	Territory (km^2)	Population density (persons per km^2)	GDP density (1000 EUR/km^2)
Albania	28 748	99	341
Bosnia and Herzegovina	51 129	75	262
Croatia	56 542	78	771
Greece	131 957	81	1 382
Italy	301 230	198	5 374
Montenegro	13 812	45	238
Serbia*	77 474	92	443
Slovenia	20 273	101	1 781

Source: WIIW, Eurostat and latest census by country

[73] All data and maps from the WIIW data base, EuroStat and national statistics compiled and made comparable by WIIW. All highlights by Authors.
[74] Expressed in thousands of people.
* Serbia territory and population excluding Kosovo.

Table 23: Gross Domestic Product per capita at PPP relative to EU-28

COUNTRY	2005	2010	2011	2012	2013
Albania	22.1	27.6	28.0	27.9	28.1
Bosnia and Herzegovina	22.1	26.1	26.5	26.4	27.0
Croatia	57.0	58.0	58.3	58.4	58.5
Greece	89.4	85.6	76.9	72.9	71.5
Italy	105.1	101.9	101.1	100.0	97.8
Montenegro	29.4	39.7	40.2	38.7	36.7
Serbia	31.5	35.0	36.0	36.1	36.7
Slovenia	85.1	81.7	81.8	81.0	80.7

Source: WIIW based on EuroStat and national statistics

Table 24: Final consumption expenditures of households (shares in % of GDP)

COUNTRY	2005	2010	2011	2012	2013
Albania	77.9	77.6	77.8	77.5	77.1
Bosnia and Herzegovina	96.3	85.6	85.1	86.8	85.8
Croatia	59.1	58.0	58.7	59.2	59.6
Greece	66.1	68.1	67.7	67.0	68.8
Italy	58.9	60.5	61.0	60.6	59.9
Montenegro	69.9	82.2	82.5	83.6	81.5
Serbia	74.8	77.1	76.2	76.1	74.4
Slovenia	52.8	55.1	55.1	55.1	53.4

Source: WIIW based on EuroStat and national statistics

Table 25: Current account, % of GDP

COUNTRY	2005	2010	2011	2012	2013
Albania	-9.0	-11.3	-13.2	-10.2	-10.6
Bosnia and Herzegovina	n.a.	-6.2	-9.6	-9.2	-5.9
Croatia	-5.2	-1.1	-0.8	-0.1	0.9
Greece	n.a.	-9.9	-9.9	-2.4	-0.6
Italy	-0.9	-3.5	-3.1	-0.5	1.0
Montenegro	-16.6	-22.9	-17.7	-18.7	-14.6
Serbia	-8.4	-6.3	-8.6	-11.5	-6.1
Slovenia	n.a.	-0.1	0.2	2.6	5.6

Source: WIIW based on EuroStat and national statistics

Table 26: **Foreign direct investment inflow**

COUNTRY	2005	2010	2011	2012	2013
Albania	3.2	8.8	6.8	6.9	9.8
Bosnia and Herzegovina	3.2	2.4	2.7	2.1	1.6
Croatia	4.0	0.8	2.4	2.4	1.0
Greece	n.a.	0.2	0.4	0.7	1.2
Italy	2.0	0.4	1.5	0.0	0.9
Montenegro	22.2	18.5	12.4	15.3	10.1
Serbia	6.0	3.4	5.8	0.9	2.3
Slovenia	1.6	0.8	1.9	-0.2	-2.2

Source: WIIW based on EuroStat and national statistics

Table 27: GDP per capita at PPP (EUR at current PPP)

COUNTRY	2005	2010	2011	2012	2013
Albania	5 200	7 100	7 400	7 500	7 600
Bosnia and Herzegovina	5 200	6 700	7 000	7 100	7 300
Croatia	13 400	14 900	15 400	15 700	15 800
Greece	21 000	22 000	20 300	19 600	19 300
Italy	24 700	26 200	26 700	26 900	26 400
Montenegro	6 900	10 200	10 600	10 400	10 700
Serbia	7 400	9 000	9 500	9 700	9 900
Slovenia	20 000	21 000	21 600	21 800	21 800

Source: WIIW based on EuroStat and national statistics

Note: Only Slovenia and Italy have population growth below 1 %, Montenegro population remains stable while other countries have demographic decline

Table 28: **Gross Fixed Capital formation (shares in % of GDP)**

COUNTRY	2005	2010	2011	2012	2013
Albania	37.0	28.4	29.4	25.8	26.3
Bosnia and Herzegovina	27.9	17.3	18.6	18.6	17.9
Croatia	25.4	21.3	20.3	19.6	19.3
Greece	20.7	17.3	15.4	11.7	11.2
Italy	21.1	19.9	19.6	18.6	17.8
Montenegro	18.0	21.1	18.4	18.5	19.2
Serbia	20.1	18.6	18.4	21.2	17.5
Slovenia	26.6	21.2	20.2	19.2	19.7

Source: WIIW based on EuroStat and national statistics

Table 29: Export of goods and services (shares in % of GDP)

COUNTRY	2005	2010	2011	2012	2013
Albania	22.8	32.4	34.0	33.3	33.6
Bosnia and Herzegovina	32.6	29.1	31.1	30.9	32.0
Croatia	39.3	37.7	40.4	41.6	42.9
Greece	21.3	22.1	25.5	28.2	30.2
Italy	24.6	25.2	27.0	28.3	28.6
Montenegro	43.5	34.7	42.8	44.1	41.8
Serbia	27.1	32.9	34.0	36.9	41.2
Slovenia	59.6	64.3	70.4	73.2	74.7

Source: WIIW based on EuroStat and national statistics
Note: shaded cells indicate export surplus

Table 30: **Imports of goods and services (shares in % of GDP)**

COUNTRY	2005	2010	2011	2012	2013
Albania	47.5	53.0	56.7	51.9	51.1
Bosnia and Herzegovina	73.7	51.1	55.3	55.2	53.1
Croatia	45.4	38.2	40.9	41.1	42.5
Greece	29.6	30.7	32.3	32.7	33.2
Italy	24.8	27.1	28.6	27.4	26.3
Montenegro	61.1	63.1	64.9	68.8	62.1
Serbia	47.1	47.9	49.4	53.6	51.9
Slovenia	60.2	62.8	68.4	68.9	68.7

Source: WIIW based on EuroStat and national statistics
Note: shaded cells indicate imports over 2/3 of GDP

Table 31: Unemployment rate - Labour Force survey (% of labour force.)

COUNTRY	2005	2010	2011	2012	2013
Albania	14.1	14.0	14.0	13.4	15.6
Bosnia and Herzegovina	44.1	27.2	27.6	28.0	27.5
Croatia	12.7	11.8	13.5	15.9	17.2
Greece	10.0	12.7	17.9	24.5	27.5
Italy	7.7	8.4	8.4	10.7	12.2
Montenegro	30.3	19.6	19.7	19.7	19.5
Serbia	20.8	19.2	23.0	23.9	22.1
Slovenia	6.5	7.3	8.2	8.9	10.1

Source: WIIW based on EuroStat and national statistics

Table 32: **General Government Gross Debt (shares in % of GDP)**

COUNTRY	2005	2010	2011	2012	2013
Albania	57.4	57.7	59.4	62.0	70.0
Bosnia and Herzegovina	25.7	39.1	40.8	44.6	42.4
Croatia	29.6	52.8	59.9	64.4	75.7
Greece	n.a.	146.0	171.3	156.9	174.9
Italy	101.9	115.3	116.4	122.2	127.9
Montenegro	38.6	40.9	46.0	54.0	56.3
Serbia	50.2	41.8	45.4	56.2	59.6
Slovenia	26.3	37.9	46.2	53.4	70.4

Source: WIIW based on EuroStat and national statistics
Note: shaded cells indicate increase in General Government Gross debt relative to GDP

Table 33: Gross External Debt (shares in % of GDP)

COUNTRY	2005	2010	2011	2012	2013
Albania	25.2	45.6	53.5	57.4	63.3
Bosnia and Herzegovina	25.3	25.3	25.8	27.8	28.2
Croatia	71.2	104.2	103.7	103.0	105.3
Greece	112.0	180.3	178.5	225.7	228.7
Italy	95.4	114.0	111.3	117.6	117.7
Montenegro	28.3	29.4	32.9	41.1	43.1
Serbia	57.8	79.9	72.2	81.2	75.4
Slovenia	70.1	112.4	108.8	114.6	110.5

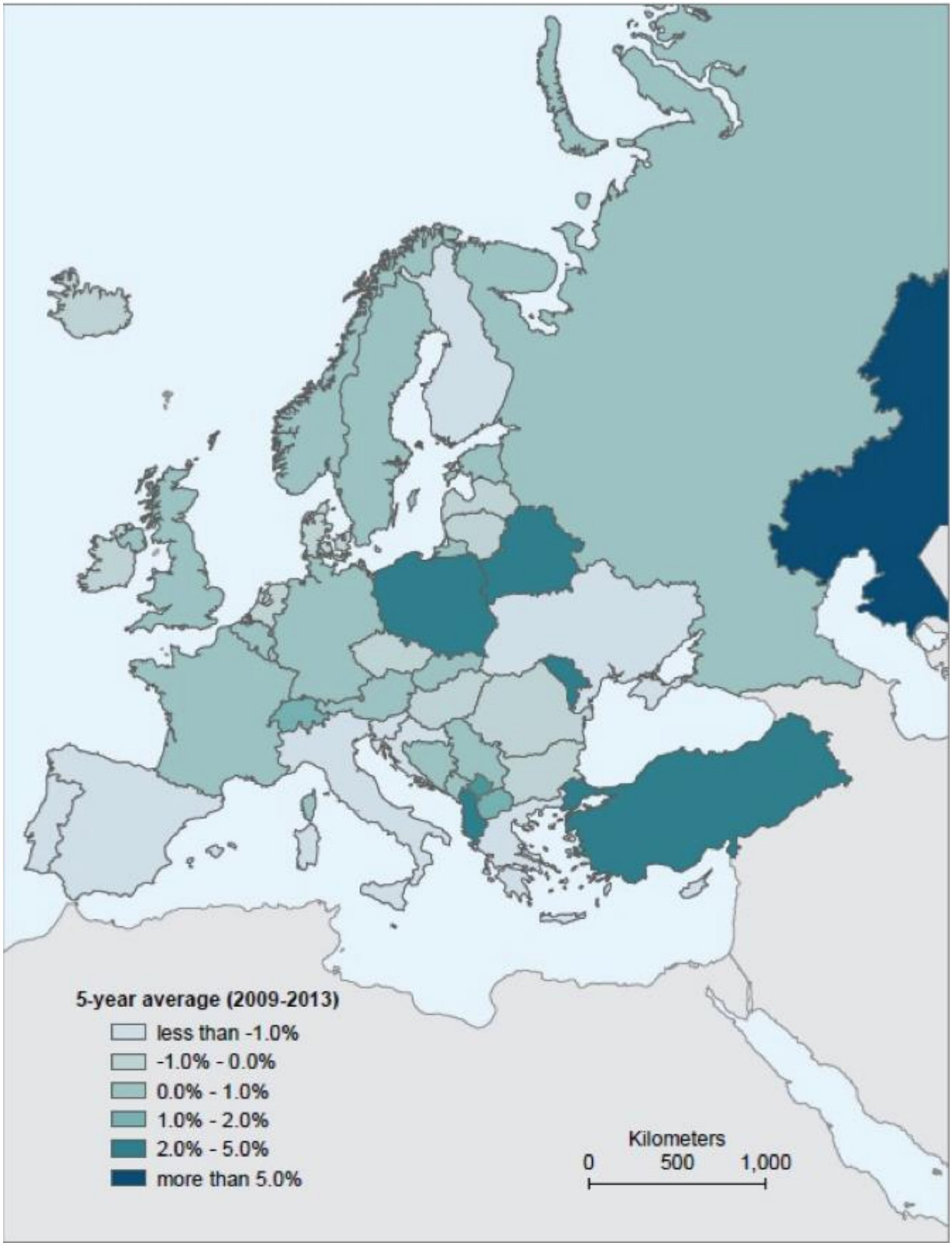
Source: WIIW based on EuroStat and national statistics
Note: shaded cells indicate increase in debt relative to GDP after 2008 crisis.

Table 34: **Foreign direct investment inward stock (in % of GDP)**

COUNTRY	2005	2010	2011	2012	2013
Albania	13.2	27.1	36.7	34.0	29.2
Bosnia and Herzegovina	22.3	39.5	41.6	42.9	42.0
Croatia	33.8	58.3	53.3	54.8	54.0
Greece	n.a.	15.1	12.2	11.4	11.1
Italy	n.a.	19.6	20.7	23.0	23.8
Montenegro	32.0	102.0	100.6	113.3	112.3
Serbia	19.5	56.1	57.1	62.2	61.9
Slovenia	21.0	30.2	31.8	32.6	29.7

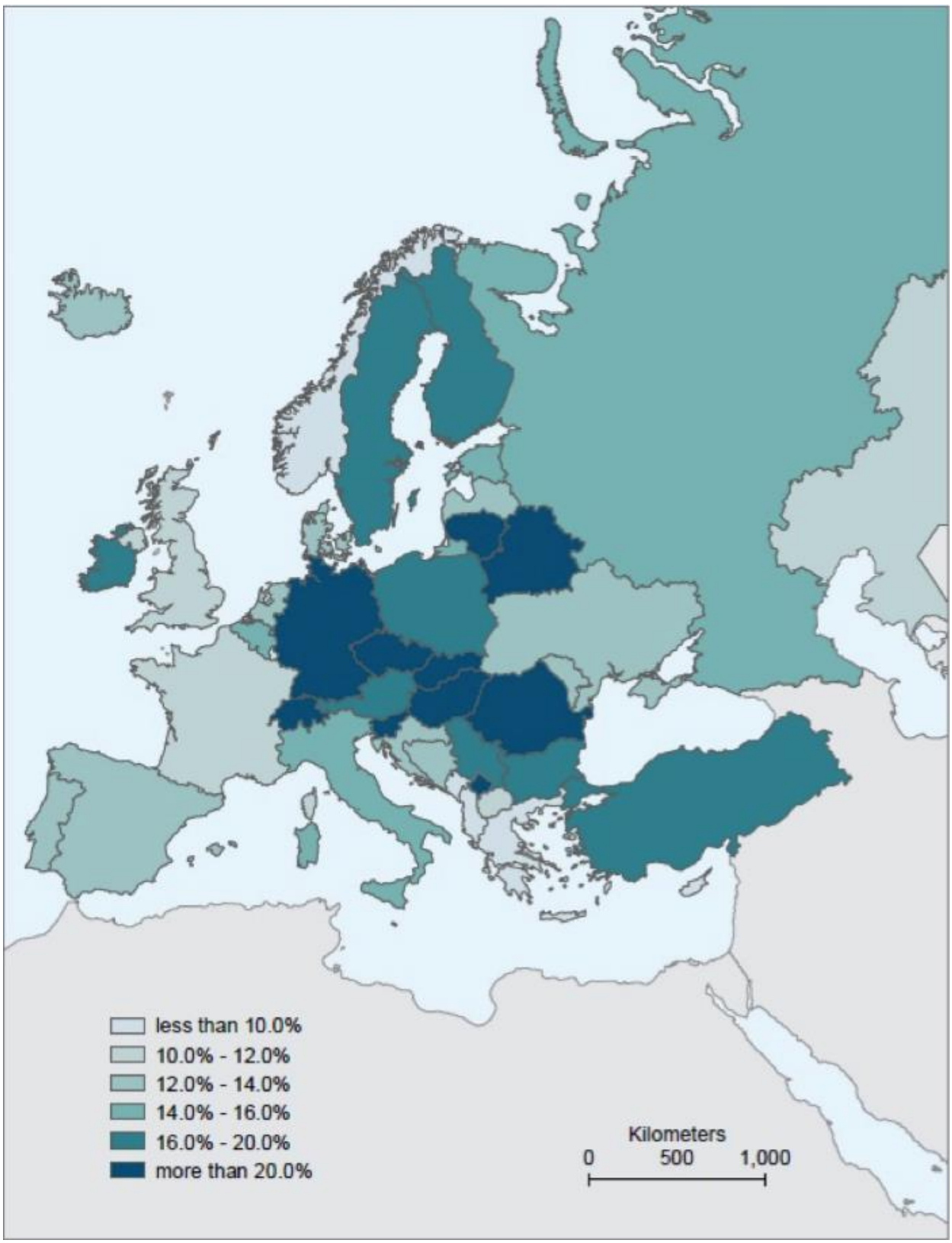
Source: WIIW based on EuroStat and national statistics
Note: shaded cells indicate limited investment inward stock in comparisons with other AIR countries

Map 7: Gross Domestic Product, real growth in %



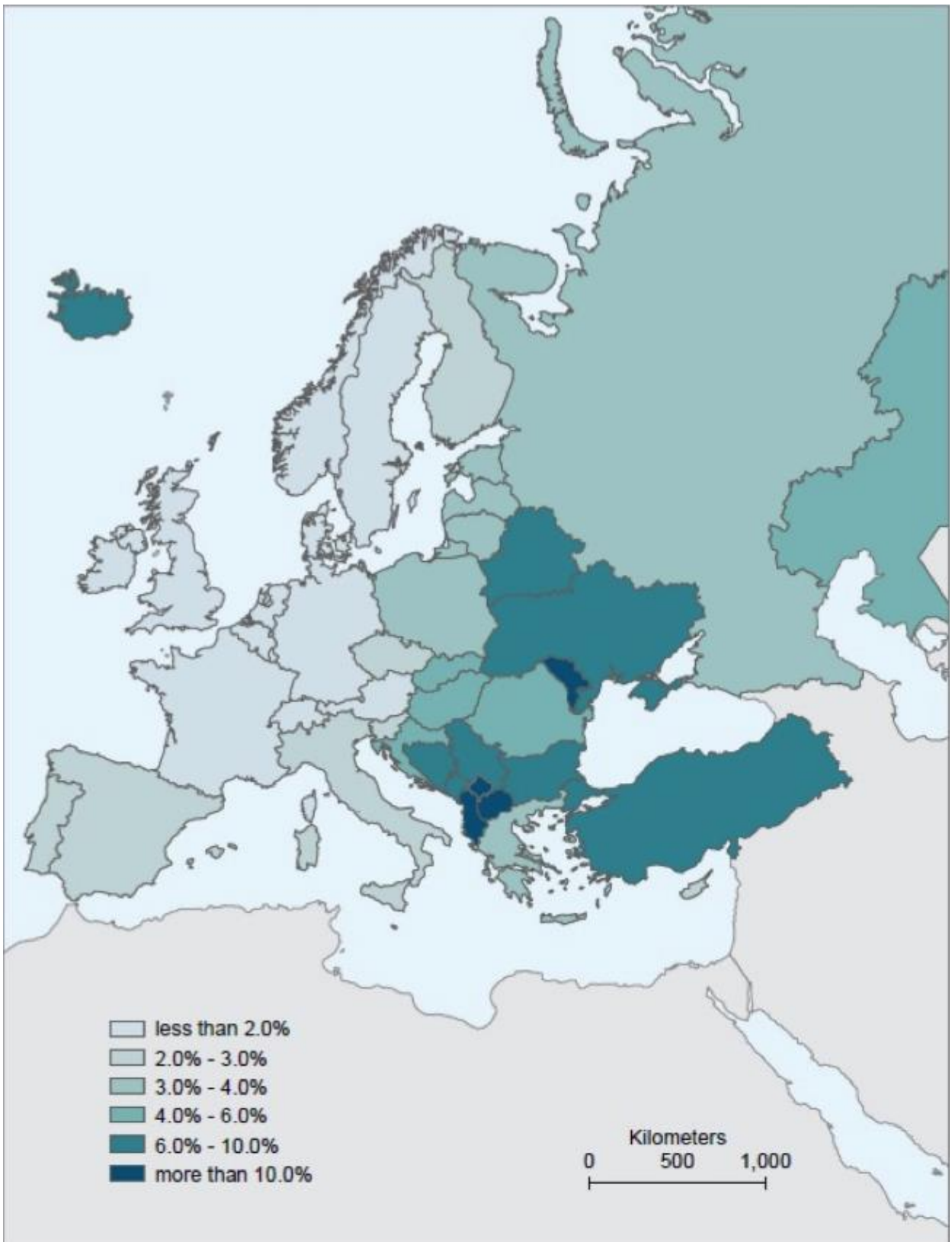
Source: WIIW Annual Database incorporating national and Eurostat statistics

Map 8: Share of manufacturing, in % of GVA, 2013



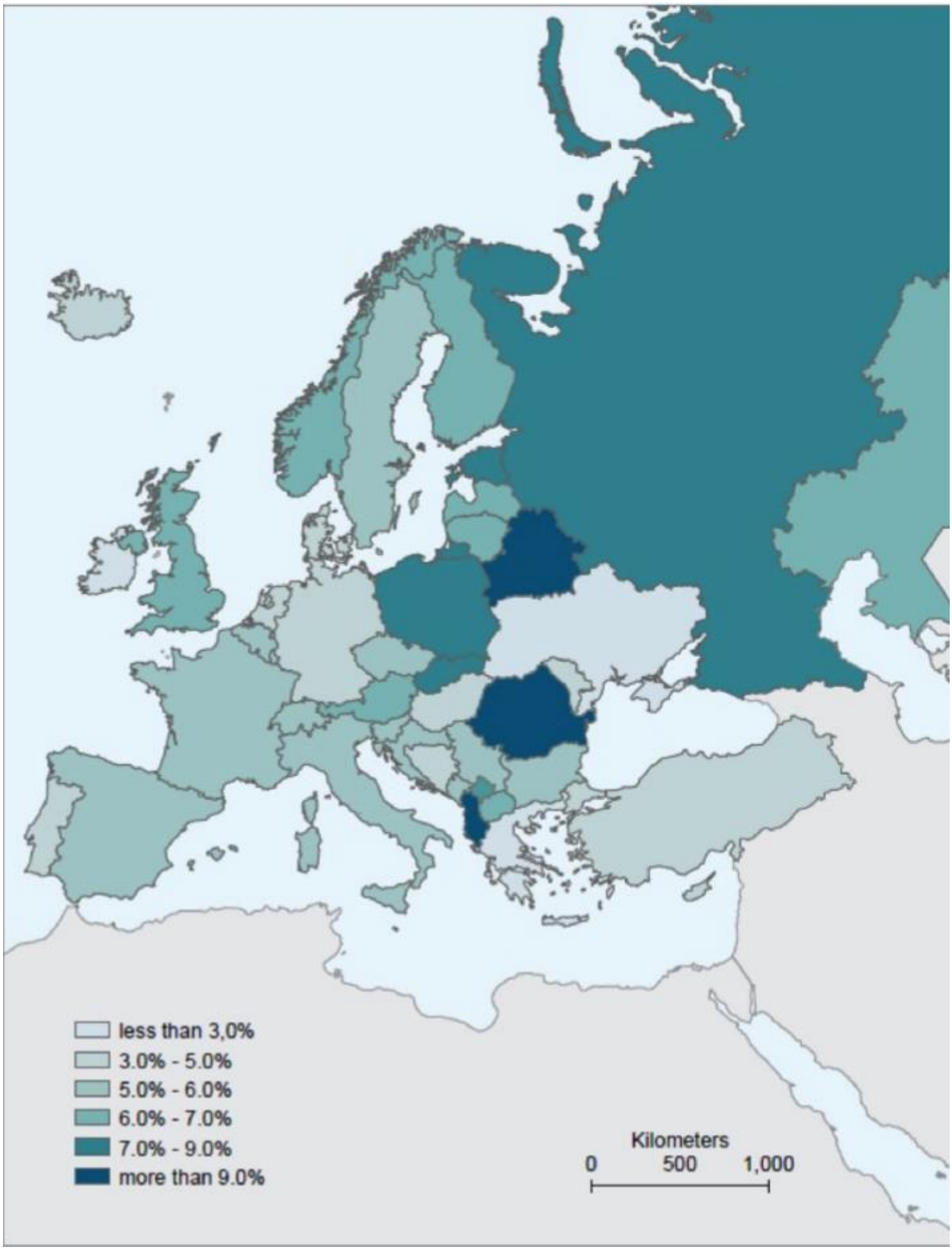
Source: WIIW Annual Database incorporating national and Eurostat statistics

Map 9: Share of agriculture, in % of GVA, 2013



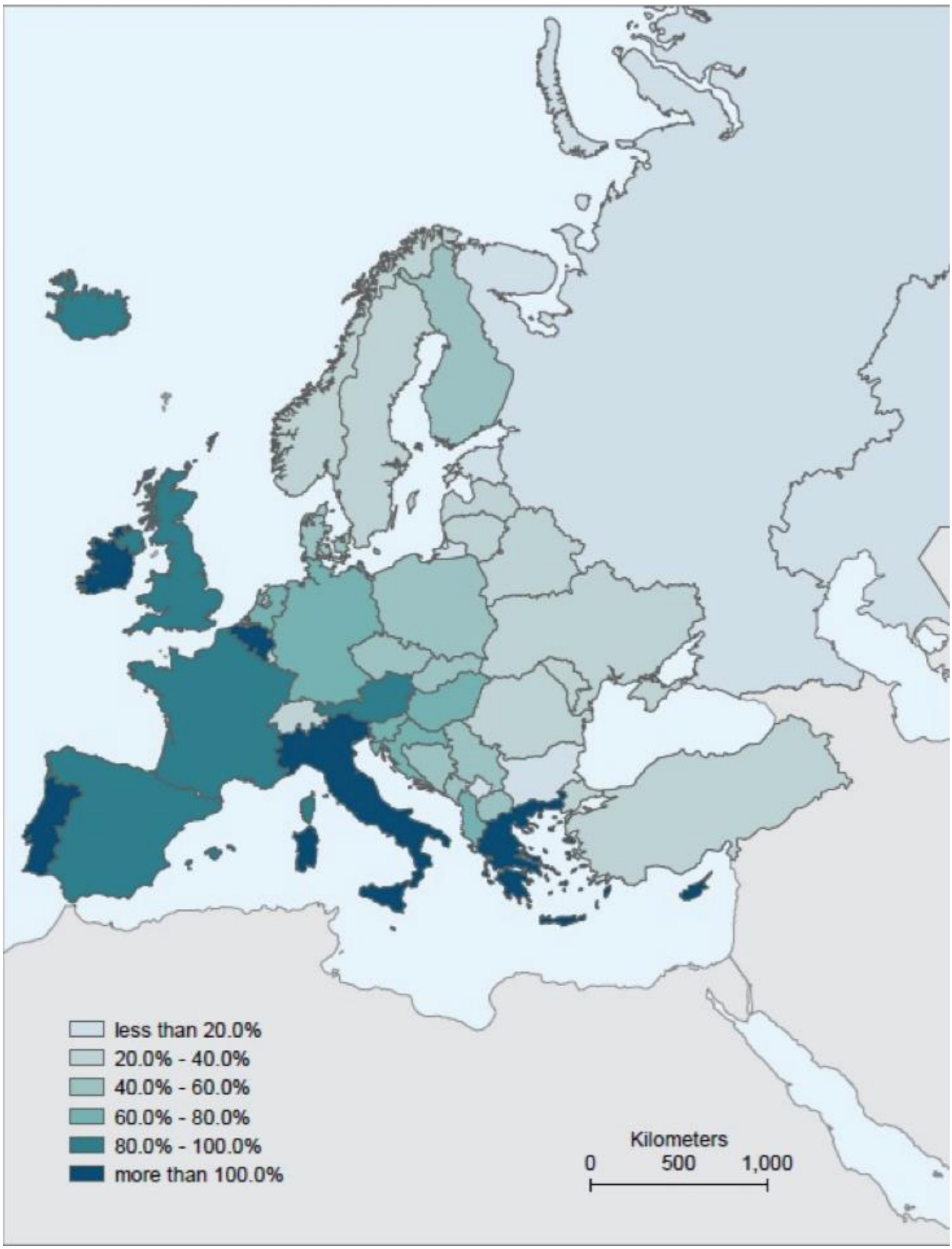
Source: WIIW Annual Database incorporating national and Eurostat statistics

Map 10: Share of construction, in % of GVA, 2013



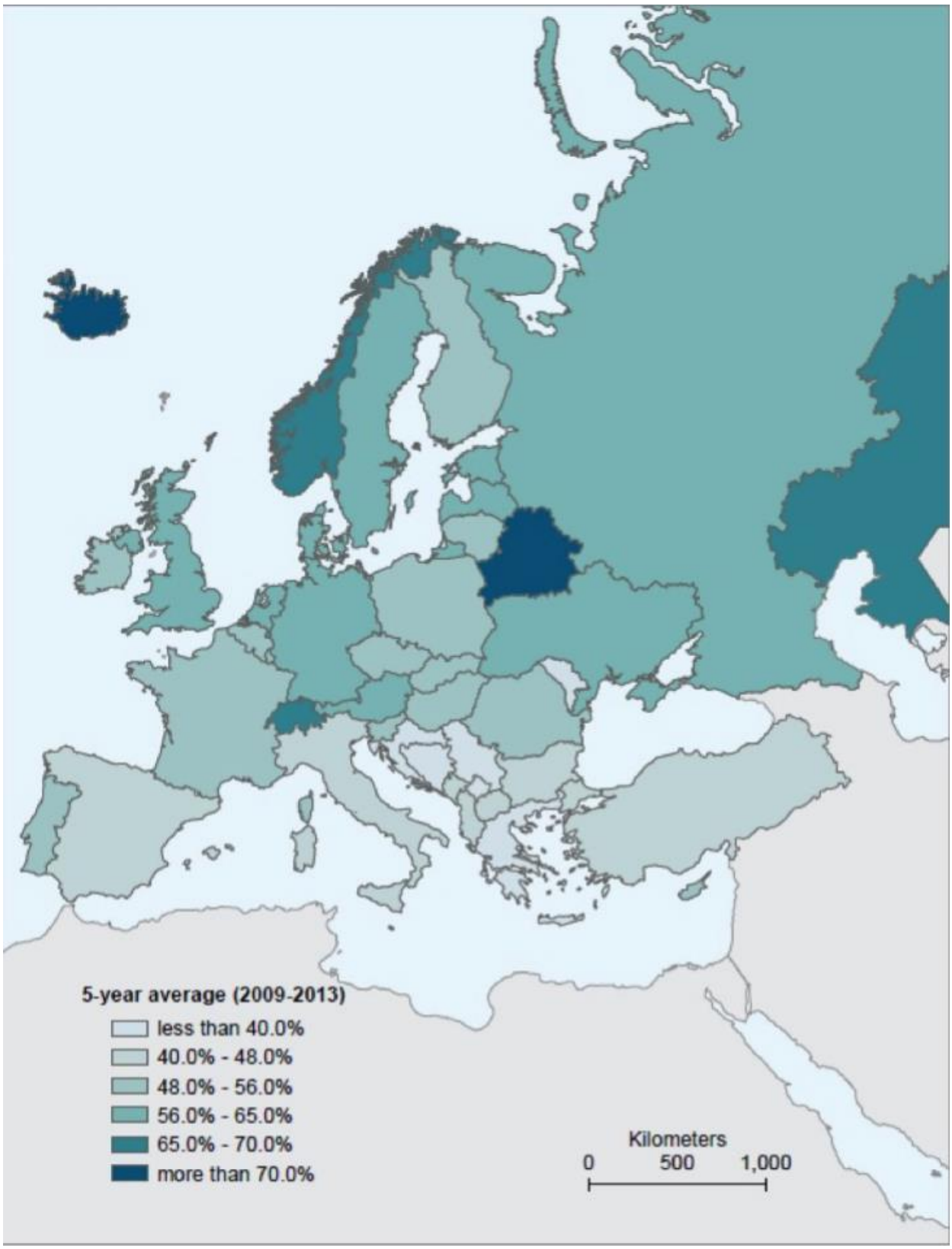
Source: WIIW Annual Database incorporating national and Eurostat statistics

Map 11: General government gross debt, in % of GDP, 2013



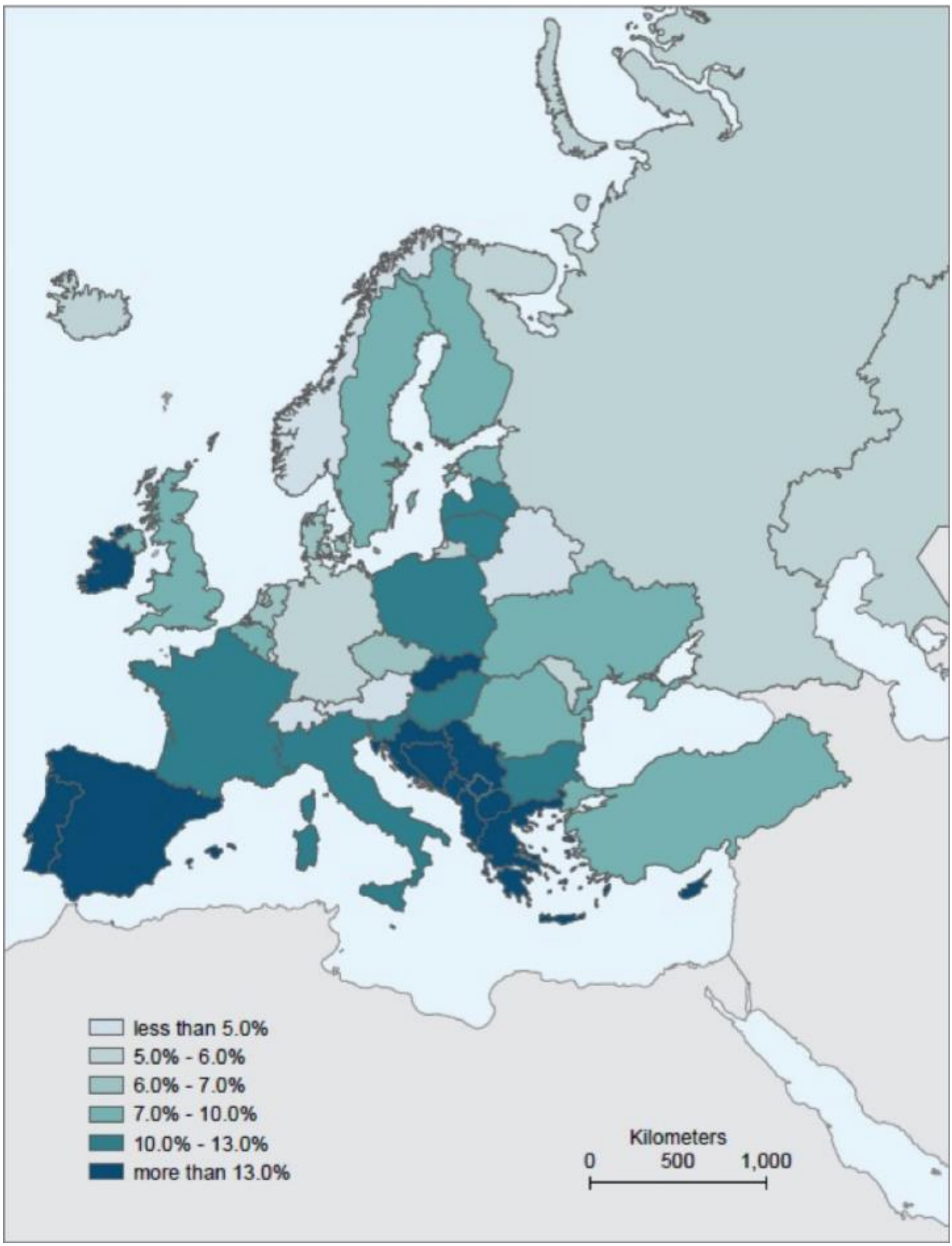
Source: WIIW Annual Database incorporating national and Eurostat statistics

Map 12: Employment rate, in %



Source: WIIW Annual Database incorporating national and Eurostat statistics
Note: based on LFS-data, registration data in Belarus

Map 13: Unemployment rate, in %



Source: WIIW Annual Database incorporating national and Eurostat statistics
Note: based on LFS-data, registration data in Belarus

ANNEX 2: TRANSPORT INFRASTRUCTURE MAPS, TABLES AND FACTS

Map 14: Italian main ports

Source: Assoporti (2014)

In **Friuli - Venezia Giulia** there are two ports, of which Trieste is the most important with significant traffic of tourist ferries, ships and cargo vessels as well as shipyards, an industrial terminal and an oil one, serving the pipeline Trieste-Ingolstadt; the port of Monfalcone is the northernmost of the Adriatic and provides industrial and freight container services.

Trentino - Alto Adige, while far from the sea, is linked with other tourist resorts on Garda Lake by a regular boat line.

The port of Venice in **Veneto** is one of Italy's most important in terms of the volume of commercial/industrial (container, chemical and petroleum products) traffic and one of the most important in the Mediterranean as regards the cruise sector.

While far from the sea, **Lombardia** has an important navigation system related to the presence of large lakes (Maggiore, Como, Garda), rivers and channels, with over 1,000 km of navigable coastline, more than 200 marinas, 8.5 million passengers and 700,000 vehicles ferried each year, 5 ports (including Cremona and Mantova) and commercial docks with more than one million tonnes of cargo handled annually.

In addition to ports on Po river (such as Ferrara and Piacenza[75]), in **Emilia Romagna** Rimini has a tourist port and Ravenna a commercial and industrial harbour.

[75] In progress at the time if writing the study.

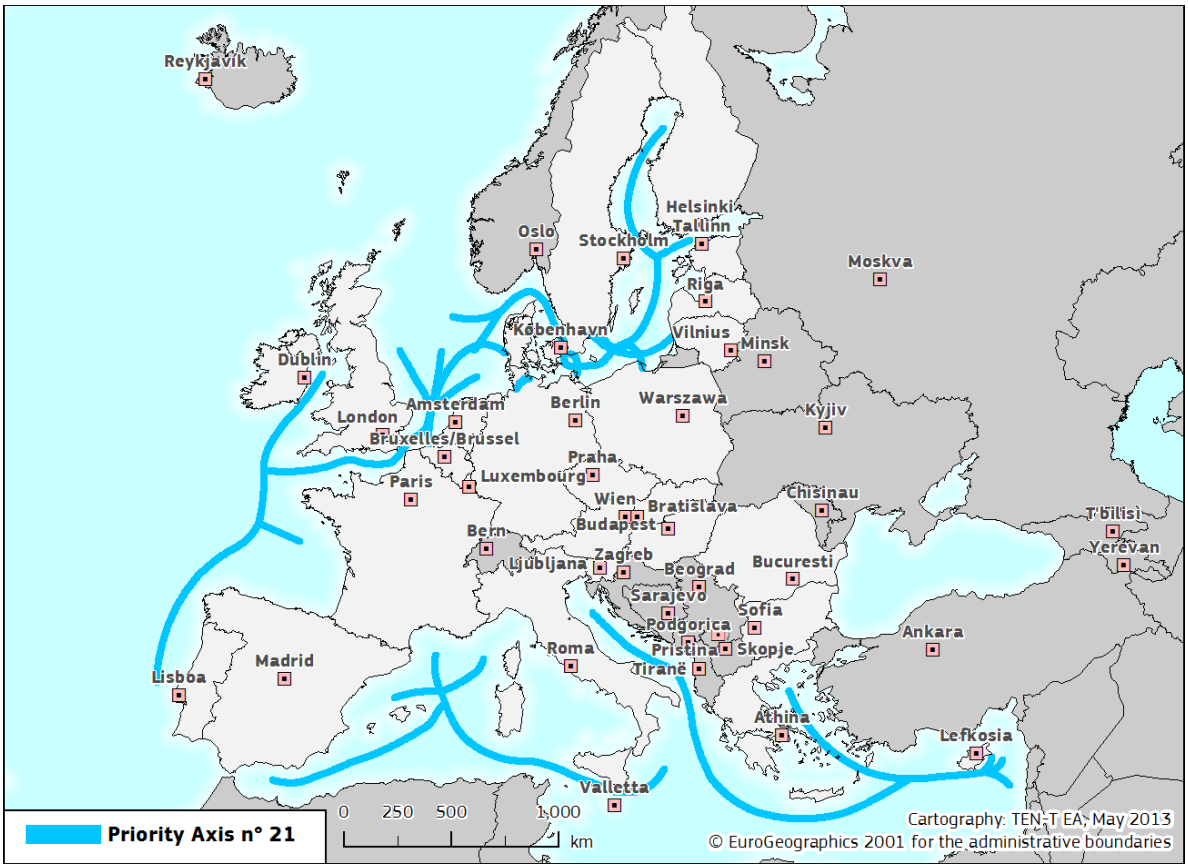
The main harbour in **Marche** is that of Ancona, the largest in Italy in terms of international traffic of vehicles and passengers and one of the most important of the Adriatic in terms of freights.

In **Abruzzo** Pescara is the third largest Italian marina in terms of number of berths, while being also a river port, mostly used for fisheries and aquaculture. Ortona is the largest port, able to support ships of appreciable size and draft and holding a strategic location for the maritime trade of goods.

Termoli is the only port in **Molise**, used for tourism, sport and fishing, and it is the closest to Tremiti Islands.

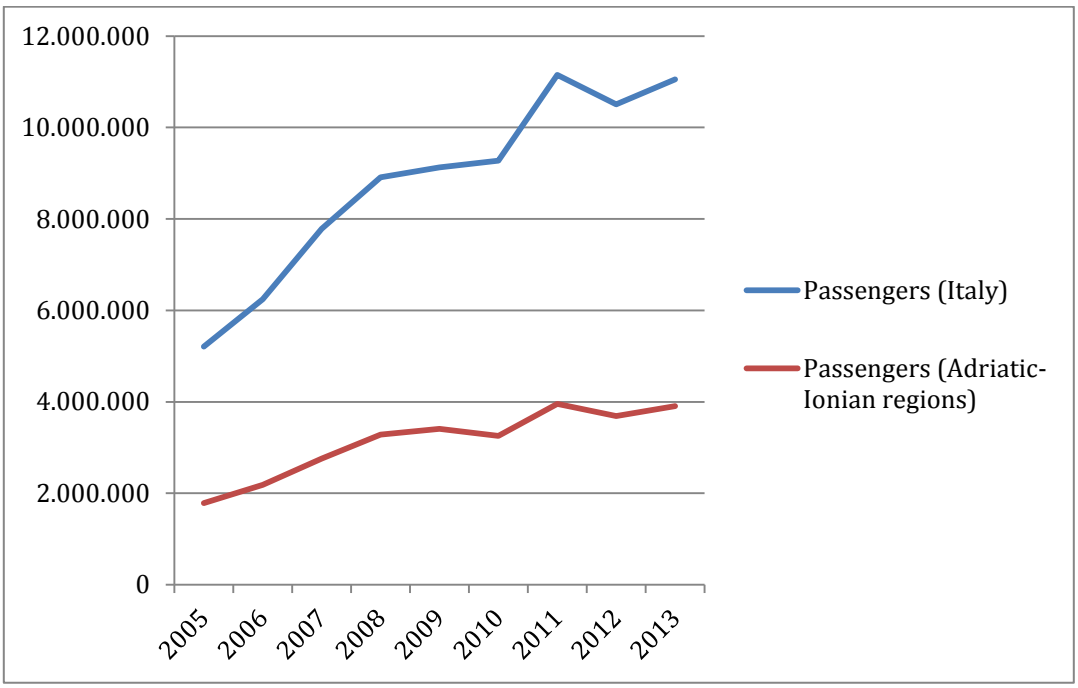
In **Puglia** the port of Bari serves mercantile, commercial and tourist purposes, being equipped with a cruise terminal, with main links to **Albania**, **Montenegro** and **Greece**. The port of Brindisi, of similar profile, is linked also to Turkey. The port of Taranto, mostly military, commercial and industrial, is one of the most important ports in Italy and the Mediterranean and is the second in Italy in terms of volumes of freights, being connected with other Italian ports and those of the Mediterranean, the Middle East and China. A number of other ports are of minor importance and mainly dedicated to tourism and fishing.

Map 15: Motorways of the sea priority axis



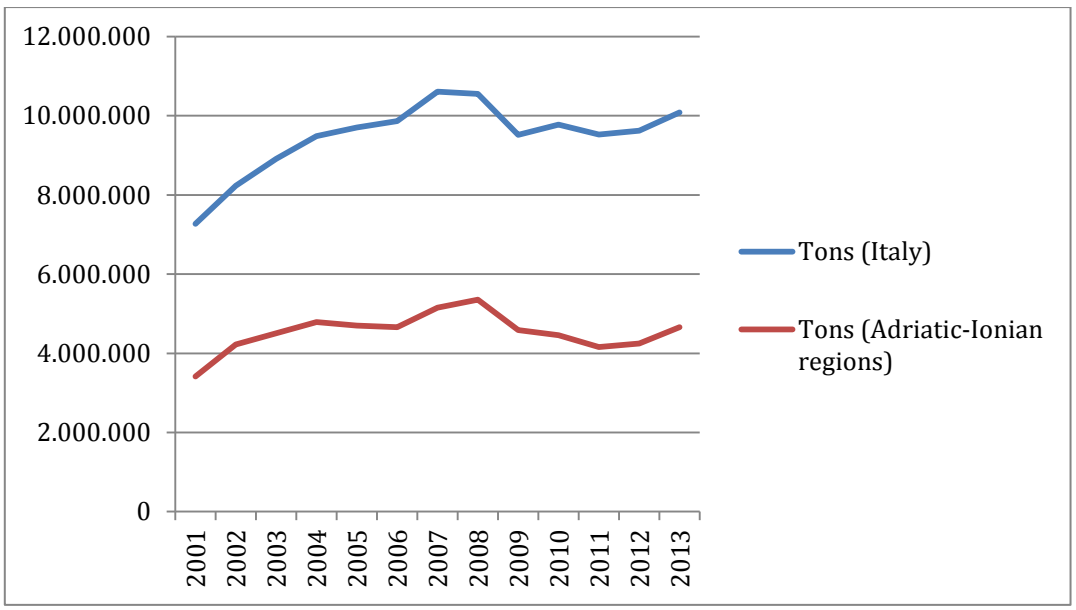
Source: Assoporti (2014)

Figure 10: Passengers traffic throughout the main ports



Source: Assoporti (2014)

Figure 11: Freights traffic throughout the main ports



Source: Assoporti (2014)

The CEF[76] promotes infrastructure development to serve all transport modes. CEF core transport network maps available at:
http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/doc/maps/eu.pdf

On the website of the South East Europe Transport Observatory (SEETO), complementary maps can be consulted: http://www.seetoint.org/
Examples include: maps on South-East Europe Core Road and Airport Network and Core Rail and Ports Network.

[76] Complements http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/doc/maps/eu.pdf

ANNEX 3: ENERGY INFRASTRUCTURE, MAPS, TABLES AND FACTS

Table 35: Average yearly electricity consumption and related growth rates (2012-2020)

Contracting party	2012, GWh	2020, GWh	Average yearly growth rate between 2012-2020 in %
Albania	7 855	10 476	3.7 %
Bosnia and Herzegovina[77]	11 575	15 500	3.7 %
Croatia	17 440	20 938	2.3 %
FYR of Macedonia	8 777	10 573	2.4 %
Kosovo[78]	4 986	6 493	2.8 %
Montenegro	4 262	5 134	2.5 %
Serbia[79]	37 910	42 814	1.5 %

Source: https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/2450177/Energy_Community_Publication_WEB.PDF, page 45

Table 36: Net installed capacities (MW) in 2012

Contracting party	Coal	Natural Gas	Oil	Nuclear	Hydro	RE	Total
Albania[80]	0	0	9	0	1 480	0	1 577
Bosnia and Herzegovina	1 855	0	0	0	2 188	46	4 089
Croatia	330	999	786	398	2 191	180	4 884
FYR of Macedonia	818	280	210	0	538	0	1 846
Kosovo[81]	1 288	0	0	0	46	1	1 336
Montenegro	210	0	0	0	676	0	886
Serbia[82]	3 914	336	0	0	2 883	3	7 136

Source: https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/2450177/Energy_Community_Publication_WEB.PDF, page 45

Table 37: Gas consumption and demand projections (million cubic meters)

Contracting party	2015, mcm	2020, mcm	Average yearly growth rate between 2015 and 2020, %
Albania	10	96	172 %
Bosnia and Herzegovina	478	902	18 %
Croatia	3 830	4 670	4 %
FYR of Macedonia	0	0	0 %
Kosovo	0	0	0 %
Montenegro	2 323	2 579	2 %
Serbia	3 203	3 817	4 %

Source: https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/2450177/Energy_Community_Publication_WEB.PDF, page 47

[77] For Bosnia and Herzegovina (BiH) the estimated growth rate by the TSO is used.
[78] Kosovo communicated new values in March 2013. These were included in the model calculations.
[79] Serbia communicated new values in March 2013. These were included in the model calculations.
[80] Albania communicated new values in March 2013. These were included in the model calculations.
[81] Kosovo communicated new values in March 2013. These were included in the model calculations.
[82] Serbia communicated new values in March 2013. These were included in the model calculations.

Table 38: List of projects of the Energy Community Interest (PECI list)

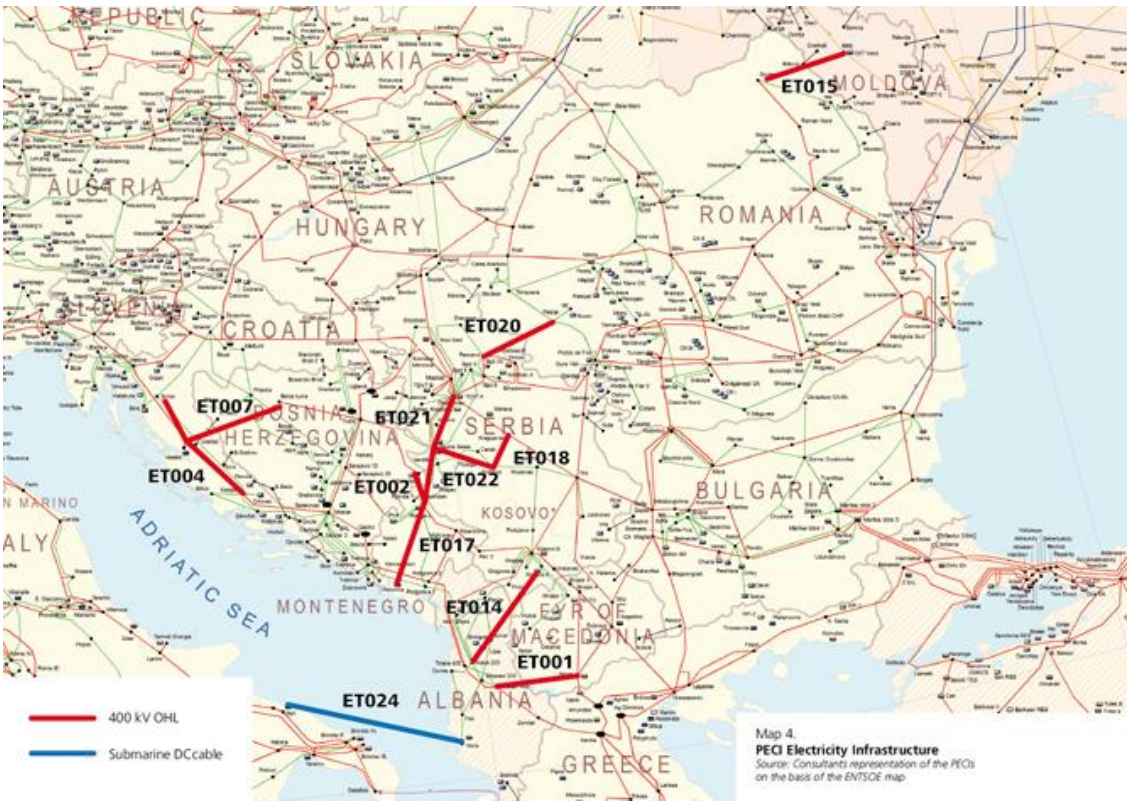
Electricity Generation		
Contracting Party	Project ID	Project
AL	EG038	Hydro Power Plant Skavica
AL	EG001	Wind Park Dajc-Velipoje
BiH	EG027	Combined Heat and Power Plant KTG Zenica
BiH	EG003	Hydro Power Plant Dabar
BiH + HR	EG004	Hydro Power Plant Dubrovnik (Phase II)
BiH +RS	EG002/ EG006	Hydro Power Plants Upper and Middle Drina
Kosovo	EG013	Kosova and Re Power Plant (KRPP)
ME	EG015	Hydro Power Plants Lim River
RS	EG035	Combined Heat and Power Combined Cycle Turbine Plant in Pancevo, Serbia
RS	EG022	Thermal Power Plant Kolubara B
RS	EG024	Thermal Power Plant Nikola Tesla B3
RS	EG017	Combined Heat and Power Plant Novi Sad
RS	EG019	Hydro Power Plants Ibarske (10 HPPs)
RS	EG018	Hydro Power Plants Velika Morava
Electricity Infrastructure		
AL + FYR of MK	ET001	400 kV OHL SS Biltola (FYR of MK) - SS Elbasan (AL)
HR-BiH and HR internal line reinforcement	ET004	400 kV OHL Banja Luka (BiH) - Lika (HR) / 400 kV OHL Brinje - Lika - Velebit - Konjisko oncluding 400 kV substation Brinje
IT - AL	ET024	400 kV OHL SS Vlora - Bari West
Kosovo - AL	ET014	400 kV OHL Tirana (AL) - Pristina (Kosovo)
MD - RO	ET015	OHL Balti (MD) and Suceava (RO)
ME - RS - BiH and ME internal line reinforcement	ET002	400 kV OHL SS Bajina Basta (RS) - Pljevlja (ME) - SS Visegrad (BiH) / 400 kV OHL Pljevlja - Lastva
RS	ET018	400 kV OHL SS Kravujevac - SS Kraljevo
RS	ET021- ET022	400 kV OHL SS Bajna Basta - SS Kraljevo
RS - RO	ET020	400 kV OHL SS Resita (RO) - Pancevo (RS)
Gas Infrastructure		
AL - ME - HR - BiH	G008	Ionian Adriatic Pipeline (IAC)
GR - AL - IT	G022	Trans Adriatic Pipeline (TAP)
AL	G002	EAGLE LNG Terminal
BiH - HR	G006	Interconnection Pipeline BiH - HR
BiH - HR	G003	Interconnection Pipeline BiH - HR
BiH - HR	G007	Interconnection Pipeline BiH - HR
HR	G010- G011	LNG Terminal in Croatia + Pipeline Zlobin - Bosiljevo - Sisak - Kozarak - Slobodnika
HR - RS	G009	Interconnection Pipeline HR - RS (Slobodnika - Sotin - Backo Novo Selo)
RS	G013	Interconnection Pipeline RS (Nis) - BG (Dimitrovgrad)
UA	G021	Modernisation of Urengoy- Pomary - Uzhgorod Pipeline
Oil Infrastructure		
HR	OIL001	Project of Inspection, Evaluation, Rehabilitation, Upgrading and Reconstruction of the existing JANAF Oil Pipeline
UA	OIL004	Construction of the Brody - Adamowo Oil Pipeline

Source: https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/2450177/Energy_Community_Publication_WEB.PDF , page 49-50

Map 16: South-East Europe main electricity plants

Source: Energy Community, https://www.energy-community.org/portal/page/portal/ENC_HOME/AREAS_OF_WORK/Instruments/Investments/PECIs/Maps

Map 17: South-East Europe major electricity infrastructure

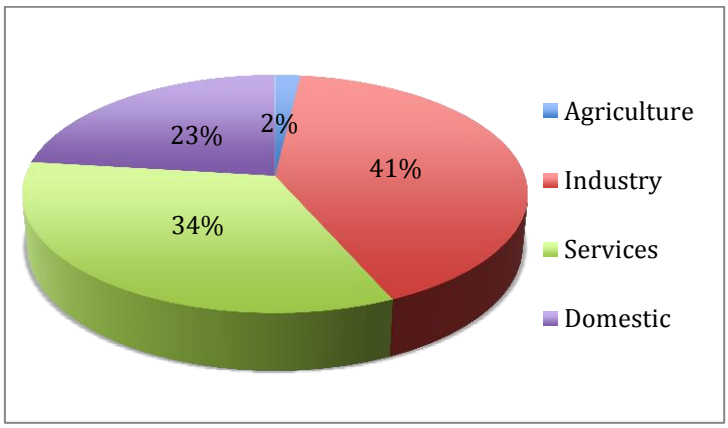


Source: Energy Community, https://www.energy-community.org/portal/page/portal/ENC_HOME/AREAS_OF_WORK/Instruments/Investments/PECIs/Maps

Map 18: South-East Europe Core major gas infrastructure

Source: Energy Community, https://www.energy-community.org/portal/page/portal/ENC_HOME/AREAS_OF_WORK/Instruments/Investments/PECIs/Maps

Map 19: Composition of Italian Electricity Consumption



Source: TERNA S.p.A. (2014)

Table 39: Composition of electricity production in Italian Adriatic and Ionian area

Area	Region	Production (GWh)			
		Hydro	*Thermal*	*Wind*	*Photovoltaic*
North	Lombardia	11 452.9	29 890.9	0.0	1 932.8
	Trentino - Alto Adige	11 136.5	1 244.5	1.2	406.9
	Veneto	4 549.7	11 537.0	10.4	1 728.1
	Friuli - Venezia Giulia	1 791.7	7 166.5	0.0	491.1
	Emilia Romagna	1 177.4	16 055.9	26.4	1 979.0
Center	Umbria	2 116.0	930.2	2.7	519.1
	Marche	690.1	479.6	0.5	1 214.4
South and Islands	Abruzzo	2 147.2	1 436.1	326.3	822.4
	Molise	271.1	1 707.0	683.3	216.8
	Puglia	4.9	29 752.4	3 909.4	3 714.9
	Basilicata	467.6	558.0	712.6	494.4
	Calabria	1 638.6	6 543.8	1 928.8	590.8
	Sicilia	514.7	18 112.2	3 009.5	1 754.0

Source: TERNA S.p.A. (2014)

ANNEX 4: COUNTRIES PARTICIPATING IN THE EUSAIR

The **Republic of Albania** gained independence from the Ottoman Empire in November 1912. It is a parliamentary democracy with a unicameral Parliament, President and the Government. Albania is organised into 12 counties, as well as 375 municipalities and communes, including the capital city of Tirana.

Bosnia and Herzegovina gained independence in March 1992 following separation from the Socialist Federal Republic of Yugoslavia. It is a parliamentary democracy based on its constitution (as of 14 December 1995) that was included into the Dayton Peace Accords. Ever since the constitution has been amended several times. The national Government has limited powers. Bosnia and Herzegovina has 4 tiers of governance: state, entity, canton and municipal levels. Two second level administrative units (Federation of Bosnia and Herzegovina, organised into cantons and municipalities and Republika Srpska, organised into municipalities) have their own Constitutions, Parliaments and Governments. Brcko District is a self-governing administrative unit under the sovereignty of Bosnia and Herzegovina. The National Parliament is bi-cameral, Parliament of Federation of Bosnia and Herzegovina is bi-cameral while Republika Srpska comprises unicameral legislature. The Capital City of Sarajevo is administratively divided between Federation of Bosnia and Herzegovina and Republika Srpska.

Croatia became independent from the former Yugoslavia on 25 June 1991. Croatia is a unitary state, with a unicameral parliamentary system, and with three levels of governance: central (national) level, "regional" level with the 20 Counties plus the City of Zagreb and finally, the local level with the 429 Municipalities and 126 Towns. The (capital) City of Zagreb has a special status, as it is both a Town and a County. Croatia underwent a decentralisation process that started in 2001 when certain functions and responsibilities were transferred from the national to the local level. Croatia became member of the EU in 2013.

Greece has been independent since 1830 (from Ottoman Empire) while its parliamentary democracy was re-established in 1974 after seven years of military dictatorship. The legislature comprises a unicameral Parliament (Hellenic Parliament). The administrative organisation includes 12 regions and one autonomous monastic state (aftonomi monastiki politeia - Mount Athos). The Regions are arranged according to Hellenic tradition and cover both continental territory and islands. The capital city is Athens and it is located in the Attica region.

Italy is a parliamentary republic composed of Municipalities, Provinces, Metropolitan cities, Regions and the State. The country is subdivided into 15 regions with an ordinary status, adopted and modified by regional law (Abruzzo, Basilicata, Calabria, Campania, Emilia-Romagna, Lazio, Liguria, Lombardy, Marche, Molise, Piedmont, Apulia, Tuscany, Umbria, Veneto) and 5 regions with a special autonomous status, adopted by constitutional law (Friuli-Venezia Giulia, Sardinia, Sicily, Trentino-South Tyrol (autonomous provinces of Trento and Bolzano/Bozen), Aosta Valley). Furthermore there are 110 provinces and 8,057 municipalities. The Parliament is bicameral and it is composed of the Chamber of and the Senate.

The **Former Yugoslav Republic of Macedonia** gained its independence peacefully from Yugoslavia in 1991. Greece's objection to use of what it considered a Hellenic name and symbols delayed international recognition, which occurred under the designation of "the Former Yugoslav Republic of Macedonia." The country has a unicameral Parliament with 123 seats (120 members directly elected in constituencies and 3 directly elected in diaspora). The Head of State is the President of the Republic and the government is led by

a prime minister. Macedonia comprises 70 municipalities including the capital city of Skoplje.

Montenegro was recognised as independent country in 1878 at the Congress of Berlin. It was absorbed into Yugoslavia after World War I and gained independence in June 2006. The legislature comprises a unicameral Parliament with 81 seats elected in a single nationwide constituency by proportional representation vote. Montenegro is organised into 23 municipalities including the capital city of Podgorica.

Serbia was established as a republic following breakdown of the Socialist Federal Republic of Yugoslavia, independence of Montenegro in 2006 and the Kosovo declaration of independence in 2008. The Status of Kosovo is governed by UN SC Resolution 1244 while the constitution of Serbia considers Kosovo as integral part of the country. Serbia's legislature comprises a unicameral Parliament with 250 seats (members directly elected in a single nationwide constituency by proportional representation). Serbia is organised into 122 municipalities and 23 cities of which 39 municipalities and 6 cities compose the autonomous province of Vojvodina. The capital city of Belgrade has a special status and comprises 17 municipalities.

Slovenia is a parliamentary republic composed of 193 municipalities that includes 11 urban municipalities of which the capital city of Ljubljana is the largest one. The national administration of Slovenia includes 58 decentralised ministerial offices. Until 25 June 1991 Slovenia had been a part of the Socialist Federal Republic of Yugoslavia and it has been an independent country since then. There is no regional governance system in Slovenia and municipalities remain the most important territorial administrative units. Slovenia became member of the EU and NATO in 2004. The parliament is bicameral and it consists of the National Council (40 seats) and the National Assembly (90 seats; including two members directly elected to represent Italian and Hungarian minorities).

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