Report on the long-term economic viability of constructing new electricity capacities for electricity exports in the Western Balkan countries

MACEDONIA COUNTRY REPORT

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Inspiring Energy

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1. Introduction

The Western Balkans (Albania, Bosnia and Herzegovina, Kosovo[1], Macedonia[2], Montenegro and Serbia) is a region that has experienced significant economic development in the past decade. Economic development is fuelled by increased electricity[3] demand. Several countries in this region have been short on electricity production and experienced difficulties in satisfying their domestic demand. Almost all governments in the Western Balkans have plans to extend their electricity generation capacity to meet their demand, but they also demonstrate the ambition to become electricity exporters.

When countries expand their electricity generation capacity at the same time with a view to provide electricity to the region, this creates the clear and present danger of excess supply and stranded assets. Stranded assets are commonly conceptualized as assets that become uneconomic to operate. In the context of the energy industry Caldecott and McDaniels[4] define stranded assets as plants that became uneconomic to operate, since "their marginal cost of generation exceeds the price for electricity".

Several factors influence the creation of stranded assets. These include changes in regulation (for example the introduction of more stringent environmental production standards) and changes in the market (e.g. market increases in the costs of coal or a price decline due to strong competition).

This report analyses the long-term electricity supply and demand patterns of countries in the Western Balkans and examines their export prospects from a stranded assets perspective for each country (Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Montenegro, Serbia). It does so by:

(1) comparing the current (and future) electricity production to the current (and future) electricity demand;
(2) examining peak electricity supply and demand;
(3) comparing the (expected) export capacity with the demand of potential customers in the (1) Western Balkans, (2) neighbouring countries, (3) the EU Member States, and (4) the EU Member States, Ukraine and Turkey.

This report consists of six independent country studies. Each country study therefore contains all relevant information, such as methodology, approach, data description etc.

1 Throughout this report, this designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence

2 According to the UN, the official name for Macedonia is "The former Yugoslav Republic of Macedonia". In this study it is referred to as "Macedonia".

3 Electricity is frequently referred to as 'Energy'. This report only examines electricity. In this report these terms are used interchangeably

4 Ben Caldecott & Jeremy McDaniels: Stranded generation assets: Implications for European capacity mechanisms, Energy Markets and Climate Policy, Working Paper, January 2014, p. 5, http://www.smithschool.ox.ac.uk/research-programmes/stranded-assets/Stranded%20Generation%20Assets%20-%20Working%20Paper%20-%20Final%20Version.pdf

1.1 Management Summary

Countries in the Western Balkans (Albania, Bosnia and Herzegovina, Kosovo[5], Macedonia, Montenegro and Serbia) have frequently faced difficulties in satisfying domestic electricity demand. Almost all governments in the Western Balkans have plans to extend their electricity generation capacity to meet their demand but they also demonstrate strong export ambitions.

This report analyses the long-term electricity supply and demand patterns of countries in the Western Balkans and examines their export prospects from a stranded assets perspective for each country. It does so by:

(1) comparing the current (and future) electricity production to the current (and future) electricity demand;
(2) examining peak electricity supply and demand;
(3) comparing the (expected) export capacity with the demand of potential customers in the Western Balkans, neighbouring countries, the EU Member States, and (4) the EU Member States, Ukraine and Turkey.

The report shows that the countries will be short in electricity if they merely complete the 'likely future capacity' extensions. If they realize the 'planned future capacity' extensions, however, all countries and hence the region will be 56% long in 2024, entailing that the national plans demonstrate significant export ambitions. In particular Bosnia Herzegovina could turn into the largest exporter (up to 20.000 GWh), followed by Serbia (18.000 GWh). The other countries in the Western Balkans have a much lower contribution (Montenegro 2000 – 5000 GWh, Macedonia 2000 GWh, Albania 2000 GWh, Kosovo 2.500 GWh) to the overall long position of the region, but measured in terms of their domestic demand, their export potential is substantial.

In order to determine the long and short positions of the countries in the Western Balkans the electricity power balance has to be analysed. This balance examines the actual feed-in of electricity and the demand situation in the Western Balkans when the electricity feed-in reserves are at their presumed minimum and the electricity demand is at its presumed maximum. Subject to the caveat relating to the robustness of the underlying data, this enables the identification of critical electricity supply situations. The overall finding is that all countries are unable to satisfy their peak demand when considering existing capacity and 'likely future capacity' extensions. Only Bosnia and Herzegovina is temporarily able to do so. When 'planned future capacity' is considered, Bosnia and Herzegovina (as of 2018), Montenegro (as of 2021) and Serbia (as of 2022) are able to satisfy peak demand. Examining the Western Balkans jointly, the report shows that cooperation between the countries in the region can help to enhance supply security in the region.

Such significant electricity capacity expansions designed to meet export demand create the clear and present danger of becoming dependent upon the export market. The export analysis shows that there will not only be competition within the Western Balkans (here in particular between Serbia and Bosnia and Herzegovina) but also from other (supra-) regional competitors such Bulgaria, Romania and the EU. Given the expected excess supply in Europe, increased competition may put pressure on export prices and increase the risk of incurring stranded assets. For this reason, it is suggested to closely

5 Throughout this report, this designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence

examine investments that are directed to serve export markets and to also consider the trade-off of producing or buying electricity.

This report shows that countries in the Western Balkans do require good regional ties in the area of energy policy. The current infrastructure should therefore be examined from this perspective. Importantly this report shows that the examined countries do have strong electricity export ambitions that create the danger of stranded assets if the domestic electricity expansion decisions are made without taking due account of developments in other countries in the Western Balkans and beyond. Decisions to make or buy electricity should thus be taken in a strategic fashion that also takes due account of energy security considerations.

The table below summarizes key data of this report:

				Albania	Bosnia and Herzegovina	Kosovo	Macedonia	Montenegro	Serbia
Demand in 2024		Min	GWh	10.985	13.800	7.135	10.083	3.381	36.120
		Max	GWh	13.834	16.294	8.622	12.269	4.999	42.298
Supply in 2024		Min	GWh	6.292	15.583	4.114	8.356	2.429	34.127
		Max	GWh	12.779	33.061	9.611	14.617	5.393	52.796
Net Position in 2024		Min	GWh	-7.542	-3.028	-4.508	-3.913	-2.570	-8.171
		Max	GWh	1.794	19.260	2.467	4.534	2.013	18.671
Peak Demand in 2024		Min	MW	2.266	2.315	1.456	1.892	586	6.600
		Max	MW	2.746	2.734	1.679	2.302	815	7.354
Supply Capacity in 2024		Min	MW	711	2.096	523	636	460	5.064
		Max	MW	1.003	4.475	1.332	1.975	643	7.893
Export Potential	Western Balkan	Min	GWh	-46.955	-29.488	-46.273	-44.215	-46.736	-30.078
		Max	GWh	22.191	26.706	25.225	25.820	27.163	21.563
	Region	Min	GWh	-20.702	-3.235	-20.019	-17.961	-20.483	-3.824
		Max	GWh	48.445	52.959	51.479	52.074	53.417	47.816
	W. Balkan and EU	Min	GWh	-64.710	-47.243	-64.027	-61.969	-64.491	-47.832
		Max	GWh	4.437	8.951	7.471	8.066	9.409	3.808
	incl. UKR and TU	Min	GWh	-40.324	-22.857	-39.642	-37.584	-40.105	-23.447
		Max	GWh	60.318	64.832	63.352	63.947	65.290	59.689
Grid and Distribution Losses 2013			%	≈47	≈13	≈36	≈18	≈23	≈17
Renewables Share in 2024		Min	%	93	30	3	17	64	30
		Max	%	100	41	15	28	75	34

2. Country Report Macedonia

2.1 Introduction

This country report is a self-contained subset of the 'Report on the long-term economic viability of constructing new electricity capacities for electricity exports in the Western Balkan countries' that was commissioned by CEE Bankwatch and realized by the University of Groningen and The Advisory House.[6] The background of this study is that almost all governments in the Western Balkans[7] have plans to extend their electricity generation capacity to meet their demand, but they also demonstrate the ambition to become electricity exporters. Over investments in excess electricity generation capacity can give rise to stranded assets – assets that become uneconomic to operate since their marginal cost of generation exceeds the price for electricity. [8]

This country report examines Macedonia's energy generation[9] and its import/export potential. It examines if a potential excess production of energy would be likely to be met by demand of potential buyers in the region and beyond. Moreover the study presents how the energy mix in Macedonia will develop over time.

This report is structured as follows: section 2 presents the approach and methodology. Section 3 presents the data. Section 4 presents the analysis and section 5 the conclusions.

Before commencing, a general caveat is in order. This report is based on official documents and predictions provided by the respective governments, power supplier or network operators. Given the scope of this research this report does not engage in the analysis of the legal framework nor does it seek to determine future price levels[10]. Similarly, current transport and grid capacities do not fall within the scope of this study and we do not incorporate effects that may arise from grid or transport restrictions.

2.2 Approach and Methodology

In order to identify the long-term viability of the present and future electricity capacity changes in Macedonia and its export potential, this study

- compares the current (and future) electricity production to the current (and future) domestic electricity demand and identifies short and long positions (Analysis section 1); and

6 Authors of this report are Stefan Weishaar, University of Groningen, and Sami Madani, The Advisory House

7 Countries belonging to the Western Balkans are: Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Montenegro, Serbia

8 Ben Caldecott & Jeremy McDaniels: Stranded generation assets: Implications for European capacity mechanisms, Energy Markets and Climate Policy, Working Paper, January 2014, p. 5, http://www.smithschool.ox.ac.uk/research-programmes/stranded-assets/Stranded%20Generation%20Assets%20-%20Working%20Paper%20-%20Final%20Version.pdf

9 Electricity is frequently referred to as 'Energy'. This report only examines electricity. In this report these terms are used interchangeably

10 This report does thus not extend to costs of energy production and input prices or wholesale prices or the like

- compares the (expected) export capacity with the demand of potential regional customers (countries in the Balkans, Ukraine, and Turkey) and supra-regional customers (EU Member States) (Analysis section 2).

The development of the energy mix is presented subsequently (Analysis section 3).

2.2.1 Macedonia's Supply/Demand analysis

Based upon Macedonia's specific historic production and import/export figures we determine the national net electricity supply/demand position. In order to account for future developments we also analyse the supply/demand position with regard to the generation capacity that is presently under construction or planned. Based on the current existing plants, current construction projects and construction projects that are planned, we develop four electricity supply scenarios. The first three scenarios are based on current official reports. Scenario 4 is based on a current Draft Energy Strategy of Macedonia until 2035 [MK-01] which had to be included into the analysis because there are substantial differences in the planned future capacity extensions (see data description).

#	Scenario	Description
1	**Existing capacity**	Calculates the net position based on current supply and demand figures
2	**Likely future capacity**	Calculates the net position based on existing capacity (Scenario 1) and an estimation of additional supply facilities that are under full construction or near starting construction
3	**Planned future capacity**	Calculates the full net position based on Scenario 2 and includes the envisaged electricity production.
4	**Draft projections**	Supply scenario based on the Draft Energy Strategy of Macedonia until 2035 [MK-01]

Table 1 – Macedonia's electricity supply scenarios

The differentiation between 'likely future capacity' and 'planned future capacity' has been established by CEE Bankwatch. Determinants for differentiating between the two categories are whether construction permits have been granted, whether the constructors are identified and if the financing has been secured.

After obtaining results for electricity generation in Macedonia, we need to examine domestic demand before we can determine the national net long/short positions. We apply a robustness check in the form of three different electricity consumption scenarios. This robustness check is necessary since we seek to extrapolate electricity demand patterns over a period of 10 years and since changes in demand patterns severely affect Macedonia's ability to export electricity.

#	Scenario	Description
1	**Low**	According to the strengthened Energy efficiency scenario the consumption growth in Macedonia growth

		until 2020 with an average annual rate of 2.2%, Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p.7
2	**Medium**	Base scenario based on final electricity consumption growth until 2002 with an average annual rate of 2.64%, Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p.7
3	**High**	The high growth scenario is based on the medium growth scenario to which the difference between the low and medium scenario was added

Table 2 – Macedonia's electricity demand scenarios

The low and medium scenarios were selected to provide for comparability between our report and existing reports and to enhance stakeholder acceptability. The high consumption growth scenario was selected with the same range between the low demand growth and the baseline scenario to allow for a robust energy policy in case of high consumption demand growth.

The net long/short position of Macedonia is calculated by subtracting high, medium and low consumption demand from each of the four electricity supply scenarios. Macedonia's exporting ability is thus determined for all twelve combinations.

In order to determine the long and short position of Macedonia we also analyse the electricity power balance. This balance examines the actual feed-in of electricity and the demand situation at a particular point in time when the electricity feed-in reserves are at their presumed minimum and the electricity demand is at its presumed maximum. Subject to the caveat relating to the robustness of the underlying data, this enables the identification of critical electricity supply situations. This method should thus be used as an indication only[11].

Data for the hourly peak demand (hourly load values) during the period 2007 – 2013 is taken from Entso-E [MK-03]. We determine the peak hourly demand for each year (2007 – 2013) and forecast the remaining years (2014 – 2024).

Because the values between the historic data (2007 – 2013) and the future data (2014-2024) can differ[12] we need a starting point for our peak demand forecast that also includes information from 2014. We therefore apply the following formula:

The peak load for 2014 is calculated as follows:

$$P_{2014} = \frac{D_{2014}}{\text{Average}(D_n, D_{n-1}, D_{n-2})} * \text{Average}(P_n, P_{n-1}, P_{n-2})$$

where:
D represents the demand in the given year,
P is the peak load
And n is the next year before 2014 where data is available, normally 2013.

11 Net operators calculate the demand peaks in general for the 3rd Wednesday of each month. In our report, we deviate from this policy and determine the hourly peak demand on an annual basis

12 Historical data shows the actual produced electricity while the future data is based on planned volumes

The peak load for year n is calculated as follows

$$P_n = \frac{D_n}{D_{n-1}} * P_{n-1}$$

where:
D represents the demand in the given year,
P is the peak load
And n is the year after 2014.

We multiply this ratio with the average peak of 2011 – 2013 to determine the hourly peak demand for 2014. The peak demand is then forecasted with the growth rate that underlies the low-, medium-, and high demand scenario.

The peak energy supply (for all of the above supply scenarios) is calculated by multiplying the electricity generation capacity of those power plants that are base load capable with a parameter that reflects the supply security and availability of the electricity generation capacity. The data we use applies an in-feed supply security of 99% as a critical benchmark.[13]

Due to lack of information regarding the particular power plants and electricity networks, we are unable to account for required system reserves, revisions, and planned and unplanned outages and have to rely upon data from Germany.[14] Since for the purpose of this analysis the annual peak demand and peak supply is essential and only lasts for a short moment, we only consider the unplanned outages that cannot be time shifted beyond a period of 12 hours.[15] Based on historic supply statistics on these immediate unplanned outages in Germany we obtained parameters for expected base load supply.

Our data set does not distinguish between lignite and coal power plants. We selected the value for lignite since in the Balkans a lot of lignite is available.

Oil/gas is presumed not to be base load capable because of practices of short term supply contracts and unpredictable policy developments that may endanger the supply security with gas.

The data for wind and solar power exhibit low values because these technologies are not base load capable.

Hydropower is regarded to only have a limited base load capacity. Despite significant historic variability in the hydropower electricity generation in the Balkans, it is evident

13 Bericht der deutschen Uebertragungsnetzbetreiber zur Leistungsbilanz 2013 nach EnWG §12 Abs. 4 und 5, 30.09.2013, available at http://www.bmwi.de/BMWi/Redaktion/PDF/J-L/leistungsbilanzbericht-2013,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf

14 We thereby follow Bericht der deutschen Uebertragungsnetzbetreiber zur Leistungsbilanz 2013 nach EnWG §12 Abs. 4 und 5, 30.09.2013, available at http://www.bmwi.de/BMWi/Redaktion/PDF/J-L/leistungsbilanzbericht-2013,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf

15 We thereby follow Bericht der deutschen Uebertragungsnetzbetreiber zur Leistungsbilanz 2013 nach EnWG §12 Abs. 4 und 5, 30.09.2013, available at http://www.bmwi.de/BMWi/Redaktion/PDF/J-L/leistungsbilanzbericht-2013,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf

that hydropower plants were able to produce electricity in a stable manner. We therefore do not follow the German report (prescribing 25%)[16] but use 40%.[17]

The net long/short position of peak hourly demand and supply for Macedonia is calculated by subtracting high, medium and low hourly demand from each of the peak electricity supply scenarios.

Type	Planned Availability
Lignite	93,5%
Coal	94%
Gas/Oil	0%
Biomass	65%
Wind	1%
Photovoltaic	0%
Hydropower	40% (instead of 25%)
Pump storage	80%

Table 3 – Estimated power plant planned availability per type

2.2.2 Macedonia's export analysis

The regional analysis examines export opportunities for electricity produced in the scenario countries. We thus compare the possible long position of Macedonia against the possible long/short positions of its trading partners.

The examined trading partners will be 1) in the Western Balkan region (i.e. the case study countries), 2) regional (i.e. countries adjacent to the case study countries) and supra-regional, i.e. other EU Member States (3) and in the EU, Ukraine and Turkey (4). In order to estimate the import potential of the recipient countries the long/short positions of these countries must be determined.

The following countries have been included in the export analysis:

#	Group	Countries included
1	**Western Balkans**	Albania*, Bosnia and Herzegovina*, Kosovo*, Montenegro*, Serbia*
2	**Region**	Group 'Western Balkans' and countries adjacent to the case study countries: Bulgaria, Croatia, Greece, Hungary, Italy, Romania, Slovenia
3	**Western Balkans and EU**	Group 'Western Balkans' and the EU-28 countries
4	**Western Balkans and EU incl. Ukraine and Turkey**	Group 'Western Balkans and EU' and Ukraine and Turkey*

*: Trading partners with different scenarios in this study

Table 4 – Export analysis' groups for Macedonia

16 http://www.bmwi.de/BMWi/Redaktion/PDF/J-L/leistungsbilanzbericht-2013,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf

17 We calculated the regional average of hydropower generation capacity (excluding pump storage plants) by dividing total hydro power supply 2014 by total installed hydropower capacity (excluding pump storage plants) multiplied by 24 (hours) and 365 (days) = 7297GWh / 25447GWh ≈ 40%

Data for the case study countries is based upon the net long and net short positions in the respective country analysis contained in this report. Data has been obtained from a Study of the European Commission[18] the Turkish Electrical Energy 10-Year Generation Capacity Projection (2009 – 2018)[19] and the IEA and the Energy Strategy of Ukraine.[20] Since the data in the EU report is based on PRIMES that models on the basis of 5 year intervals, we connected the interim years by means of linear approximation.

Given that any forecasting inherently involves uncertainty we need to consider the range of possible outcomes – both at the supply side of Macedonia and its potential customers (group 1 to 4).

In order to reflect the range of possible import and export demand of the trading partners included in the respective analysis, we examine the lowest and the highest values for the respective years. In terms of the country analysis contained in this report we take the net long/short position of the 'current supply' (scenario 1) and 'high demand growth scenario' as a low estimate and the supply scenario 3 and low demand growth scenario as an estimate for the high import/export value.[21] For the EU and Ukraine we included one scenario each. For Turkey we included a high and low electricity demand scenario.

This approach enables us to identify possible trading partners in the various groups that would be in demand of the electricity produced by Macedonia. The analysis also offers an overview over the range of possible outcomes and hence allows decision makers to gain insights into the 'riskiness' of investments in the electricity sector. Hence this analysis enables an assessment of the potential risk that investments turn into 'stranded assets'.

Given that electricity investments are generally regarded as long term investments we have selected three evaluation points at the beginning (2014), in the middle (2019) and at the end (2024) of the period under examination to compare Macedonia's import/export capabilities with those of its trading partners.

2.2.3 Macedonia's energy mix

This section will present the evolution of the energy mix in Macedonia based on the electricity supply scenarios.

18 EU Commission, EU Energy, Transport and GHG Emissions Trends to 2050, Reference Scenario 2013, Appendix 2, p. 85 ff.

19 Turkish electricity Transmission Corporation, Turkish Electrical Energy 10-Year Generation Capacity Projection (2009 – 2018), 2009, Energy Demand Balance 2009-2018, (Case I-A) High Demand – Scenario 1, p. 44 and Project Generation Capacity and Energy Demand Balance 2009-2018 (Case II-A), Low Demand – Scenario 1. Approximation from 2018 onwards based on -9684,6x + 82780 (high demand) and -7259,3x + 77896, low demand (year 2009 represents 1)

20 IEA, Key World Energy Statistics, 2012, p. 27 and Energy Strategy of Ukraine for the period through 2035, p. 24, Annex 2. Since only values for 2012 and 2035 were available, values in between have been approximated linearly

21 We use supply scenario 3 because supply scenario 4 lies below scenario 3

2.3 Data description

We obtained historic (2007 – 2013) production (total production) and consumption data (consumption total) for Macedonia from Entso-E's [MK-03] 'Detailed Monthly Production (in GWh)' data set.

Production forecasts for the period 2014-2023 for the various power plants were obtained from the Statement on Security of Supply – Republic of Macedonia [MK-04] and from ELEM [MK-05]. Data for 2024 is prolonged based on 2023 data.

The lignite thermal power plants (Bitola 1, 2, 3 and Oslomej) and the heavy crude oil thermal power plant TPP Negotino are about to enter their final period of their life cycle of around 40 years and consequently this should also be reflected in our data set (see Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 14 and Statement on security of supply – Republic of Macedonia [MK-04] p. 29 and 30). However, due to inconsistencies within the Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] on p. 111ff. and 161 ff., where the Oslomej plant continues to generate electricity till 2022, we assume that the Oslomej plant will not be decommissioned before 2022. The energy strategy has apparently been adapted. Similarly according to the Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 159 ff. the plant Bitola 1's decommissioning is time shifted from 2021 to 2023. This is reflected in the data set[22].

TPP Negotino II is expected to be reconstructed and it is envisaged to produce different and increasing quantities of electricity in accordance with various scenarios contained in the Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 161. For 2030 TPP Negotino II is reported to be able to produce 2132 GWh in 2030. We assume that the power plant will already be able to produce 2132 GWh in 2024, which is the year it is envisaged to commence operations.

Using the same logic, we expect TPP Negotino to deliver up to 1308 GWh (Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 111'), TPP Mariovo II to produce 2137 GWh (Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] 161 ff.) and Bitola 4 to produce 2210 GWh (Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] 161 ff.).

The construction of HPP Boskov Most appears to be delayed. It was originally envisaged to be operational by 2015, and then rescheduled to 2017 or early 2018. Since it is expected to take 4 years for construction and works have not yet commenced, we assume operation will only start in 2019 (see Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 39).

HPP Cebren is part of a pump storage complex and we assume it produces on average 54 GWh net (840 GWh of turbine minus 786 GWh of pump) electricity annually during peak demand as of 2019 (see Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 39).

The HPPs in the Vardar valley (Babuna, Zgropolci, Gradsko, Kukurecani, Krivolak, Dubrovo, Demir Kapija, Miletkovo, Gavato, Gevgelija) appear to be at the pre-feasibility study stage of the project development cycle and are not contained in the Strategy for

22 According to Draft energy strategy of Macedonia until 2035 [MK-01] TPP Negotino and TPP Oslomej will be decommissioned on a later date. This is not taken into account in this study

Energy Development in the Republic of Macedonia until 2030 [MK-02]. We therefore assume that the realization of any power plant would take at least 5 years. The HPPs would thus not commence operations before 2020.

The TPP Oslomej has been reported to generate 500 GWh per year between 2014 – 2019 (see Statement on Security Supply – Republic of Macedonia [MK-04] p. 30). Yet in the Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 111 ff., the Oslomej power plant is reported to be capable of producing up to 677 GWh. We therefore use this figure in our report.

CHP Energetika Skopje is reported to produce 160 GWh (see Statement on Security Supply – Republic of Macedonia [MK-04] p. 31). However, in the Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 160, it is reported that CHP Energetika is capable of producing 2197 GWh. We included this figure in our data set.

Data for wind park Bogdanci was taken from ELEM[23].

We obtained the projected consumption demand from the Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 102 and p. 159. We used the baseline scenario as the medium growth scenario and the 'strengthened Energy Efficiency' (Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p. 104 and p. 160) as our low growth scenario. We derived the high cost scenario by computing the annual differences between the low growth and medium growth scenario and adding these to the medium growth scenario.

Supply scenario 4 had to be included because the Draft Energy Strategy of Macedonia until 2035 [MK-01] differs in several respects from the currently available official reports.

The Draft Energy Strategy of Macedonia until 2035 [MK-01] p. 44 and 77 reports that HPP Crn Kamen and other small hydropower plants will generate 106 GWh as of 2020. We included this in supply scenario 4.

HPP Boskov Most is presumed to commence operations one year later, thus in 2020 rather than 2019 (See Draft Energy Strategy of Macedonia until 2035 [MK-01] (p. 47).

The hydropower plants Gradec, Cebren and Veles are reported to commence operations several years later. Gradec and Cebren will commence in 2033, and Veles in 2027 (See Draft Energy Strategy of Macedonia until 2035 [MK-01] p. 65). The TPP Bitola 4 and Mariovo will commence operations only in 2033 (See Draft Energy Strategy of Macedonia until 2035 [MK-01] p. 45, p. 74 following). TPP Negotino 2 is not mentioned at all in the Draft Energy Strategy of Macedonia until 2035 [MK-01].

It also bears mentioning that the latest Draft Energy Strategy of Macedonia until 2035 [MK-01] presents on p. 46, 62 and 63 several new wind power, CHP biomass, TPP biogas, geothermal and photovoltaic energy capacity extensions. These do, however, only have an indication as to the installed capacity in MW but not to the electricity that will be produced per annum. We are therefore unable to incorporate these in our data

23 ELEM (2012), Windpark Project, p. 4, available at http://www.elem.com.mk/images/stories/objekti/1_Windpark_Ang.pdf

set. Given that the total amount of installed capacity is limited, we do not expect that this will impair the general findings of this report.

Electricity supply scenario 4 is based on the Draft energy strategy of Macedonia until 2035. Because the time shifting of the HPPs and TPPs significantly reduces the electricity generation capacity of Macedonia, supply scenario 4 lies below supply scenario 3.

We obtained the projected consumption demand from the Strategy for Energy Development in the Republic of Macedonia until 2030 [MK-02] p.7, taking the strengthened energy efficiency scenario as a low growth scenario and the base scenario as our medium growth scenario. The high consumption growth scenario was selected with the same range between the low demand growth (2.2%) and the baseline scenario (2.64%) to allow for a robust energy policy in case of high consumption demand growth.

As described above, data for the hourly peak demand (hourly load values) during the period 2007 – 2013 is taken from Entso-E [MK-03]. We determine the peak hourly demand for each year (2007 – 2013) and forecast the remaining years (2014 – 2024).

For the export analysis data has been obtained from several sources. For the case study countries data was obtained from this report. For the EU it has been taken from the EU Energy, Transport and GHG Emissions Trends to 2050, from the Reference Scenario 2013, Appendix 2, p. 85 ff.. The data for Turkey is taken from the Turkish electricity Transmission Corporation's report on the Turkish Electrical Energy 10-Year Generation Capacity Projection (2009 – 2018), 2009. In particular data is taken from the Electricity demand Balance 2009 – 2018, (Case I-A) High Demand – Scenario 1, p. 44 and Project Generation Capacity and Electricity demand Balance 2009 – 2018 (Case II-A), Low Demand – Scenario 1. It is adapted to suit our needs by means of an approximation from 2018 onwards based on -9684,6x + 82780 (high demand) and -7259,3x + 77896, low demand (year 2009 represents 1). Data for Ukraine is taken from the IEA's Key World Energy Statistics, 2012, p. 27 and from the Energy Strategy of Ukraine for the period through 2035, p. 24, Annex 2. Because only values for 2012 and 2035 were available, they have been approximated in a linear fashion.

2.4 Analysis

This section of the report describes relevant data observations and findings. First, the supply and demand analysis is presented (subsection 1). This section also examines the net long and short positions as well as peak electricity demand and supply. Subsection 2 presents the export analysis and subsection 3 presents the energy mix.

2.4.1 Supply and Demand

The figures below present the supply and demand patterns for Macedonia, showing the historic and future supply patterns (for existing capacity, likely future capacity, planned future capacity and the draft projections) in relation to each of the growth scenarios (low, medium and high growth).

Regarding the historical (2007 – 2013) supply and demand pattern, it is evident that Macedonia has not covered its demand domestically and has been importing significant amounts of energy. At times only 20% of its energy consumed has been imported (e.g. in 2009) while in other years imports amounted to 30% (in 2013).

A significant difference between the actual historical data (2007 – 2013) and the installed production capacity in Macedonia (as of 2014) can be observed. Possible domestic energy supply more than doubles from 2013 to 2014. This strong increase is explained by the difference between actual production presented by the historic data and the maximum capacity considered as of 2014. Specifically, this marked increase is largely attributable to the gas power plants ENERGETIKA Skopje (2197 GWh per year) and the Combined Cycle Cogeneration Power Plant TE-TO – Skopje (2011) (1800 GWH). But also the capacity increase of the Bogdanci wind park (100 GWh as of 2015) contributes to this increase.

This marked increase transforms Macedonia from a large energy importer to a country with tremendous energy export capacity (more than 40% of its own electricity consumption in 2014 in case of the low consumption demand scenario).

Due to the decommissioning of the TPP Negotino oil power plant after 40 years of operation, 1308 GWh of production capacity is phased out in 2018. The lignite power plants Oslomej (677 GWh) and Bitola 1 (1467 GWh) will be phased out and not be in operation in 2023 and 2024 respectively. This explains the downturn in the projected energy supply of Macedonia in those years.

It also bears mentioning that the supply scenarios 1 (existing capacity) is very comparable to supply scenario 2 (likely future capacity) because only the Wind Park Bogdanci phase 2 (installed 13.8 MW) is currently being planned (37 GWh as of 2016).

At the low growth electricity consumption scenario Macedonia will be able to maintain excess capacity and hence export electricity up until 2023 in supply scenarios 1 (current capacity) and 2 (currently under construction). If, by contrast, all planned future capacity (scenario 3) would be built, Macedonia would strongly increase its export capacity. In scenario 4, however, Macedonia would be in a short position as of 2024.

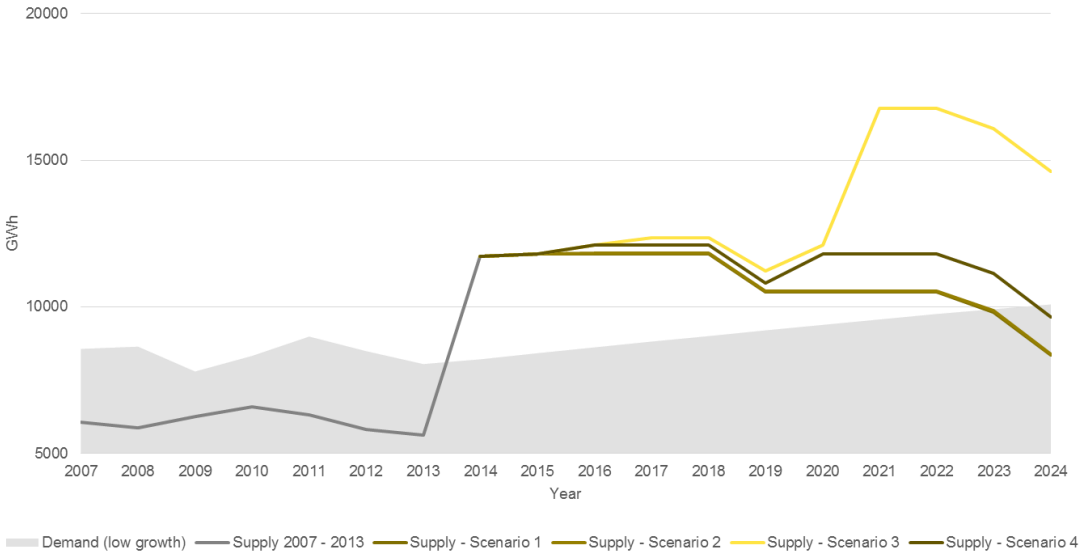

Figure 1 – Macedonia – Supply/Demand – Low Growth

Also in the case of medium consumption growth, Macedonia would turn into a significant exporter of electricity if all planned future capacity (supply scenario 3) was realized. The completion of the currently constructed plants (supply scenario 2) would entail that Macedonia would have a balanced demand and supply pattern during the years 2019 – 2021 and would become a net importer of energy as of 2021/2022. In case none of the power plants currently under construction were to be realized (supply scenario 1), Macedonia would turn into an energy importer in 2021 and in case of supply scenario 4 the country would turn into an importer as of 2023.

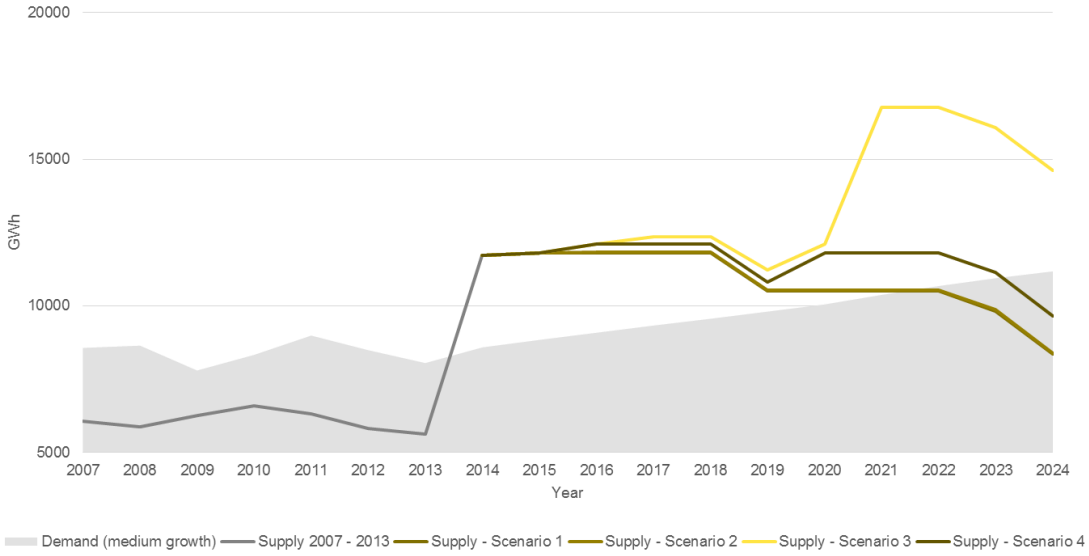

Figure 2 – Macedonia – Supply/Demand – Medium Growth

In the figure presenting high electricity consumption demand in Macedonia, it can clearly be seen that production scenarios 1 and 2 are not sufficient for satisfying Macedonia's electricity demand beyond 2019/2020. In the case of scenario 4 (based on the Draft Energy Strategy of Macedonia until 2035 [MK-01]), Macedonia would be net-short as of 2022/2023. This figure also shows that even in the case of high domestic electricity consumption growth, the realization of all of future planned capacity expansions (or equivalent capacity extensions) would lead to a substantial increase of its exporting capacity after 2020.

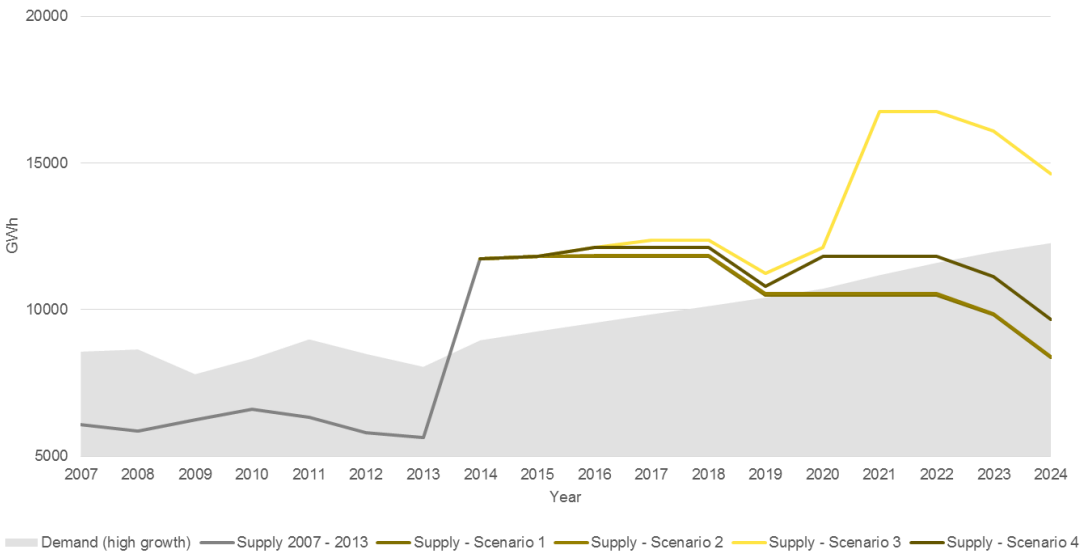

Figure 3 – Macedonia – Supply/Demand – High Growth

2.4.1.1 Net Position

After examining the general supply and demand patterns, we examine the net long and net short position of Macedonia. For each of the electricity consumption growth scenarios (low, medium and high growth) we examine the net positions in relation to the energy supply changes (existing capacity, likely future capacity, planned future capacity and the draft projections).

The marked difference between actual historic production figures (2007 – 2013) and maximum production capacity (2014 and beyond) can clearly be seen in the figures below. As indicated above, this increase is largely attributable to the gas power plants ENERGETIKA Skopje (2197GWh per year) and the Combined Cycle Cogeneration Power Plant TE-TO – Skopje (2011) (1800 GWH) as well as to the Bogdanci wind park (100 GWh as of 2015).

In case of the low consumption growth scenario it is apparent that the electricity generation capacity decline relating to the decommissioning of the TPP Negotino oil power plant (1308GWh) in 2018, the lignite power plants Oslomej (677 GWh) in 2023 and Bitola 1 (1467 GWh) in 2024, strongly contribute to Macedonia turning into an importer towards the end of the examined period. The net import figure clearly shows that the current plant construction (production scenario 2) is insufficient to overpower the effect of this phase out of production capacity. Realizing all of the planned capacity expansions (supply scenario 3) (or comparable electricity production capacity measures) would lead to a strong over-compensation of the generation capacity decline due to the decommissioning of plants and would entail that Macedonia maintains a large exporting capacity of around 44% of its projected demand in 2024. If the draft capacity extensions in the Draft Energy Strategy of Macedonia until 2035 [MK-01] were realised (scenario 4), Macedonia would not be an exporting country but a net importer in 2024.

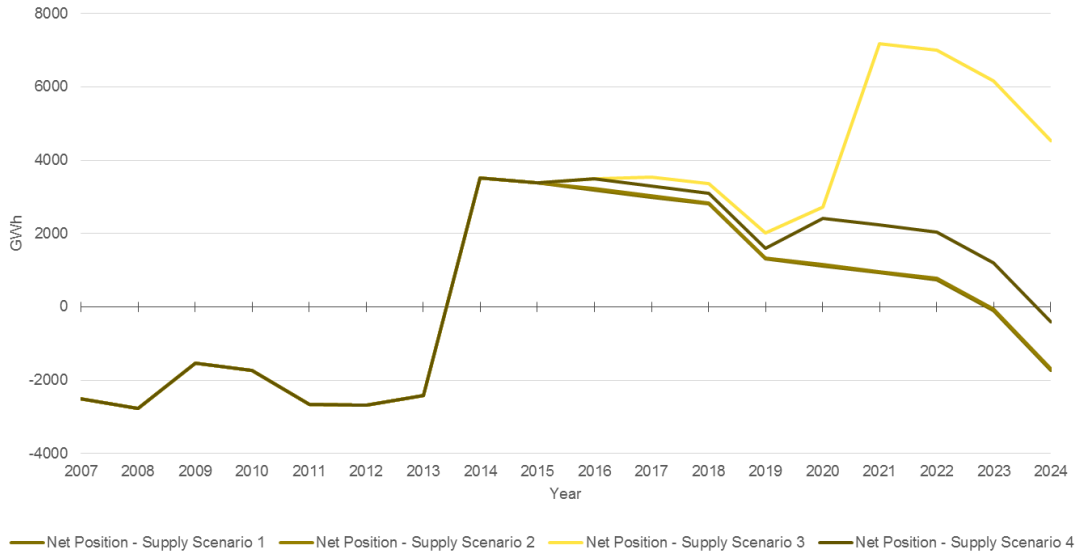

Figure 4 – Macedonia – Supply/Demand – Low Growth

In the case of the medium electricity consumption growth scenario it is evident that current efforts to meet Macedonia's electricity demand are insufficient to keep it self-sufficient. As of 2022 (in the case of supply scenario 1 and scenario 2) the country would turn (again) into a net importer of electricity. Therefore, at least some of the planned future capacity extensions (or equivalent projects) in scenario 3 would need to be realized to secure self-sufficiency during the period of examination. In supply scenario 4, Macedonia would not be able to satisfy its electricity demand.

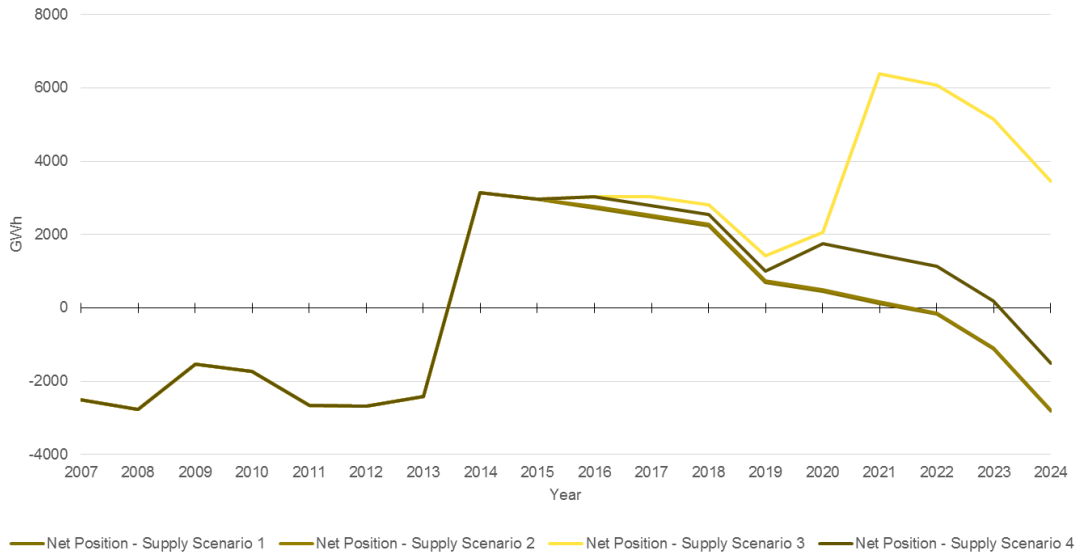

Figure 5 – Macedonia – Supply/Demand – Medium Growth

The high electricity consumption growth scenario shows similar findings to those described in the medium growth scenario above. As of 2019/2020 (in the case of supply scenario 1 and 2) the country would turn into a net importer of electricity, underlining that more generation capacity is required to maintain self-sufficiency. In case of the

projections of the Draft energy Strategy of Macedonia until 2034 (supply scenario 4) Macedonia would turn into an energy importer as of 2022.

Figure 6 – Macedonia – Supply/Demand – High Growth

2.4.1.2 Peak supply / peak demand balance

This balance examines the actual feed-in of electricity and the demand situation in Macedonia when the electricity feed-in reserves are at their presumed minimum and the electricity demand is at its presumed maximum. Subject to the caveat relating to the robustness of the underlying data, this enables the identification of critical electricity supply situations. This method should thus be interpreted with caution and viewed as an indication only.

Based on the available information the figure below clearly shows that peak demand for all demand scenarios severely outpaces the available peak supply in supply scenarios 1 and 2. In fact, supply scenario 2 is identical to scenario 1 because the Wind Park Bogdanci and Photovoltaic with PT are not base load capable and a TPP biogas with PT is not expected to commence operations in time. In supply scenario 3, however, peak electricity demand can be satisfied for the low and sometimes for the medium electricity demand scenario. In supply scenario 4 in particular a number of lignite power plants (TPP Mariovo, TPP Bitola 4, TPP Negotino 2) are presumed not to operate, explaining the weaker ability to satisfy peak demand.

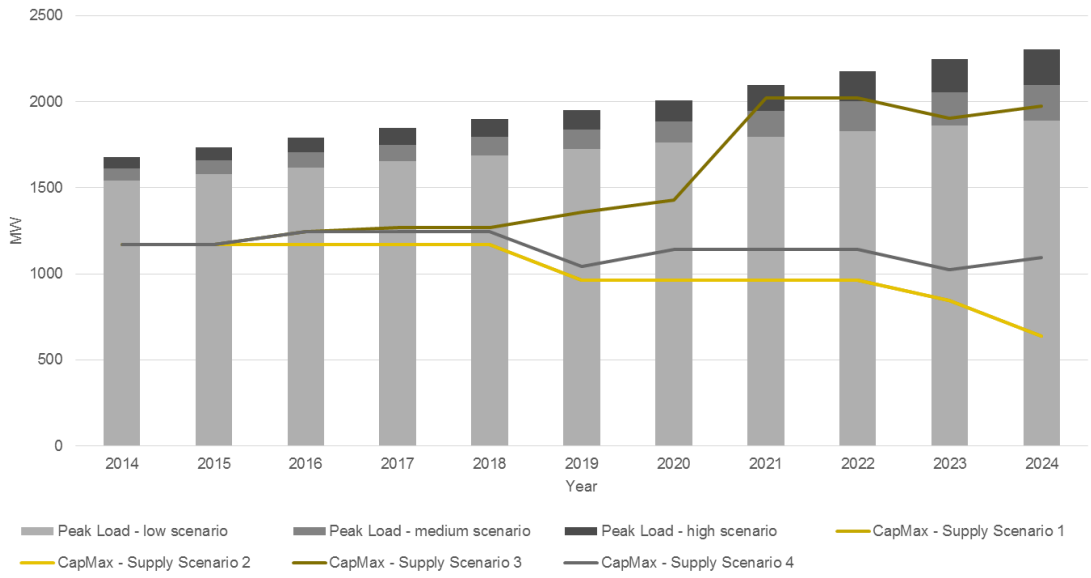

Figure 7 - Macedonia – Peak Supply/Demand Balance

2.4.2 Export analysis

This section of the report examines where energy produced in Macedonia could be exported. Potential trading partners can be found in the Western Balkans (i.e. in the other case study countries) (group 1), in the countries surrounding the Western Balkans (i.e. in the region) (group 2), or supra-regionally in the EU (group 3) or in the EU, Ukraine and Turkey (group 4). The export potential of Macedonia is thus compared to the net position in these scenarios.

Reflecting the range of outcomes in the supply and demand scenarios, the import/export capabilities of Macedonia and its trading partners are presented in the form of a range in the net exports, showing a minimum and a maximum value. Reflecting the underlying assumptions of the scenarios the range of possible outcomes widens over time.

In the figure below the import/export potential of Macedonia is shown in gold. Positive values denote Macedonia's export potential, while negative values denote its import needs. Positive values for the trading partners denote their demand for exports (short position) and negative numbers denote their export supply (long position). In the figure below export possibilities exist if there is a positive net position of Macedonia and positive export demand of the trading partners.

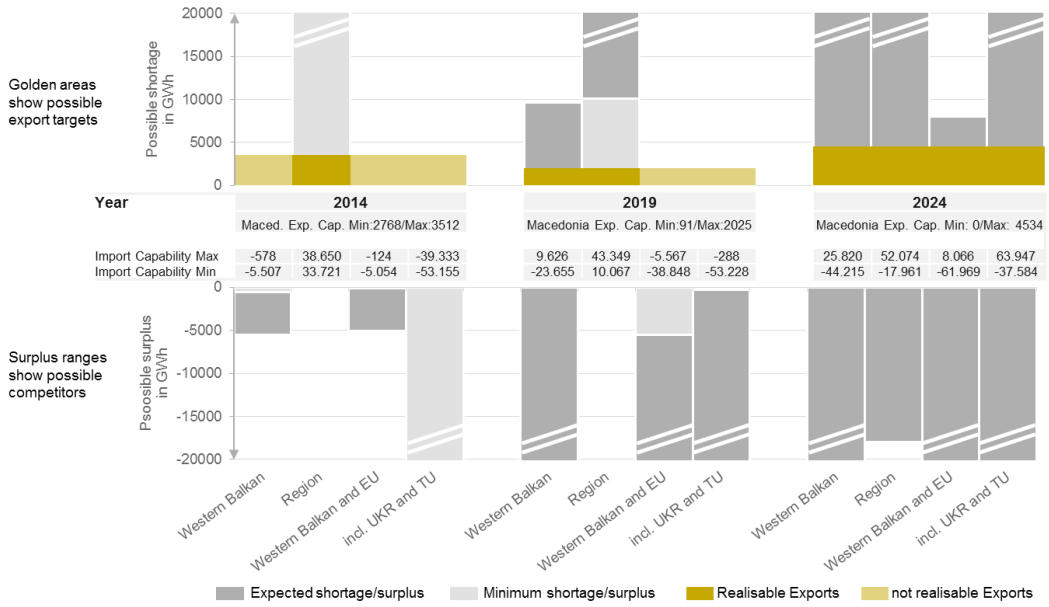

Figure 8 – Macedonia - Export Analysis

In 2014 Macedonia is in a long or short position. In case of a low consumption growth scenario Macedonia would be able to export up to 42% of its domestic demand (ca. 3500 GWh). The case study countries (group 1) were in a net long position entailing that they could export electricity. Examining the Western Balkans and its immediate neighbours jointly (group 2), it is noteworthy that they are in a net short position requiring about 28000 to 35000 GWh of electricity. Widening the framework of reference to the Western Balkans and the EU (group 3) shows that the region is in a slight long position. Including also Ukraine and Turkey (group 4) shows that there is a significant amount of excess supply in 2014.

In 2019 Macedonia is in a net long or slightly short position. If Macedonia is long, it could export up to 22% of its domestic demand (in case of the low consumption growth scenario). The case study countries (group 1) would be in a slight long or in a short position entailing that there might be a small export market for Macedonia electricity. However, given the range of the net position, it appears more likely that the case study countries will be striving to export electricity. Again the Western Balkans and its immediate neighbours considered jointly (group 2) are in a significant net short position and thus be importing electricity. Widening the framework of reference to the Western Balkans and the EU (group 3) shows, however, that there is no excess demand expected in 2019. Including also Ukraine and Turkey (group 4) into the analysis shows that there is a significant excess supply in 2019.

In 2024 Macedonia can be in a significantly long or in a significantly short position. In terms of domestic demand (low demand growth scenario) it might be able to export up to 45% of its total domestic electricity demand. The case study countries (group 1) will either be in a long or in a short position entailing that there might potentially be an export market for Macedonia's electricity. However, given the range of the net position, it appears more likely that the case study countries will be striving to export electricity. Again the Western Balkans and its immediate neighbours considered jointly (group 2) are in a significant net short position or in a net long position. It is thus unclear if they would be importers or exporters of electricity. Widening the framework of reference to

the Western Balkans and the EU (group 3) shows, however, that it is unlikely that there will be a lot of excess demand in 2024. Including also Ukraine and Turkey (group 4) into the analysis, the figure shows the possibility of a significant excess demand (but also a long position) in 2024. The maximum value for export demand is strongly driven by the Turkish electricity demand figures that are based on an exponential forecasting function. If Turkey is considered as a potential market, the transport capacities (costs) need to be observed.

For the purpose of evaluating export potentials and stranded assets a number of relationships need to be described. Transporting electricity is costly: in particular transfer fees (within countries) and transmission fees (between countries) must be paid. Also electricity transportation requires infrastructure. While this report does not extend to these dimensions, we assume that the local electricity market in the Western Balkans and the surrounding states are the most important indicator if there is demand for Macedonia electricity. That the EU is in a long position indicates that there will at least be competition which can be expected to put pressure on the electricity price.

The above has shown that Macedonia may be either in a long or a short position. If it turns into an exporting country the potential export capacity (measured in terms of domestic demand) is tremendous – both in case of a low demand growth scenario, but also in case of a high domestic demand scenario. Macedonia's maximum export capacity ranges between 2000 GWh and 4500 GWh and may therefore be felt in the region. Given that this constitutes a very significant amount in terms of domestic electricity demand, Macedonia may grow quickly dependent on its export markets. Given that future electricity markets are potentially long or might be supplied by other competitors, future electricity prices may be lower and hence give rise to stranded assets.

2.4.3 Energy Mix

The figures below present the changes in Macedonia's energy mix. The data from 2007 – 2013 present the energy mix based on actual production figures. By contrast, the data from 2014 – 2024 show the energy mix based on the maximum likely electricity generation capacity. This difference may explain the temporary decline in hydropower's share in the years 2010 until 2013.

Based on installed capacity, the energy mix in Macedonia (2014 – 2024) is generally quite stable. Coal/lignite (43%) and gas (34%) represent the largest share of installed capacity. This is followed by hydropower and oil with around 11% each, and wind power (ca. 1%). The energy mix changes in the years 2023 and 2024 due to generation capacity phase-outs. In 2024 Coal/lignite accounts for 35%, gas for 48%, hydropower for 16% and wind for a little over 1%. Oil is no longer part of the energy mix.

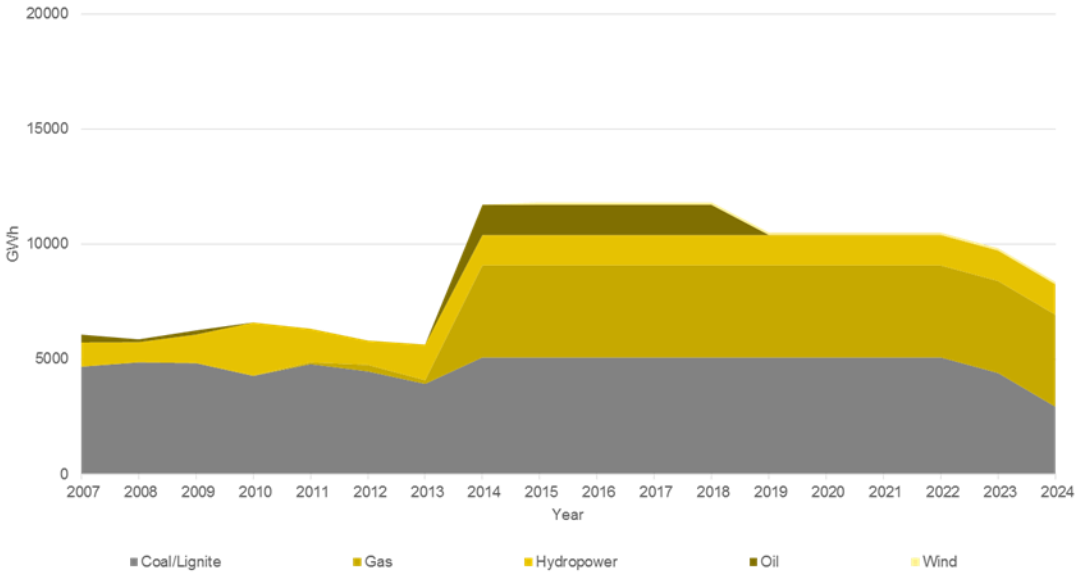

Figure 9 – Macedonia– Energy Mix Supply Scenario 1

If the current construction projects are being realized, the share of hydropower increases from 11% in 2014 to 16% in 2024. Over the same period the share of coal/lignite falls from 43% to 35%. This is attributable to the decommissioning of TPP Oslomej (677 GWh) in 2023. The share of oil (TPP Negotino) accounts for about 11% of the electricity production during the years 2014 to 2018.

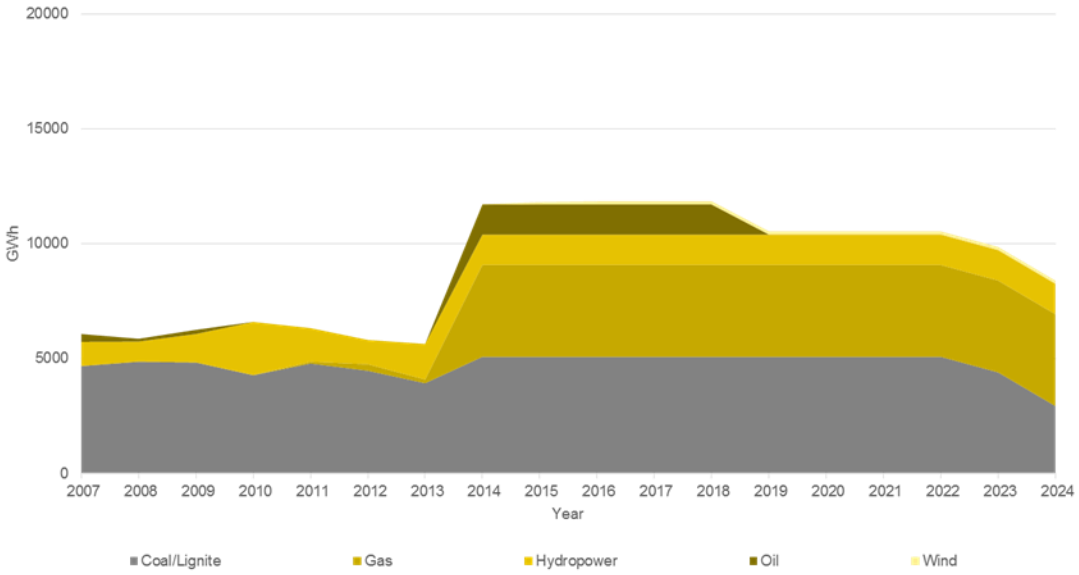

Figure 10 – Macedonia– Energy Mix Supply Scenario 2

In the planned future capacity scenario (supply scenario 3), the energy mix of Macedonia changes significantly. The marked increase of coal/lignite power plants from 43% in 2020 to 56% in 2021 is apparent and attributable to the power plants Mariovo (2137 GWh) and Bitola 4 (2210 GWh). The share of hydropower generation doubles over time. In 2024 coal/lignite account for 50%, gas for 27%, hydropower for 22% and wind for 1% of the total electricity generation capacity in Macedonia. This suggests that

the planned future capacity extension is to a very large extent biased towards coal and lignite power sources.

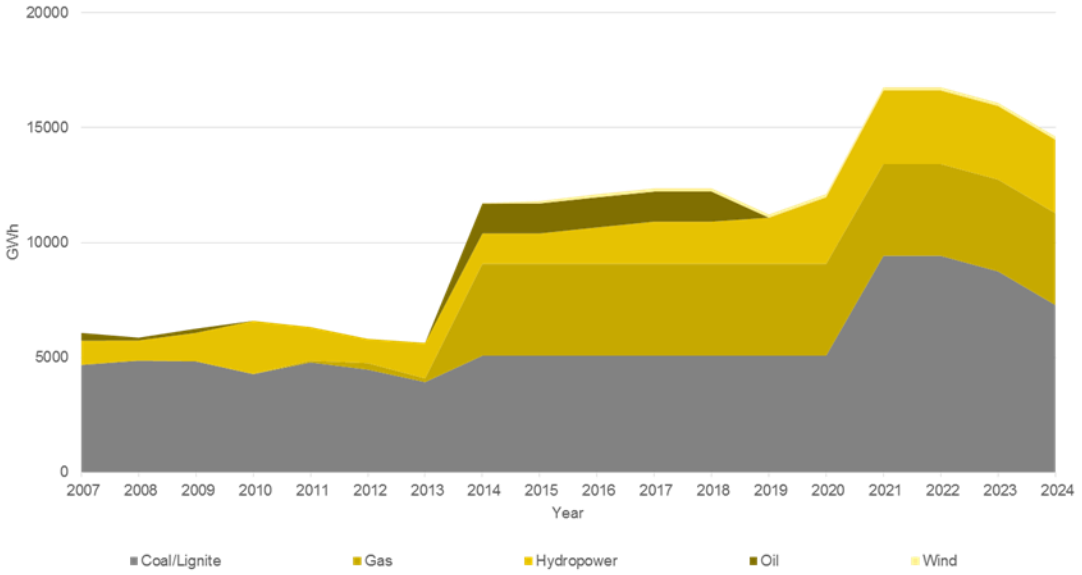

Figure 11 – Macedonia– Energy Mix Supply Scenario 3

In supply scenario 4 the share of coal/lignite declines from 43% in 2014 to 30% in 2024. The share of hydropower increases during the same period from 11 to 27%. Gas becomes the most important energy source of Macedonia. Whereas in 2014 the share was 24%, in 2024 it rises to 41%. This marked increase is not related to generation capacity extensions but can be explained by the decline in other electricity generation.

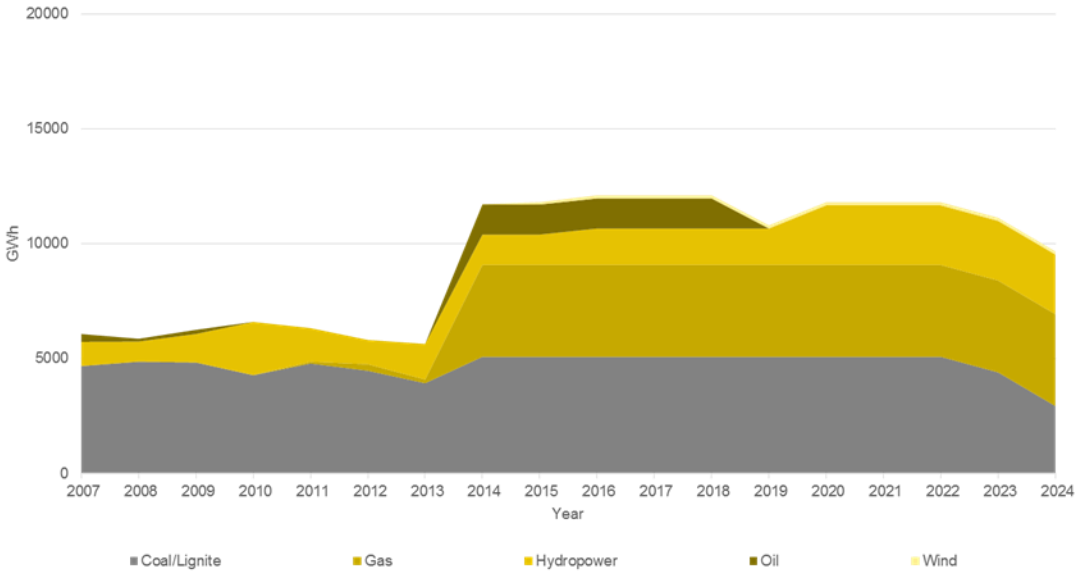

Figure 12 – Macedonia– Energy Mix Supply Scenario 4

2.5 Concluding remarks

This country report analyses the long-term electricity supply and demand pattern of Macedonia and examines its electricity export prospects from a stranded assets perspective.

The above analysis shows that Macedonia was historically (2007-2013) importing more than 20% of its demanded electricity. In terms of installed energy capacity, however, Macedonia should be able to export large amounts of electricity already in 2014 (of around 30% in a high demand growth scenario and 42% in case of a low demand growth scenario)[24]. Despite this, during the course of the next decade Macedonia will be turning from having a strong energy export potential to an importer unless additional investments in electricity generation are being realized. If Macedonia realized all of its currently planned capacity extension projects (scenario 3) or equivalent generation expansions, it would extend its export capacity more than 20% above its domestic demand (around 2000 GWh) in a high consumption demand scenario in 2024). If consumption demand was low, up to 45% of domestic electricity demand (around 4000 GWh) could be exported.

This situation would give rise to a substantial dependency on the export market. The export analysis has shown that the case study countries are likely to compete for exporting electricity to the neighbouring countries. Competition may in particular come from EU Member States, namely Bulgaria and Romania, and possibly in the near future Ukraine and Turkey. A high dependency on the export market therefore exposes the country to create the risk of stranded assets. From this point of view, a make-or-buy decision should also be investigated prior to new investments.

Concerning the peak load demand and supply analysis it bears mentioning that Macedonia is expected to remain vulnerable in supply scenarios 1 and 2. Also under supply scenario 3 it would be unable to satisfy its domestic demand for most demand scenarios.

In the case of Macedonia a few demand side issues merit particular mentioning. A demand side issue that is not examined in the case study but should be mentioned are the transmission and distribution losses. In Macedonia the overall loss in transmission and distribution amount to around 18%[25]. An increased performance of the network will have a noticeable impact on the security of supply as well as on the net position without further additional generation capacities. Moreover, energy efficiency measures may lead to electricity savings and help to improve the country's net position.

This report shows that the country does require good regional ties in the area of energy policy. The current infrastructure should therefore be examined from this perspective.

24 A significant difference between the actual historical data (2007 – 2013) and the installed production capacity in Macedonia (as of 2014) can be observed in the data. Possible domestic energy supply more than doubles from 2013 to 2014. This strong increase is explained by the difference between actual production presented by the historic data and the maximum capacity considered as of 2014. Specifically, this marked increase is largely attributable to the gas power plants ENERGETIKA Skopje (2197 GWh per year) and the Combined Cycle Cogeneration Power Plant TE-TO – Skopje (2011) (1800 GWH). But also the capacity increase of the Bogdanci wind park (100 GWh as of 2015) contributes to this increase

25 159 GWh in transmission and 990 GWh in distribution in 2013, see Energy Community Secretariat, Annual Implementation Report, August 2014, p. 91, available at: https://www.energy-community.org/pls/portal/docs/3356393.PDF

Importantly this report shows that the country has strong electricity export ambitions that creates the danger of stranded assets if the domestic electricity expansion decisions are taken without taking due account of developments in other countries in the Western Balkans and beyond. Decisions to buy or produce electricity should thus be taken in a strategic fashion that also takes due account of energy security considerations. It can thus be concluded that integration and collaboration in the area of energy policy in the Western Balkans is vital for Macedonia.

Sources

[MK-01] Ministry of Economy in Macedonia (2015), Draft energy strategy of Macedonia until 2035

[MK-02] Ministry of Economy in Macedonia (2010), 'Strategy for Energy Development in the Republic of Macedonia until 2030, available at http://www.encharter.org/fileadmin/user_upload/Energy_policies_and_legislation/The_FYROM_2010_Energy_Strategy_to_2030_ENG.pdf

[MK-03] Data provided by ENTSO-E, https://www.entsoe.eu

[MK-04] Statement on security of supply - Republic of Macedonia -Skopje, September 2013

[MK-05] ELEM, http://www.elem.com.mk/

Annex I – Generation Capacities (1/3)

Country	Type	Level	Plant	Installed Capacity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Albania	Hydropower		1 Komani 600 MW	600	2060	2060	2060	2060	2060	2060	2060	2060	2060	2060	2060
Albania	Hydropower		1 Fierza 500 MW	500	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Albania	Hydropower		1 Vau I Dejes 250 MW	250	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Albania	Hydropower		1 Ashta 1 + 2 – 53 MW	53	240	240	240	240	240	240	240	240	240	240	240
Albania	Hydropower		1 Ulez 25 MW – sales to KESH	25	81,2	81,2	81,2	81,2	81,2	81,2	81,2	81,2	81,2	81,2	81,2
Albania	Hydropower		1 Shkopet 24 MW – sales to KESH	24	63,3	63,3	63,3	63,3	63,3	63,3	63,3	63,3	63,3	63,3	63,3
Albania	Hydropower		1 Bistrica 1 – 24 MW – sales to KESH	24	60,2	60,2	60,2	60,2	60,2	60,2	60,2	60,2	60,2	60,2	60,2
Albania	Hydropower		1 Bistrica 2 - 5 MW – sales to KESH	5	23	23	23	23	23	23	23	23	23	23	23
Albania	Hydropower		1 Lana Bregas 5 MW – sales to KESH	5	33,9	33,9	33,9	33,9	33,9	33,9	33,9	33,9	33,9	33,9	33,9
Albania	Hydropower		1 Small hydropower plants under concession (see al	291,67	930	930	930	930	930	930	930	930	930	930	930
Albania	Gas		2 Vlora gas/oil 97 MW	97	0	0	679	679	679	679	679	679	679	679	679
Albania	Hydropower		3 Kalivaci 93 MW (Vjosa 1)	93	0	0	0	0	0	0	350	350	350	350	350
Albania	Hydropower		2 Devoll – Moglice – 172 MW	172	0	0	0	0	0	475	475	475	475	475	475
Albania	Hydropower		2 Devolli 1 (Banja) 70 MW	70	0	0	0	254	254	254	254	254	254	254	254
Albania	Hydropower		2 Fani i Madh and Fani i Vogel (Gojan, FHP2 – Gjegja	110,56	0	0	0	367,6	367,6	367,6	367,6	367,6	367,6	367,6	367,6
Albania	Hydropower		2 Small hydropower plants under construction 283.2	283,23	0	648	1296	1296	1296	1296	1296	1296	1296	1296	1296
Albania	Hydropower		3 Small hydropower plants expected in draft energy	160,77	0	0	0								
Albania	Wind		4 Shengjin-Kodrat e Rencit in Lezha (108+114 MW)	222	0	0	0	56,25	112,5	168,75	225	281,25	337,5	393,75	450
Albania	Wind		4 Bilisht-Kapshtice Wind Farm (150 MW)	150	0	0	0	41,25	82,5	123,75	165	206,25	247,5	288,75	330
Albania	Wind		4 Karaburun, Vlora (500 MW)	500	0	0	0	171,125	342,25	513,375	684,5	855,625	1026,75	1197,875	1369
Albania	Wind		4 Butrinti-Markat (72 MW)	72	0	0	0	8,125	16,25	24,375	32,5	40,625	48,75	56,875	65
Albania	Wind		4 Gryke derdhja Shkumbinit – Terpan (145 + 80 MW)	225	0	0	0	60,5	121	181,5	242	302,5	363	423,5	484
Albania	Wind		4 Kryevidh-Kavaja (40 + 150 MW)	190	0	0	0	46	92	138	184	230	276	322	368
Albania	Wind		4 Dajc-Velipoje (75 MW) in 2015	75	0	0	0	0	0	0	0	0	0	0	0
Albania	Wind		4 Barbullush (45 MW)	45	0	0	0	0	0	0	0	0	0	0	0
Albania	Wind		4 Bushat (26 MW)	26	0	0	0	0	0	0	0	0	0	0	0
Albania	Wind		4 Ulcinj (40 MW)	40	0	0	0	0	0	0	0	0	0	0	0
Albania	Hydropower		3 Vjosa1 93 MW	93	0	0	0	0	0	0	0	0	0	0	0
Albania	Hydropower		3 Drini1 48 MW	0	0	0	0	0	0	0	0	0	0	0	0
Albania	Coal/Lignite		3 "New" 300 MW	300	0	0	0	0	0	0	0	0	0	0	0
Albania	Solar		3 Solar Overall	0	0	0	0	0	0	0	0	0	0	0	0
Albania	Wind		3 Overall Wind	0	0	0	0	0	289,0055	315,173	367,508	367,508	367,508	367,508	367,508
Albania	Wind		4 Overall Wind Correction for Level 4	-1545	0	0	0	0	-289,0055	-315,173	-367,508	-367,508	-367,508	-367,508	-367,508
Bosnia and Herzegovina	Hydropower		1 Rama	160	650	650	650	650	650	650	650	650	650	650	650
Bosnia and Herzegovina	Hydropower		1 Capljina	440	200	200	200	200	200	200	200	200	200	200	200
Bosnia and Herzegovina	Hydropower		1 Mostar	72	247	247	247	247	247	247	247	247	247	247	247
Bosnia and Herzegovina	Hydropower		1 Jajce 1	60	232,90	232,90	232,90	232,90	232,90	232,90	232,90	232,90	232,90	232,90	232,90
Bosnia and Herzegovina	Hydropower		1 Jajce 2	30	157	157	157	157	157	157	157	157	157	157	157
Bosnia and Herzegovina	Hydropower		1 Pec-Mlini	30,6	82	82	82	82	82	82	82	82	82	82	82
Bosnia and Herzegovina	Hydropower		1 Jablanica	180	712,00	712,00	712,00	712,00	712,00	712,00	712,00	712,00	712,00	712,00	712,00
Bosnia and Herzegovina	Hydropower		1 Grabovica	114	285,00	285,00	285,00	285,00	285,00	285,00	285,00	285,00	285,00	285,00	285,00
Bosnia and Herzegovina	Hydropower		1 Salakovac	210	405,00	405,00	405,00	405,00	405,00	405,00	405,00	405,00	405,00	405,00	405,00
Bosnia and Herzegovina	Hydropower		1 Trebinje 1	171	393,8	393,8	393,8	393,8	393,8	393,8	393,8	393,8	393,8	393,8	393,8
Bosnia and Herzegovina	Hydropower		1 Dubrovnik	108	647,5	647,5	647,5	647,5	647,5	647,50	647,50	647,50	647,5	647,5	647,5
Bosnia and Herzegovina	Hydropower		1 Visegrad	315	909,2	909,2	909,2	909,2	909,2	909,20	909,20	909,20	909,20	909,20	909,20
Bosnia and Herzegovina	Hydropower		1 Bocac	110	273,9	273,9	273,9	273,9	273,9	273,9	273,9	273,9	273,9	273,9	273,9
Bosnia and Herzegovina	Hydropower		1 Mostarsko Blato	60	167	167	167	167	167	167	167	167	167	167	167
Bosnia and Herzegovina	Coal/Lignite		1 Tuzla G3	100	463	463	463	463	463	0	0	0	0	0	0
Bosnia and Herzegovina	Coal/Lignite		1 Tuzla G4	200	1241	1241	1241	1241	1241	1241	1241	0	0	0	0
Bosnia and Herzegovina	Coal/Lignite		1 Tuzla G5	200	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125
Bosnia and Herzegovina	Coal/Lignite		1 Tuzla G6	215	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Bosnia and Herzegovina	Coal/Lignite		1 Kakanj G5	118	645	645	645	645	645	645	645	645	645	645	0
Bosnia and Herzegovina	Coal/Lignite		1 Kakanj G6	110	632	632	632	632	632	632	632	632	632	632	632
Bosnia and Herzegovina	Coal/Lignite		1 Kakanj G7	230	1487	1487	1487	1487	1487	1487	1487	1487	1487	1487	1487
Bosnia and Herzegovina	Coal/Lignite		1 Gacko	300	1619,7	1619,7	1619,7	1619,7	1619,7	1619,7	1619,7	1619,7	1619,7	1619,7	1619,7
Bosnia and Herzegovina	Coal/Lignite		1 Ugljevik	300	1530	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Bosnia and Herzegovina	Hydropower		2 Dub and Ustipraca	17,1	0	0	0	74,4	74,4	74,4	74,4	74,4	74,4	74,4	74,4
Bosnia and Herzegovina	Hydropower		2 Ulog	34,4	0	0	0	0	82,3	82,3	82,3	82,3	82,3	82,3	82,3
Bosnia and Herzegovina	Hydropower		3 Sutjeska mini-hydropower plants	19,15	0	0	0	83,6	83,6	83,6	83,6	83,6	83,6	83,6	83,6
Bosnia and Herzegovina	Hydropower		3 Dabar	159,9	0	0	0	0	0	251,8	251,8	251,8	251,8	251,8	251,8
Bosnia and Herzegovina	Hydropower		3 Ustikolina	65,4	0	0	0	0	0	0	0	236,8	236,8	236,8	236,8
Bosnia and Herzegovina	Hydropower		3 Vranduk	19,6	0	0	0	0	96,4	96,4	96,4	96,4	96,4	96,4	96,4
Bosnia and Herzegovina	Hydropower		3 Janjici	13	0	0	0	0	0	0	68	68	68	68	68
Bosnia and Herzegovina	Hydropower		3 Krusevo and Zeleni Vir	13	0	0	0	0	0	0	0	0	40	40	40
Bosnia and Herzegovina	Hydropower		3 Small hydropower plants Republika Srpska – medi	40	0	26,3	31,56	36,82	42,08	47,34	52,6	63,12	73,64	84,16	94,68
Bosnia and Herzegovina	Hydropower		3 Upper Drina (Foca, Paunci, Buk Bijela, Sutjeska)	558	0	0	0	0	0	0	0	783	783	783	783
Bosnia and Herzegovina	Hydropower		3 Mrsovo	43,8	0	0	0	0	0	0	165,1	165,1	165,1	165,1	165,1
Bosnia and Herzegovina	Coal/Lignite		2 Stanari	300	0	0	1500	2000	2000	2000	2000	2000	2000	2000	2000
Bosnia and Herzegovina	Coal/Lignite		3 Tuzla 7	450	0	0	0	0	0	1823	2604	2604	2604	2604	2604
Bosnia and Herzegovina	Coal/Lignite		3 Kakanj 8	300	0	0	0	0	0	0	0	0	0	1456	1820
Bosnia and Herzegovina	Coal/Lignite		3 Ugljevik III	600	0	0	0	0	0	0	4380	4380	4380	4380	4380
Bosnia and Herzegovina	Coal/Lignite		3 Banovici	300	0	0	0	0	0	2047	2047	2047	2047	2047	2047
Bosnia and Herzegovina	Gas		3 KTG Zenica	373,1	0	0	0	0	2593,2	2593,2	2593,2	2593,2	2593,2	2593,2	2593,2
Bosnia and Herzegovina	Wind		2 Trusina	51	0	0	160	160	160	160	160	160	160	160	160
Bosnia and Herzegovina	Wind		3 Mesihovina	55	0	0	0	0	146	146	146	146	146	146	146
Bosnia and Herzegovina	Wind		3 Podvelezje	48	0	0	62	103	103	103	103	103	103	103	103
Bosnia and Herzegovina	Wind		3 Vlasic	48	0	0	0	0	0	59	98	98	98	98	98
Bosnia and Herzegovina	Wind		3 Bitovnja	60	0	0	0	0	0	0	0	0	62	104	104
Bosnia and Herzegovina	Wind		3 Zukica Kosa	15	0	0	0	0	0	0	0	0	0	8	26
Bosnia and Herzegovina	Hydropower		1 Small hydropower existing EPBiH (Modrac, Bogatic	13	65	65	65	65	65	65	65	65	65	65	65
Bosnia and Herzegovina	Hydropower		3 New small hydro EPBiH – Neretvica, Una Anex, Cat	43	0	0	0	102	123	123	145	145	145	161	161
Bosnia and Herzegovina	Hydropower		3 Bileca/Nevesinje	91	0	0	0	0	0	0	0	0	0	0	0
Bosnia and Herzegovina	Hydropower		3 HE Kovanići	13	0	0	0	0	0	0	0	0	0	0	68
Bosnia and Herzegovina	Hydropower		3 Srednja Drina 321 MW	160,5	0	0	0	0	0	0	0	0	0	714,55	714,55
Bosnia and Herzegovina	Hydropower		3 Donja Drina (Kozluk, Drina I, II and III), total 365 M	182,5	0	0	0	0	0	794	794	794	794	794	794
Kosovo	Coal/Lignite		1 Kosova A (3x200 MW operational)	600	2140	2171	2171	2148	0	0	0	0	0	0	0
Kosovo	Coal/Lignite		1 Kosova B (2x 339 MW, around 540 MW operational	540	4062	4062	4075	3556	3556	4062	4024	4003	3983	3983	3983
Kosovo	Hydropower		1 Ujmani (35 MW)	35	82	82	82	82	78	78	78	78	78	78	78
Kosovo	Hydropower		1 Lumbardhi (8.8 MW)	8,8	26	27	26	27	27	27	27	27	27	27	27

Annex I – Generation Capacities (2/3)

Country	Type	Level	Plant	Installed Capacity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Kosovo	Hydropower		1 Dikance+Burimi+Radavci (2.76 MW total)	2,76	23	22	23	22	26	26	26	26	26	26	26
Kosovo	Hydropower		3 Zhuri 305 MW	305	0	0	0	0	0	398	398	398	398	398	398
Kosovo	Hydropower		3 Small HPPs (110 MW by 2020)	273,1	0	0	94,3	97,3	248,3	267,3	345,3	384,3	388,3	388,3	472
Kosovo	Coal/Lignite		3 New Kosova	600	0	0	0	0	0	2100	4200	4200	4200	4200	4200
Kosovo	Wind		3 Zatric, 45 MW	184,8	0	0	127,6	127,6	127,6	127,6	127,6	127,6	127,6	127,6	127,6
Kosovo	Wind		3 Budakova, 45 MW	45	0	0	111	111	111	111	111	111	111	111	111
Kosovo	Wind		3 Kitka 30 MW	30	0	0	74	74	74	74	74	74	74	74	74
Kosovo	Biomass		3 Biomass	20,3	0	0	0	0	11	17	19	23	28	28	28
Kosovo	Solar		3 Planned solar PV	12,7	0	0	0	2	2	2	3	3	3	3	3
Kosovo	Hydropower		2 Deçan, Belaja, Lumëbardhi II	22,9	0	0	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7
Macedonia	Hydropower		1 Tikves (put in operation 1966/1981)	114	184	184	184	184	184	184	184	184	184	184	184
Macedonia	Hydropower		1 Vrutok (1957/1958/1973)	150	350	350	350	350	350	350	350	350	350	350	350
Macedonia	Hydropower		1 Vreben (put in operatio 1959)	12,8	45	45	45	45	45	45	45	45	45	45	45
Macedonia	Hydropower		1 Raven (put in operation 1959/ 1973)	19,2	40	40	40	40	40	40	40	40	40	40	40
Macedonia	Hydropower		1 Globocica (put in operation 1965)	42	191	191	191	191	191	191	191	191	191	191	191
Macedonia	Hydropower		1 Spilje (put in operation 1969)	84	300	300	300	300	300	300	300	300	300	300	300
Macedonia	Hydropower		1 Kozjak (put in operation 2004)	80	150	150	150	150	150	150	150	150	150	150	150
Macedonia	Hydropower		1 Sveta Petka	36,4	66	66	66	66	66	66	66	66	66	66	66
Macedonia	Coal/Lignite		1 TPP Bitola 1 (1982)	225	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	0
Macedonia	Coal/Lignite		1 TPP Bitola 2 (1984)	225	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667
Macedonia	Coal/Lignite		1 TPP Bitola 3 (1988)	225	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667	1466,666667
Macedonia	Coal/Lignite		1 TPP Oslomej (1980)	125	677	677	677	677	677	677	677	677	677	0	0
Macedonia	Oil		1 TPP Negotino (put in operation 1978)	210	1308	1308	1308	1308	1308	0	0	0	0	0	0
Macedonia	Gas		1 Combined Cycle Cogeneration Power Plant TE-TO	230	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Macedonia	Gas		1 ENERGETIKA Skopje	30	2.197	2.197	2.197	2.197	2.197	2.197	2.197	2.197	2.197	2.197	2.197
Macedonia	Hydropower		3 HPP Cebren Installed capacity (turbine/pump) 333	333	0	0	0	0	0	54	54	54	54	54	54
Macedonia	Hydropower		3 HPP Galiste (installed capacity 193,50 MW)	193,5	0	0	263	263	263	263	263	263	263	263	263
Macedonia	Hydropower		3 HPP Boskov Most (installed capacity 68 MW)	68	0	0	0	0	0	118	118	118	118	118	118
Macedonia	Hydropower		3 HPP Veles (installed capacity 80 MW)	80	0	0	0	0	0	0	0	301	301	301	301
Macedonia	Hydropower		3 HPP Gradec (installed capacity 54.6 MW)	54,6	0	0	0	252	252	252	252	252	252	252	252
Macedonia	Hydropower		3 Babuna (installed 17.34 MW)	17,34	0	0	0	0	0	0	57	57	57	57	57
Macedonia	Hydropower		3 Zgropolci (installed 16.93 MW)	16,93	0	0	0	0	0	0	56	56	56	56	56
Macedonia	Hydropower		3 Gradsko (installed 16.93 MW)	16,93	0	0	0	0	0	0	66,6	66,6	66,6	66,6	66,6
Macedonia	Hydropower		3 Kukurecani (installed 16.93 MW)	16,93	0	0	0	0	0	0	79,5	79,5	79,5	79,5	79,5
Macedonia	Hydropower		3 Krivolak (installed 16.93 MW)	16,93	0	0	0	0	0	0	80	80	80	80	80
Macedonia	Hydropower		3 Dubrovo (installed 16.93 MW)	16,93	0	0	0	0	0	0	80,2	80,2	80,2	80,2	80,2
Macedonia	Hydropower		3 Demir Kapija (installed 24.48 MW)	24,48	0	0	0	0	0	0	116,4	116,4	116,4	116,4	116,4
Macedonia	Hydropower		3 Miletkovo (installed 16.72 MW)	16,72	0	0	0	0	0	0	80,3	80,3	80,3	80,3	80,3
Macedonia	Hydropower		3 Gavato (installed 16.72 MW)	16,72	0	0	0	0	0	0	83,2	83,2	83,2	83,2	83,2
Macedonia	Hydropower		3 Gevgelija (installed 16.93 MW)	16,93	0	0	0	0	0	0	85,1	85,1	85,1	85,1	85,1
Macedonia	Coal/Lignite		3 TPP Mariovo (installed 300 MW)	300	0	0	0	0	0	0	0	2137	2137	2137	2137
Macedonia	Coal/Lignite		3 TPP Bitola 4 (300 MW)	300	0	0	0	0	0	0	0	2210	2210	2210	2210
Macedonia	Coal/Lignite		3 TPP Negotino 2 (installed 300 MW)	300	0	0	0	0	0	0	0	0	0	0	
Macedonia	Wind		1 Wind Park Bogdanci phase 1 (installed 36.8 MW)	36,8	15	100	100	100	100	100	100	100	100	100	100
Macedonia	Wind		2 Wind Park Bogdanci phase 2 (installed 13.8 MW)	13,8	0	0	37	37	37	37	37	37	37	37	37
Macedonia	Hydropower		3 Crn Kamen (installed 5 MW) and other small hydr	5	0	0	0	0	0	0	106	106	106	106	106
Macedonia	Wind		3 Wind power plant with PT	50	0	0	0	0	0	0	0	0	0	0	0
Macedonia	Biomass		3 CHP biomass power plant with PT	5	0	0	0	0	0	0	0	0	0	0	0
Macedonia	Biomass		3 CHP biomass power plant with PT	6,2	0	0	0	0	0	0	0	0	0	0	0
Macedonia	Biomass		2 TPP biogas with PT	7	0	0	0	0	0	0	0	0	0	0	0
Macedonia	Geothermal		3 Geothermal with PT	6	0	0	0	0	0	0	0	0	0	0	0
Macedonia	Photovoltaic		2 Photovoltaic with PT	25	0	0	0	0	0	0	0	0	0	0	0
Macedonia	Hydropower		4 Scenario 4 Correction HPP Cebren Installed capaci	-333				0	0	-54	-54	-54	-54	-54	-54
Macedonia	Hydropower		4 Scenario 4 Correction HPP Veles (installed capacit	-80				0	0	0	0	-300,6	-300,6	-300,6	-300,6
Macedonia	Hydropower		4 Scenario 4 Correction HPP Gradec (installed capaci	-54,6				-252,4	-252,4	-252,4	-252,4	-252,4	-252,4	-252,4	-252,4
Macedonia	Coal/Lignite		4 Scenario 4 Correction TPP Mariovo (installed 300 M	-300				0	0	0	0	-2137	-2137	-2137	-2137
Macedonia	Coal/Lignite		4 Scenario 4 Correction TPP Bitola 4 (300 MW)	-300				0	0	0	0	-2210	-2210	-2210	-2210
Macedonia	Coal/Lignite		4 Scenario 4 Correction TPP Negotino 2 (installed 30	-300				0	0	0	0	0	0	0	0
Macedonia	Hydropower		4 Scenario 4 HPP Boskov Most (installed capacity 68	-68	0	0	0	0	0	-118	0	0	0	0	0
Montenegro	Hydropower		1 Perucica	307	932	932	932	932	978	978	978	978	978	978	978
Montenegro	Hydropower		1 Piva	342	749	762	762	762	762	762	800	800	800	800	800
Montenegro	Hydropower		1 sHPP Slap Zete	1,2	3,5	3,5	3,5	14,6	14,6	14,6	14,6	14,6	14,6	14,6	14,6
Montenegro	Hydropower		1 sHPP Glava Zete	6,56	12	12	12	15	15	15	15	15	15	15	15
Montenegro	Hydropower		1 Other small hydros	3,2	21	21	21	21	21	21	21	21	21	21	21
Montenegro	Coal/Lignite		1 Pljevlja I	210	1407	1179	1179	1179	1179	1179	600	600	600	600	600
Montenegro	Hydropower		3 Moraca	238,4	0	0	0	0	0	0	0	616	616	616	616
Montenegro	Hydropower		3 Komarnica	168	0	0	0	0	0	0	0	0	227	227	227
Montenegro	Hydropower		2 Small hydros	39,3	0	80	126,55	126,55	126,55	126,55	126,55	126,55	126,55	126,55	126,5
Montenegro	Coal/Lignite		3 Pljevlja II	220	0	0	0	0	0	0	0	1360	1360	1360	1360
Montenegro	Wind		2 Mozura	46	0	0	0	105,8	105,8	105,8	105,8	105,8	105,8	105,8	105,8
Montenegro	Wind		3 Krnovo (Niksic)	50	0	0	0	115	115	115	115	115	115	115	115
Montenegro	Wind		3 Krnovo (Savnik)	22	0	0	0	50,6	50,6	50,6	50,6	50,6	50,6	50,6	50,6
Montenegro	Wind		3 Other new wind	39,3	0	0	0	0	17,2	17,2	76,4	76,4	76,4	76,4	76,4
Montenegro	Solar		3 Total new solar PV capacity	31,5	0	5	10	12	13	15	17	19	23	27	31
Montenegro	Incineration		3 Total new incineration capacity	10	0	0	0	0	0	0	70	70	70	70	70
Montenegro	Biomass		3 Total biomass electricity generation	39	0	1,1	6,1	12,1	18,1	24,1	31	43	51	59	66
Montenegro	Hydropower		3 Small hydros	33,655	0	12,0329	24,0658	36,0987	48,1316	60,1645	72,1974	84,2303	96,2632	108,2961	120,329
Serbia	Hydropower		1 Derdap 1, 1058 MW	1058	5489	5489	5489	5489	5489	5489	5489	5489	5489	5489	5489
Serbia	Hydropower		1 Derdap 2, 270 MW	270	1504	1504	1504	1504	1504	1504	1504	1504	1504	1504	1504
Serbia	Hydropower		1 Pirot, 80 MW	80	87	87	87	87	87	87	87	87	87	87	87
Serbia	Hydropower		1 Vlasina 129 MW total	129	285	285	285	285	285	285	285	285	285	285	285
Serbia	Hydropower		1 Drin-Lim hydropower plants (Uvac(36), Kokin Brod	680	3275	3275	3275	3275	3275	3275	3275	3275	3275	3275	3275
Serbia	Hydropower		1 Bajina Bašta pumped storage plant 614 MW	614	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001
Serbia	Coal/Lignite		1 Nikola Tesla A1, 210 MW	210	1231	1231	1231	1231	1231	1231	1231	0	0	0	0
Serbia	Coal/Lignite		1 Nikola Tesla A2, 210 MW	210	1198	1198	1198	1198	1198	1198	1198	1198	1198	0	0
Serbia	Coal/Lignite		1 Nikola Tesla A3, 305 MW	305	1923	1923	1923	1923	1923	1923	1923	1923	1923	1923	1923
Serbia	Coal/Lignite		1 Nikola Tesla A4, 309 MW	309	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989
Serbia	Coal/Lignite		1 Nikola Tesla A5, 309 MW	309	1999	1999	1999	1999	1999	1999	1999	1999	1999	1999	1999
Serbia	Coal/Lignite		1 Nikola Tesla A6, 309 MW	309	1987	1987	1987	1987	1987	1987	1987	1987	1987	1987	1987

Annex I – Generation Capacities (3/3)

Country	Type	Level	Plant	Installed Capacity	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serbia	Coal/Lignite	1	Nikola Tesla B1, 620 MW	620	4151	4151	4151	4151	4151	4151	4151	4151	4151	4151	4151
Serbia	Coal/Lignite	1	Nikola Tesla B2, 620 MW	620	4004	4004	4004	4004	4004	4004	4004	4004	4004	4004	4004
Serbia	Coal/Lignite	1	Kolubara 1, 32 MW	32	175	175	175	175	0	0	0	0	0	0	0
Serbia	Coal/Lignite	1	Kolubara 2, 32 MW	32	116	116	116	116	0	0	0	0	0	0	0
Serbia	Coal/Lignite	1	Kolubara 3, 64 MW	64	135	135	135	135	135	0	0	0	0	0	0
Serbia	Coal/Lignite	1	Kolubara 4, 32 MW	32	0	0	0	0	0	0	0	0	0	0	0
Serbia	Coal/Lignite	1	Kolubara 5, 110 MW	110	626	626	626	626	626	626	0	0	0	0	0
Serbia	Coal/Lignite	1	Morava, 125 MW	125	566	566	566	566	566	566	566	0	0	0	0
Serbia	Coal/Lignite	1	Kostolac A1, 100 MW	100	560	560	560	560	560	560	560	0	0	0	0
Serbia	Coal/Lignite	1	Kostolac A2, 210 MW	210	1196	1196	1196	1196	1196	1196	1196	1196	1196	1196	1196
Serbia	Coal/Lignite	1	Kostolac B1, 348 MW	348	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Serbia	Coal/Lignite	1	Kostolac B2, 348 MW	348	1895	1895	1895	1895	1895	1895	1895	1895	1895	1895	1895
Serbia	Gas	1	TE TO Novi Sad 1, 135 MW and 2, 110 MW	245	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Serbia	Gas	1	TE TO Zrenjanin, 110 MW	110	750	750	750	750	750	750	750	750	750	750	750
Serbia	Gas	1	TE TO Sremska Mitrovica, 32 MW	32	200	200	200	200	200	200	200	200	200	200	123
Serbia	Biomass	1	Existing biogas plants 4.8 MW	4,8	22	22	22	22	22	22	22	22	22	22	22
Serbia	Solar	1	Kladovo 2 MWp	2	1,5	3	3	3	3	3	3	3	3	3	3
Serbia	Solar	1	Beocin 1 MW	1	0	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5
Serbia	Solar	1	Matarova 2 MWp	2	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5
Serbia	Coal/Lignite	3	Kostolac B3 350 MW	350	0	0	0	0	0	0	0 ?	?	?	?	
Serbia	Coal/Lignite	3	Kolubara B 2x350 MW	350	0	0	0	0	0	0	0	2610	4966	4557	4986
Serbia	Coal/Lignite	3	TENT B3 750 MW	750	0	0	0	0	0	0	0	5000	5000	5000	5000
Serbia	Coal/Lignite	3	Kovin 2x350 MW	350	0	0	0	0	0	0	0	0 ?	?	?	
Serbia	Coal/Lignite	3	Stavalj 300 MW	300	0	0	0	0	0	0	0 ?	?	?	?	
Serbia	Gas	3	TE TO Novi Sad 450 MWe	450	0	0	0	0	0	0	3300	3300	3300	3300	3300
Serbia	Hydropower	3	Velika Morava, total 147.7 MW (HPP Ljubicevo, HP	14,77	0	0	0	0	0	0	0	645,5	645,5	645,5	645,5
Serbia	Hydropower	3	Ibar, total 117 MW	117	0	0	0	0	0	480	480	480	480	480	480
Serbia	Hydropower	3	Srednja Drina 321 MW	160,5	0	0	0	0	0	0	0	0	0	714,55	714,55
Serbia	Hydropower	3	Bistrica Pumped Storage Plant, 4x170 MW	680	0	0	0	0	0	0	0,00001	0,00001	0,00001	0,00001	0,00001
Serbia	Hydropower	3	Derdap 3 Pumped Storage Plant, 2x300 MW	600	0	0	0	0	0	0	0	0	0	0,0001	0,0001
Serbia	Hydropower	3	Donja Drina (Kozluk, Drina I, II and III), total 365 M	182,5	0	0	0	0	0	794	794	794	794	794	794
Serbia	Hydropower	3	Small hydropower plants, 188 MW total by 2020	188	182	171	216	268	269	377	558	558	558	558	558
Serbia	Wind	2	Plandište, 102 MW	102	0	0	0	0	212	212	212	212	212	212	212
Serbia	Wind	2	Čibuk 1/Dolovo, 158 MW	158	0	0	0	0	480	480	480	480	480	480	480
Serbia	Wind	2	Alibunar 1, 99 MW	99	0	0	0	0	308	308	308	308	308	308	308
Serbia	Wind	2	Kula, 9.9 MW and La Piccolina, Vrsac, 6.6 MW	6,6	0	0	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2
Serbia	Wind	2	Alibunar, 42 MW	42	0	0	0	0	132	132	132	132	132	132	132
Serbia	Biomass	3	Planned biomass CHP 100 MW	100	0	0	0	66	99	132	640	640	640	640	640
Serbia	Biomass	3	Planned biogas CHP 30 MW	30	0	0	0	0	0	135	305	305	305	305	305
Serbia	Incineration	3	Planned electricity from waste and landfill gas 13	13	0	0	0	17	34	51	68	68	68	68	68

Annex II – Supply/Demand Calculation Macedonia (GWh)

Demand Scenario	Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Source
Historical	Demand	8566	8643	7796	8328	8986	8488	8049												Data provided by ENTSO-E
	Supply	6070	5863	6252	6598	6327	5813	5638												Data provided by ENTSO-E
	Long/Short	-2496	-2780	-1544	-1730	-2659	-2675	-2411											-	
high consumption	Demand prospected								8955	9257	9548	9839	10118	10409	10711	11176	11595	11967	12270	Own calc : Diff between base and energy eff added to base scen in absolut values
	Supply Level 1								11723	11808	11808	11808	11808	10500	10500	10500	10500	9823	8356	see Generation Capacities
	Supply Level 2								11723	11808	11845	11845	11845	10537	10537	10537	10537	9860	8399	see Generation Capacities
	Supply Level 3								11723	11808	12108	12360	12360	11224	12114	16761	16761	16084	14618	
	Supply Level 4								11723	11808	12108	12108	12108	10800	11807	11807	11807	11130	9664	see Generation Capacities
	S1 Long/Short								2768	2551	2260	1969	1690	91	-211	-676	-1095	-2144	-3913	
	S2 Long/Short								2768	2551	2297	2006	1727	128	-174	-639	-1058	-2107	-3876	-
	S3 Long/Short								2768	2551	2559	2521	2242	815	1402	5585	5166	4117	2340	-
	S4 Long/Short								2768	2551	2559	2289	1989	391	1096	631	212	-837	-2606	-
medium consumption	Demand prospected								8583	8839	9083	9327	9560	9804	10048	10374	10676	10944	11176	STRATEGY FOR ENERGY DEVELOPMENT IN THE REPUBLIC OF MACEDONIA, (Ministry of Economy, 2010), page 102, scenario baseline
	Supply Level 1								11723	11808	11808	11808	11808	10500	10500	10500	10500	9823	8356	see Generation Capacities
	Supply Level 2								11723	11808	11845	11845	11845	10537	10537	10537	10537	9860	8399	see Generation Capacities
	Supply Level 3								11723	11808	12108	12360	12360	11224	12114	16761	16761	16084	14618	
	Supply Level 4								11723	11808	12108	12108	12108	10800	11807	11807	11807	11130	9664	see Generation Capacities
	S1 Long/Short								3140	2969	2725	2481	2248	696	452	126	-176	-1121	-2820	-
	S2 Long/Short								3140	2969	2762	2518	2285	733	489	163	-139	-1084	-2783	
	S3 Long/Short								3140	2969	3024	3033	2800	1420	2065	6387	6085	5140	3441	-
	S4 Long/Short								3140	2969	3024	2780	2548	995	1759	1493	1131	186	-1513	-
low consumption	Demand prospected								8211	8420	8618	8816	9002	9199	9385	9571	9758	9920	10083	STRATEGY FOR ENERGY DEVELOPMENT IN THE REPUBLIC OF MACEDONIA, (Ministry of Economy, 2010), page 102, scenario with strengthene
	Supply Level 1								11723	11808	11808	11808	11808	10500	10500	10500	10500	9823	8356	see Generation Capacities
	Supply Level 2								11723	11808	11845	11845	11845	10537	10537	10537	10537	9860	8393	
	Supply Level 3								11723	11808	12108	12360	12360	11224	12114	16761	16761	16084	14618	see Generation Capacities
	Supply Level 4								11723	11808	12108	12108	12108	10800	11807	11807	11807	11130	9664	see Generation Capacities
	S1 Long/Short								3512	3388	3190	2992	2806	1301	1115	929	742	-97	-1727	-
	S2 Long/Short								3512	3388	3227	3029	2843	1338	1152	966	779	-60	-1690	
	S3 Long/Short								3512	3388	3490	3544	3358	2025	2728	7190	7004	6164	4534	-
	S4 Long/Short								3512	3388	3490	3292	3106	1600	2422	2236	2050	1210	-420	-

Annex III - Peak Calculation Macedonia (MW)

Demand Scenario	Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Peak Load	Peak Load - low	1540	1580	1617	1654	1689	1726	1761	1796	1830	1861	1892
	Peak Load - medium	1610	1658	1704	1750	1793	1839	1885	1946	2003	2053	2097
	Peak Load - high	1680	157,1	1791	192	1898	226,9	2009	301,1	2175	384	2302
high consumption	Supply Level 1	1169	1169	1169	1169	1169	963,7	963,7	963,7	963,7	846,9	636,5
	Supply Level 2	1169	1169	1169	1169	1169	963,9	963,9	963,9	963,9	847	636,6
	Supply Level 3	1169	1169	1246	1268	1268	1357	1429	2022	2022	1906	1976
	Supply Level 4	1169	1169	1246	1246	1246	1041	1141	1141	1141	1024	1094
	S1 Long/Short	-511	-568	-622	-677	-729	-989	-1046	-1133	-1211	-1398	-1665
	S2 Long/Short	-511	-568	-622	-677	-729	-989	-1046	-1133	-1211	-1398	-1665
	S3 Long/Short	-511	-568	-545	-577	-630	-596	-580	-74	-153	-339	-326
	S4 Long/Short	-511	-568	-545	-599	-652	-911	-868	-955	-1034	-1221	-1207
medium consumption	Supply Level 1	1169	1169	1169	1169	1169	963,7	963,7	963,7	963,7	846,9	636,5
	Supply Level 2	1169	1169	1169	1169	1169	963,9	963,9	963,9	963,9	847	636,6
	Supply Level 3	1169	1169	1246	1268	1268	1357	1429	2022	2022	1906	1976
	Supply Level 4	1169	1169	1246	1246	1246	1041	1141	1141	1141	1024	1094
	S1 Long/Short	-441	-489	-535	-581	-624	-875	-921	-982	-1039	-1206	-1460
	S2 Long/Short	-441	-489	-535	-581	-624	-875	-921	-982	-1039	-1206	-1460
	S3 Long/Short	-441	-489	-457	-481	-525	-482	-456	76	20	-147	-121
	S4 Long/Short	-441	-489	-457	-503	-547	-798	-744	-805	-862	-1029	-1002
low consumption	Supply Level 1	1169	1169	1169	1169	1169	963,7	963,7	963,7	963,7	846,9	636,5
	Supply Level 2	1169	1169	1169	1169	1169	963,9	963,9	963,9	963,9	847	636,6
	Supply Level 3	1169	1169	1246	1268	1268	1357	1429	2022	2022	1906	1976
	Supply Level 4	1169	1169	1246	1246	1246	1041	1141	1141	1141	1024	1094
	S1 Long/Short	-371	-411	-448	-485	-520	-762	-797	-832	-867	-1014	-1255
	S2 Long/Short	-371	-411	-448	-485	-520	-762	-797	-832	-867	-1014	-1255
	S3 Long/Short	-371	-411	-370	-385	-420	-369	-331	227	192	45	84
	S4 Long/Short	-371	-411	-370	-407	-442	-684	-619	-654	-689	-837	-797

Annex IV – Import Export Calc (GWh) – (1/2)

Country	Supply Scena	Demand Scer	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
EU28	EU		8222,4	6280,2	4338,0	2395,8	453,6	-1488,6	-4914,8	-8341,0	-11767,2	-15193,4	-18619,6	-18403,3	-18187,0	-17970,7	-17754,4
Austria	EU		2326,0	1891,0	1456,1	1021,1	586,2	151,2	362,9	574,5	786,2	997,9	1209,5	1163,0	1116,5	1070,0	1023,4
Czech Republi	EU		-14944,6	-13400,1	-11855,6	-10311,2	-8766,7	-7222,2	-7080,3	-6938,5	-6796,6	-6654,7	-6512,8	-6633,8	-6754,7	-6875,7	-6996,6
Germany	EU		-14956,2	-12230,1	-9504,0	-6778,0	-4051,9	-1325,8	-746,6	-167,5	411,7	990,9	1570,1	2360,9	3151,7	3942,6	4733,4
Poland	EU		-1349,1	-1977,1	-2605,1	-3233,1	-3861,2	-4489,2	-4226,3	-3963,5	-3700,7	-3437,8	-3175,0	-3123,8	-3072,6	-3021,5	-2970,3
Slovakia	EU		1046,7	867,6	688,5	509,4	330,3	151,2	-237,3	-625,7	-1014,1	-1402,6	-1791,0	-1900,3	-2009,7	-2119,0	-2228,3
Bulgaria	EU		-8443,4	-8808,6	-9173,7	-9538,9	-9904,1	-10269,3	-10448,4	-10627,5	-10806,6	-10985,7	-11164,8	-11181,1	-11197,4	-11213,6	-11229,9
Croatia	EU		4768,3	4789,2	4810,2	4831,1	4852,0	4873,0	5028,8	5184,7	5340,5	5496,3	5652,2	5633,6	5615,0	5596,4	5577,7
Greece	EU		5710,3	5619,6	5528,9	5438,2	5347,5	5256,8	5045,1	4833,4	4621,8	4410,1	4198,4	4449,6	4700,8	4952,1	5203,3
Hungary	EU		5198,6	5461,4	5724,3	5987,1	6250,0	6512,8	6354,6	6196,5	6038,3	5880,1	5722,0	5508,0	5294,0	5080,0	4866,0
Italy	EU		44159,1	42468,1	40777,1	39086,1	37395,1	35704,1	35201,7	34699,3	34196,9	33694,4	33192,0	32122,1	31052,1	29982,1	28912,2
Romania	EU		-2279,5	-2526,0	-2772,6	-3019,1	-3265,7	-3512,3	-3623,9	-3735,6	-3847,2	-3958,9	-4070,5	-4596,2	-5121,9	-5647,5	-6173,2
Slovenia	EU		-2116,7	-1949,2	-1781,7	-1614,2	-1446,8	-1279,3	-1163,0	-1046,7	-930,4	-814,1	-697,8	-749,0	-800,1	-851,3	-902,5
Neighbours	EU		55440,2	53863,2	52286,2	50709,1	49132,1	47555,1	46843,3	46131,6	45419,8	44708,0	43996,3	42368,1	40739,9	39111,7	37483,5
Neighbours In	EU		59836,4	58338,4	56840,5	55342,5	53844,6	52346,6	51630,2	50913,8	50197,4	49481,0	48764,6	47713,2	46661,9	45610,5	44559,2
Albania	S1 Long/Short	high	0	0	0	0	-2121,91417	-2550,88166	-3001,72029	-3475,54516	-3973,52825	-4496,90127	-5046,95875	-5625,06119	-6232,6385	-6871,19346	-7542,30548
Albania	S2 Long/Short	high	0	0	0	0	-2121,91417	-1902,88166	-1026,72029	-878,945163	-1376,92825	-1425,30127	-1975,35875	-2553,46119	-3161,0385	-3799,59346	-4470,70548
Albania	S3 Long/Short	high	0	0	0	0	-2121,91417	-1902,88166	-1026,72029	-878,945163	-1087,92275	-1110,12827	-1257,85075	-1835,95319	-2443,5305	-3082,08546	-3753,19748
Albania	S4 Long/Short	high	0	0	0	0	-2121,91417	-1902,88166	-1026,72029	-495,695163	-610,428252	-275,551273	-92,358746	-287,211192	-511,538498	-766,843456	-1054,70548
Bosnia Herzig	S1 Long/Short	high	0	0	0	0	3479	3343	2951	2546	2127	1233	787	-913	-1388	-1877	-3028
Bosnia Herzig	S2 Long/Short	high	0	0	0	0	3479	3343	4611	4780,4	4443,7	3549,7	3103,7	1403,7	928,7	439,7	-711,3
Bosnia Herzig	S3 Long/Short	high	0	0	0	0	3479	3369,3	4704,56	5105,82	7630,98	11717,04	16731,4	16061,72	15699,24	17457,31	16766,83
Kosovo	S1 Long/Short	high	0	0	0	0	128	-182	-438	-1242	-3566	-3296	-3513	-3758	-3982	-4241,072	-4508,4343
Kosovo	S2 Long/Short	high	0	0	0	0	128	-182	-354,3	-1158,3	-3482,3	-3212,3	-3429,3	-3674,3	-3898,3	-4157,372	-4424,7343
Kosovo	S3 Long/Short	high	0	0	0	0	128	-182	52,6	-746,4	-2908,4	-115,4	1848,6	1646,6	1431,6	1172,528	988,865696
Macedonia	S1 Long/Short	high	0	0	0	0	2767,9	2550,52	2259,77	1969,02	1689,9	91,15	-211,23	-676,43	-1095,11	-2144,27	-3913,31667
Macedonia	S2 Long/Short	high	0	0	0	0	2767,9	2550,52	2296,77	2006,02	1726,9	128,15	-174,23	-639,43	-1058,11	-2107,27	-3876,31667
Macedonia	S3 Long/Short	high	0	0	0	0	2767,9	2550,52	2559,27	2520,92	2241,8	815,05	1402,37	1584,77	5166,09	4116,93	2347,88333
Macedonia	S4 Long/Short	high	0	0	0	0	2767,9	2550,52	2559,27	2268,52	1989,4	390,65	1095,97	630,77	212,09	-837,07	-2606,11667
Montenegro	S1 Long/Short	high	0	0	0	0	-299,5	-642,74	-788,323275	-935,583763	-1055,81998	-1104,38902	-1921,26767	-2078,14901	-2244,12406	-2405,37356	-2570,44432
Montenegro	S2 Long/Short	high	0	0	0	0	-299,5	-562,74	-661,773275	-703,233763	-823,46983	-872,039019	-1688,91767	-1845,79901	-2011,77406	-2173,02356	-2338,14432
Montenegro	S3 Long/Short	high	0	0	0	0	-299,5	-544,6071	-621,607475	-477,435063	-561,438383	-589,974519	-1256,72027	588,431286	673,489137	536,275542	394,184681
Montenegro	S4 Long/Short	high	0	0	0	0	-299,5	-544,6071	-621,607475	-477,435063	-561,438383	-589,974519	-1256,72027	588,431286	673,489137	536,275542	394,184681
Montenegro	S1 Long/Short	high	0	0	0	0	-299,5	-53,3232755	-200,583763	-320,819983	-369,389019	-1186,26767	-1343,14901	-1509,12406	-1670,37356	-1835,44432
Montenegro	S2 Long/Short	high	0	0	0	0	-299,5	172,26	73,2267245	31,7662365	-88,4699827	-137,039019	-953,917672	-1110,79901	-1276,77406	-1438,02356	-1603,14432
Montenegro	S3 Long/Short	high	0	0	0	0	-299,5	190,3929	113,392525	257,564937	173,561617	145,025481	-521,720272	1323,43129	1408,48914	1271,27254	1129,18468
Montenegro	S4 Long/Short	high	0	0	0	0	-299,5	190,3929	113,392525	257,564937	173,561617	145,025481	-521,720272	1323,43129	1408,48914	1271,27254	1129,18468
Serbia	S1 Long/Short	high	0	0	0	0	-607,7999	-1172,9999	-1263,7999	-1354,5999	-1736,3999	-1962,1999	-2678,9999	-5500,9999	-5965,9999	-7628,9999	-8170,9999
Serbia	S2 Long/Short	high	0	0	0	0	-607,7999	-1172,9999	-1217,5999	-1308,3999	-558,1999	-783,9999	-1500,7999	-4322,7999	-4787,7999	-6450,7999	-6992,7999
Serbia	S3 Long/Short	high	0	0	0	0	-425,7999	-1001,9999	-1001,5999	-957,3999	-156,1999	1185,0001	4644,20011	10077,7001	11968,7001	10611,2502	10498,2502

Annex IV – Import Export Calc (GWh) – (2/2)

Country	Supply Scena	Demand Scer	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Albania	S1 Long/Short	low	0	0	0	0	-1804,74669	-2055,6163	-2314,25924	-2580,91636	-2855,836	-3139,27416	-3431,49481	-3732,77008	-4043,38051	-4363,61538	-4693,77289
Albania	S2 Long/Short	low	0	0	0	0	-1804,74669	-1407,6163	-339,259236	15,6836402	-259,235996	-67,6741635	-359,894813	-661,170075	-971,780511	-1292,01538	-1622,17289
Albania	S3 Long/Short	low	0	0	0	0	-1804,74669	-1407,6163	-339,259236	15,6836402	29,7695039	247,498836	357,613187	56,3379248	-254,272511	-574,507377	-904,66489
Albania	S4 Long/Short	low	0	0	0	0	-1804,74669	-1407,6163	-339,259236	398,93364	507,264004	1082,07584	1523,10519	1605,07992	1677,71949	1740,73462	1793,82711
Bosnia Herzig	S1 Long/Short	low	0	0	0	0	3479	3546	3365	3181	2994	2342	2150	714	516	315	-534
Bosnia Herzig	S2 Long/Short	low	0	0	0	0	3479	3546	5025	5415,4	5310,7	4658,7	4466,7	3030,7	2832,7	2631,7	1782,7
Bosnia Herzig	S3 Long/Short	low	0	0	0	0	3479	3572,3	5118,56	5740,82	8497,98	12826,04	18094,4	17688,72	17603,24	19649,31	19260,83
Bosnia Herzig	S4 Long/Short	low	0	0	0	0	3479	3572,3	5118,56	5740,82	8497,98	12826,04	18094,4	17688,72	17603,24	19649,31	19260,83
Kosovo	S1 Long/Short	low	0	0	0	0	576	559	445	-193	-2492	-2186	-2377	-2588	-2783	-2900,9387	-3020,89415
Kosovo	S2 Long/Short	low	0	0	0	0	576	559	528,7	-109,3	-2408,3	-2102,3	-2293,3	-2504,3	-2699,3	-2817,2387	-2937,19415
Kosovo	S3 Long/Short	low	0	0	0	0	576	559	935,6	302,6	-1834,4	994,6	2984,6	2816,6	2630,6	2512,6613	2476,40585
Macedonia	S1 Long/Short	low	0	0	0	0	3512,22	3387,88	3190,17	2992,46	2806,38	1300,67	1114,59	928,51	742,43	-97,39	-1726,87667
Macedonia	S2 Long/Short	low	0	0	0	0	3512,22	3387,88	3227,17	3029,46	2843,38	1337,67	1151,59	965,51	779,43	-60,39	-1689,87667
Macedonia	S3 Long/Short	low	0	0	0	0	3512,22	3387,88	3489,67	3544,36	3358,28	2024,57	2728,19	7189,71	7003,63	6163,81	4534,32333
Macedonia	S4 Long/Short	low	0	0	0	0	3512,22	3387,88	3489,67	3291,96	3105,88	1600,17	2421,79	2235,71	2049,63	1209,81	-419,67667
Montenegro	S1 Long/Short	low	0	0	0	0	-299,5	-574,26	-647,361525	-717,333688	-755,350006	-725,794696	-1443,12815	-1505,33046	-1571,53107	-1629,56766	-1686,98281
Montenegro	S2 Long/Short	low	0	0	0	0	-299,5	-494,26	-520,811525	-484,983688	-523,000006	-493,444696	-1210,77815	-1272,98046	-1339,18107	-1397,21766	-1454,68281
Montenegro	S3 Long/Short	low	0	0	0	0	-299,5	-476,1271	-480,645725	-259,184988	-260,968406	-211,380196	-778,580752	1161,24984	1346,08213	1312,07844	1277,64619
Montenegro	S4 Long/Short	low	0	0	0	0	-299,5	-476,1271	-480,645725	-259,184988	-260,968406	-211,380196	-778,580752	1161,24984	1346,08213	1312,07844	1277,64619
Montenegro	S1 Long/Short	low	0	0	0	0	-299,5	160,74	87,6384755	17,6663116	-20,3500057	9,20530383	-708,128152	-770,33046	-836,531075	-894,567659	-951,982809
Montenegro	S2 Long/Short	low	0	0	0	0	-299,5	240,74	214,188475	250,016312	211,999994	241,555304	-475,778152	-537,98046	-604,181075	-662,217659	-719,682809
Montenegro	S3 Long/Short	low	0	0	0	0	-299,5	258,8729	254,354275	475,815012	474,031594	523,619804	-43,5807524	1896,24984	2081,08213	2047,07844	2012,64619
Serbia	S1 Long/Short	low	0	0	0	0	3374,6001	3805,0001	4230,6001	4656,2001	4790,8001	5081,4001	4881,0001	2212,2001	1900,4001	390,6001	1,8001
Serbia	S2 Long/Short	low	0	0	0	0	3374,6001	3805,0001	4276,8001	4702,4001	5969,0001	6259,6001	6059,2001	3390,4001	3078,6001	1568,8001	1180,0001
Serbia	S3 Long/Short	low	0	0	0	0	3556,6001	3976,0001	4492,8001	5053,4001	6371,0001	8228,6001	12204,2001	17790,9001	19835,1001	18630,8502	18671,0502
Albania	S1 Long/Short	medium	0	0	0	0	-1962,56873	-2300,87022	-2653,03718	-3019,63789	-3401,26393	-3798,53111	-4212,0805	-4642,57943	-5090,72259	-5557,23313	-6042,86385
Albania	S2 Long/Short	medium	0	0	0	0	-1962,56873	-1652,87022	-678,037184	-423,037895	-804,66393	-726,931111	-1140,4805	-1570,97943	-2019,12259	-2485,63313	-2971,26385
Albania	S3 Long/Short	medium	0	0	0	0	-1962,56873	-1652,87022	-678,037184	-423,037895	-515,65843	-411,758111	-422,972499	-853,471429	-1301,61459	-1768,12513	-2253,75585
Albania	S4 Long/Short	medium	0	0	0	0	-1962,56873	-1652,87022	-678,037184	-39,7878948	-38,1639301	422,818889	742,519501	695,270571	630,377415	547,116872	444,736147
Bosnia Herzig	S1 Long/Short	medium	0	0	0	0	3479	3415	3098	2772	2438	1633	1281	-320	-690	-1070	-2105
Bosnia Herzig	S2 Long/Short	medium	0	0	0	0	3479	3415	4758	5006,4	4754,7	3949,7	3597,7	1996,7	1626,7	1246,7	2117
Bosnia Herzig	S3 Long/Short	medium	0	0	0	0	3479	3441,3	4851,56	5331,82	7941,98	12117,04	17225,4	16654,72	16397,24	18264,31	17689,83
Kosovo	S1 Long/Short	medium	0	0	0	0	367	188	66	-717	-3029	-2741	-2945	-3173	-3382	-3567,9008	-3758,41194
Kosovo	S2 Long/Short	medium	0	0	0	0	367	188	149,7	-633,3	-2945,3	-2657,3	-2861,3	-3089,3	-3298,3	-3484,2008	-3674,71194
Kosovo	S3 Long/Short	medium	0	0	0	0	367	188	556,6	-221,4	-2371,4	439,6	2416,6	2231,6	2031,6	1845,6992	1738,88806
Macedonia	S1 Long/Short	medium	0	0	0	0	3140,06	2969,2	2724,97	2480,74	2248,14	695,91	451,68	126,04	-176,34	-1120,83	-2820,09667
Macedonia	S2 Long/Short	medium	0	0	0	0	3140,06	2969,2	2761,97	2517,74	2285,14	732,91	488,68	163,04	-139,34	-1083,83	-2783,09667
Macedonia	S3 Long/Short	medium	0	0	0	0	3140,06	2969,2	3024,47	3032,64	2800,04	1419,81	2065,28	6387,24	6084,86	5140,37	3441,10333
Macedonia	S4 Long/Short	medium	0	0	0	0	3140,06	2969,2	3024,47	2780,24	2547,64	995,41	1758,88	1439,24	1130,86	186,37	-1512,89667
Montenegro	S1 Long/Short	medium	0	0	0	0	-299,5	-608,5	-717,5	-825,4	-903,4	-911,4	-1676,4	-1783,4	-1896,4	-2002,4	-2109,4
Montenegro	S2 Long/Short	medium	0	0	0	0	-299,5	-528,5	-590,05	-593,05	-671,05	-679,05	-1444,05	-1551,05	-1664,05	-1770,05	-1877,1
Montenegro	S3 Long/Short	medium	0	0	0	0	-299,5	-510,3671	-550,7842	-367,2513	-409,0184	-396,9855	-1011,8526	883,1803	1021,2132	939,2461	855,229
Montenegro	S4 Long/Short	medium	0	0	0	0	-299,5	-510,3671	-550,7842	-367,2513	-409,0184	-396,9855	-1011,8526	883,1803	1021,2132	939,2461	855,229
Montenegro	S1 Long/Short	medium	0	0	0	0	-299,5	126,5	17,5	-90,4	-168,4	-176,4	-941,4	-1048,4	-1161,4	-1267,4	-1374,4
Montenegro	S2 Long/Short	medium	0	0	0	0	-299,5	206,5	144,05	141,95	63,95	55,95	-709,05	-816,05	-929,05	-1035,05	-1142,1
Montenegro	S3 Long/Short	medium	0	0	0	0	-299,5	224,6329	184,2158	367,7487	325,9816	338,0145	-276,8526	1618,1803	1756,2132	1674,2461	1590,229
Serbia	S1 Long/Short	medium	0	0	0	0	1383,4001	1316,0001	1483,4001	1650,8001	1527,2001	1559,6001	1101,0001	-1644,3999	-2032,7999	-3619,1999	-4084,5999
Serbia	S2 Long/Short	medium	0	0	0	0	1383,4001	1316,0001	1529,6001	1697,0001	2705,4001	2737,8001	2279,2001	-466,1999	-854,5999	-2440,9999	-2906,3999
Serbia	S3 Long/Short	medium	0	0	0	0	1565,4001	1487,0001	1745,6001	2048,0001	3107,4001	4706,8001	8424,20011	13934,3001	15901,9001	14621,0502	14584,6502