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# ENERGY AND ITS IMPACT ON DEVELOPMENT IN SOUTHEAST EUROPE AND THE BLACK SEA AREA

***POLICY PAPER***

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# *Energy and its impact on development in Southeast Europe and the Black Sea area*

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# Introduction

The aim of this paper is twofold: first, to examine to which extent energy sector can foster development in Balkans-Black sea area and second, to examine to which extent exporting EU policies and institutions in energy sector supports balancing commercial, political and social interest in the region. For the purpose of this paper Balkans-Black Sea region includes EU member states (memebers of the Energy Union: Greece, Romania, Bulgaria and Croatia), the Energy Community contracting parties (Western Balkans 6: Macedonia, Serbia, Montenegro, Bosnia and Herzegovina, Albania, Kosovo) and Turkey.

The region is strategically located between the regions rich in fossile fuels (Russia, Caspian states and the Middle East) and main Central and West European markets. The starting hypothesis is that relevance of energy sector for the countries in the reigion and their strategic and geopolitical importance for the EU in providing access to energy sources and diversifying routes could, with time, serve as a basis for strengthening regional cooperation and promoting regional interests.

First, key economic and energy issues in the region are presented and discussed. Next, policies and regional organisations are presented, including planned energy infrastructure projects. Based on the above, relevance of these projects for the countries concerned and their development potential is evaluated. Finally, conclusions and recommendations are formulated.

# Key economic and energy issues

Socio-economic snapshot

The countries of Balkans- Black sea area are very diverse (Table 1) .The largest country of the region (Turkey) has more than hundred times more inhabitants than the smallest (Montenegro, 74 and 0.5 million of inhabitants, respectively) and almost 200 times higer GDP. The countries also face opposing demographic trends: all the countries of the region except Turkey are faced with depopulation. The recovery afer the 2008 crisis has also been uneven: Serbia, Croatia and Greece were heavily hit with long recession and slow recovery, while Bulgaria, Macedonia and Turkey experienced much faster growth.

## *Table 1*
## *Population and GDP*

| | Country | Population, 000 inhatitantns | | GDP, million euros | | GDP per capita, Euro, current prices | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2008 | 2015 | 2008 | 2015 | 2004 | 2008 | 2010 | 2012 | 2014 | 2015 |
| 1 | Albania | 2.947 | 2.889 | 8800 | 9268 | 16001 | 2986 | 3088 | 3300 | 3400 | 3600 |
| 2 | Bosnia and Herzegovina | 3.8402 | 3.819 | 13040 | 14594 | n/a | 3394 | 3372: | 3500 | 3600 | 3800 |
| 3 | Bulgaria | 7492 | 7.197 | 37200 | 45287 | 2700 | 5000 | 5200 | 5700 | 5900 | 6300 |
| 4 | Croatia | 4.312 | 4.213 | 48130 | 43847 | 7800 | 11200 | 10500 | 10300 | 10200 | 10400 |
| 5 | Greece | 11.077 | 10.858 | 241990 | 175698 | 17700 | 21800 | 20300 | 17300 | 16300 | 16200 |
| 6 | Romania | 20.537 | 19.819 | 142396 | 160353 | 2900 | 6900 | 6300 | 6700 | 7600 | 8100 |
| 7 | Serbia | 7.350 | 7.095 | 33705 | 33491 | 2700 | 4600 | 4100 | 4400 | 4700 | 4700 |
| 8 | Turkey | | 74.724 | 498602 | 645394 | 40001 | 7064 | 7585 | 8200 | 7800 | 8300 |
| 9 | Kosovo | | 1.7721 | n/a | 5568 | n/a | n/a | n/a | 2800 | 3100 | |
| 10 | Macedonia | 2.046 | : | 6772 | 90614 | | 3308 | 3300 | 3500 | 3700 | |
| 11 | Montenegro | | 622 | 3086 | 3624 | | 4907 | 5045 | 5100 | 5600 | 5800 |

*Source: Eurostat, 2017.*

Differences in socio-economic conditions among the states of the region make identification and pursuing of common economic and energy interests difficult. Despite differences, there are some common features that might help in formulating regional interests.

# Energy consumption

Per capita primary energy consumption of countries of the region is about half of that of more developed countries (illustrated by OECD data: Table 2, TPES/pop). Energy intensity (measured as consumption of energy per GDP) is generally higher than OECD-average, but there are significant differences among countries. Energy intensities of Greece, Croatia and Turkey are comparable with the OECD average, while energy intensity inMontenegro is twice as high.Energy intensity of Bulgaria and Kosovo are three times higher than OECD average, and in the BiH it is four(Table 2, TPES/GDP). High energy intensity in the Balkan-Black Sea region shows that countries are lagging behind OECD average in economic and energy transitions.[1]

[1] Data for 2003
[2] Data for 2011

[1] The statistical relation between energy intensityand the level of competitiveness implies that countries that are more competitive use energy more efficiently.

*Table 2*

## *Energy production, import and total primary energy supply, 2008 and 2014*

| | | Energy production, Mtoe | | Net energy imports, Mtoe | | Energy import dependency, % | | TPES , Mtoe | | TPES/pop | | TPES/GDP | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2008 | 2014 | 2008 | 2014 | 2008 | 2014 | 2008 | 2014 | 2008 | 2014 | 2008 | 2014 |
| 1 | Albania | 1,15 | 2,01 | 1,13 | 0,67 | 54% | 29% | 2,09 | 2,34 | 0,66 | 0,81 | 0,37 | 0,18, |
| 2 | Bosnia and Herzegovina | 4,34 | 6,05 | 1,63 | 1,71 | 27% | 22% | 5,99 | 7,82 | 1,59 | 2,05 | 0,71 | 0,44 |
| 3 | Bulgaria | 10,24 | 11,36 | 10,50 | 6,45 | 53% | 36% | 19,78 | 17,90 | 2,59 | 2,48 | 1,01 | 0,34 |
| 4 | Croatia | 3,95 | 4,35 | 5,51 | 3,62 | 61% | 45% | 9,8 | 8,04 | 2,05 | 1,90 | 0,30 | 0,14 |
| 5 | Greece | 9,86 | 8,80 | 25,16 | 16,93 | 84% | 73% | 30,10 | 23,31 | 2,71 | 2,12 | 0,81 | 0,09 |
| 6 | Romania | 28,78 | 26,37 | 10,65 | 5,36 | 27% | 17% | 39,38 | 31,69 | 1,83 | 1,59 | 0,64 | 0,17 |
| 7 | Serbia | 9,92 | 9,44 | 6,38 | 3,72 | 40% | 28% | 16,03 | 13,26 | 2,18 | 1,86 | 1,16 | 0,35 |
| 8 | Turkey | 28,98 | 31,35 | 72,52 | 93,72 | 74% | 77% | 98,50 | 121,54 | 1,39 | 1,59 | 0,26 | 0,14 |
| 9 | Kosovo | - | 1,62 | - | 0,60 | | 27% | - | 2,21 | - | 1,21 | - | 0,34 |
| 10 | Macedonia | 1,72 | 1,27 | 1,40 | 1,38 | 45% | 53% | 3,10 | 2,62 | 1,52 | 1,26 | 0,70 | 0,26 |
| 11 | Montenegro | - | 0,69 | - | 0,29 | | 30% | - | 0,96 | - | 1,54 | -- | 0,22 |
| | OECD | | 4144 | | 1322 | | | | 5273 | | 4,16 | | 0,11 |

*Source: IEA (2016)*

## *Energy production*

Hydropower and coal are most commonly used energy sorces (see Annex). Most of the countries of the region produce coal (exception being Croatia) and crude oil (exceptions are Bosnia and Herzegovina, Kosovo and Montenegro). There is no production of oil products in the region, while availability of gas and nuclear power varies significantely (see Annex).

Gas is not used nor produced in Kosovo and Montenegro. BiH and Macedonia do not produce it, but use it in small amoutns. Croatia and Romania are the only countries in the region with significant gas production. In the wider Black Sea area, Azerbaijan and Ukraine are also in that position. Recent explorations have positively identified considerable, commercially viable offshore gas deposits in the Black Sea territorial waters and exclusive economic zone of Romania and, potentially, Turkey, Bulgaria and Georgia.

Nuclear energy is currently produced only in Bulgaria and Romania. There are various approaches towards nuclear issues. In Turkey, plans for nuclear power are a key aspect of the country's aim for economic growth[3], while most of the Western Balkans countires do not plan nuclear utilities.

The importance of renewable enregy sources (RES) and energy efficiency is increasing, but the potential of renewables is still underutilised. Similarly, changes in energy consumpiton as well as available financing instruments show that energy efficiency is not very high on the agenda[4].

Generally, many countries in the region depend heavily on coal (lignite) for power generation, and in the Western Balkans on hydroelectricity: Albania relyies almost 100% on hydro, while Kosovo depends 100% on lignite (see table 3) and the other countries enjoy a mix based on oil and gas. On the other hand, in the East Balkans the energy mix for power generation is more diversified. Bulgaria and Romaina make more use of gas and also use nuclear energy, whereas Greece and Turkey rely heavily on lignite and steam coal with growing inputs from RES (including wind, photovoltaic and hydro electricity).

Another common feature of theregion (with the exception of Greece and Turkey) is that key elements of the region's energy infrastructures (e.g. gas pipelines, major thermal power plants) were built in the 1960s and 1970s. This concentration in age and type of technology, combined with inadequate maintenance, creates urgent need for investments in modrenisation, rehabilitation and replacement of ageing infrastructure[5].

[2] Total primary energy supply (TPES) is made up of production + imports – exports – international marine bunkers – international aviation bunkers ± stock changes

[3] Three nuclear power projects are being prepared: Akkuyu , to be built by Rosatom, Sinop, which is to be built by a Franco-Japanese consortium and China is in line to build the third plant, with US-derived technology (c.f. World Nuclear Association, 2016).
[4] For more about energy efficiency see policy section of this paper.
[5] The need for rehabilitation and modernisation is well known and elaborated. For instance, European Commission financed the Regional Balkans Infrastructure Study, managed by the World Bank (REBIS-

## *Table 3*
## *Planned power generation capacity by 2020 compared to 2012*

| MW el | Albania | | BH | | Croatia | | Macedonia | | Montenegro | | Serbia | | Turkey |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2012 | 2020 | 2012 | 2020 | 2012 | 2020 | 2012 | 2020 | 2012 | 2020 | 2012 | 2020 | |
| Coal | 0 | 1372 | 1855 | 1870 | 330 | | 818 | 1352 | 210 | 1144 | 3914 | 4686 | |
| Gas | 0 | | 0 | 1050 | 999 | | 280 | 300 | 0 | 356 | 336 | 2540 | |
| Oil/dual fuel | 9 | 120 | 0 | 730 | 786 | | 210 | 300 | 0 | | 0 | 450 | |
| Nuclear | 0 | | 0 | | 398 | | 0 | | 0 | | 0 | | 5%, 300 |
| Hydro | 1480 | | 2188 | | 2191 | | 538 | | 676 | | 2883 | | |
| Renewable (other than hydro) | 0 | 1191 | 46 | | 180 | | 0 | 752 | 0 | | 3 | 251 | |
| Total | 1577 | 61 | 4089 | | 4884 | | 1846 | | 886 | | 7136 | | |

*Source: Energy Community Secretariat, 2013, Serbia energy strategy*

## *Energy demand*

There is no uniform trend in energy demand within the region (see Table 2 and Annex).TPES in 2014 in Bulgaria, Croatia, Greece, Romania, Turkey and Macedonia was smaller compared to 2008, while other countries of the region experienced increase.

In most countries projected is grrowth of energy demand in the short term (until 2020, see Table 4)



## *Table 4*
## *Growth scenarios and targets*

| | GDP growth | Energy demand anngrowth | Renewable energy sources | | Energy efficiency target |
|---|---|---|---|---|---|
| | %, annually | %, annually | share2009 share | 2020 target | target%, |
| Albania | 4.5 | 2 | 31,2 | 38 | 9 (2018) |
| Bosnia and Herzegovina | 3.6-6.2 | 2-3.2 | 34,0 | 40 | 9.2 (2018) |
| Bulgaria | | | 12,1 | 16 | 16,9 (2020) |
| Croatia | n/a | 2.7-3.1 | 23,6 | 20 | 9 (2016) |
| Greece | | | 8,5 | 18 | 24,7(2020) |
| Kosovo | 2.4-8.3 | n/a | 18,9 | 25 | 9 (2018) |
| Macedonia | 5.7 | 2.2-2.6 | 21,9 | 28 | 9 (2018) |
| Montenegro | 5.2-6.8 | 1.7-2.8 | 26,3 | 33 | 9 (2018) |
| Romania | | | 22,7 | 24 | 43 (2020) |
| Serbia | 3 | 1-.11 | 21,2 | 27 | 9 (2018) |
| Turkey | | | | | |

*Source: Energy Community secretariat,2013, Serbia Energy Strategy, 2014*

## *Table 5*
## *2020 forecast, total primary energy and electricity supply*

| | Total primary energy supply 2020, Mtoe | Electricity, GWh | | | |
|---|---|---|---|---|---|
| | | Production | Import | Export | Supply |
| Albania | 2.664-2.957 | 10467 | 9 | 0 | 10497 |
| Bosnia and | 6.884-7.332 | 25836 | 407 | -4047 | 22223 |
| Croatia | n/a | 36723 | 2697 | n/a | 29420 |
| Kosovo | 2.371-3.735 | 9123 | 0 | 1591 | 7532 |
| Macedonia | 4.212 | 10150 | 2 | 0 | 10152 |
| Montenegro | 1.942 | 6970 | 0 | 1291 | 5679 |
| Serbia | 9.756-10.676 | | | | |
| Turkey | | | | | |

*Source: Energy Community Secretariat, 2013. Serbia's energy Strategy*

Available projections for the period until 2030 (with projections for year 2020, 2025 and 2030) show increase in total final energy consumption. Continuation of current trends would lead to shortcomings in electricity between 15.1 TWh (in 2020) and 36.1 TWh (in 2030) in Western Balkan 6 and Croatia (Energy Community Secretariat, 2013:27). To avoid such shortcomings, investments of minimal 15,1 billions euros are needed until 2020 (23,7 billions until 2025 and 35,2 billions until 2030; Energy Community Secretariat, 2013).

On the other hand, main drives of energy demand are generally population and economy. Depopulation trends (exception being Turkey), together with new investments (increase in energy efficiency, use of renewable energies, technological development) should diminish demand. Such development is not projected in official strategic documents, indicating traditional approach to energy issues.

## *Import dependancy*

Given the limited availability of energy source, there is significant import dependency, which varies within the region (between 17 and 73%, see Table 2) and during the time (e.g. increased in Turkey or Macedonia while decreased in Croatia, Ablania, Bulgaria). Almost all countries (with the exception of Romania and Croatia) depend heavily on hydrocarbon imports (see Annex), prmarily oil and gas.In short to medium term,oil and gas consumption are likely to increase due to the expected economic growth (see Table 6). Thus the energy security situation is bound to worsen, which might impede development. As a result, new energy routes and sources are of significant importance – both from economic and politicial perspective. First, new sources and supply routes are needed in countries of the region to meet their own energy needs. Second, new transit routes increase region's geopolitical importance.

*Table 6*
***Planned crude oil and petroleum products, 2021, ktoe***

| ktoe | Domestic production | Import | Export | Power | Industry, commercial | Residential | Transport |
|---|---|---|---|---|---|---|---|
| Albania | 702 | 1506 | 450 | - | 166+137 | 57 | 1137 |
| Bosnia and Herzegovina | 1480 | 1730 | 1640 | 30 | 80 | 10 | 1420 |
| Kosovo | 37 | 663 | | - | 133+63 | 35 | 455 |
| Macedonia | - | 1381 | 366 | | | | |
| Montenegro | - | 643 | - | - | 211+34 | 13 | 385 |
| Serbia | | | | | | | |
| Turkey | | | | | | | |

## *Energy mix*

While the structure of the energy mix is diverse, most of the energy markets witin the region significantly depend on fossil fuels, predominantely imported (See Annex). Shares of solid fuels (mainly coal and lignite) and oil are relatively stable ( based on 2005, 2010 and 2014 data, see Annex). The role of natural gas is also important, and increasingly important to the energy mix of the various countries of the region, both for power generation and domestic use. The use of gas has experienced impressive expansion in Turkey in last 10 years, while in the other countries it remained on the approximately the same levels. Its further use, especially in Western Balkans, is hampered by poor infrastructure, including lack of adequate cross border interconnections.

Dominance of fossil fuels implies significant decarbonising potential, but the transition might be difficult due to importance of industry for economy and employment.

The share of renewables is increasing. E.g. in Turkey and Greece the production from geothermal and solar plants increased four fold in 2005-2014 period, and exceeds hydro power. On the other hand, according to the latest IEA data, production from this types of facilities in BiH, Serbia and Kosovo was non-exitant in 2014 (IEA, 2016, see also Annex).

Nuclear's share for power generation is small and stable[6].

## *Policies*

The implementation of the EU energy acquis (related to security of supply, the internal energy market, energy efficiency, renewable energy sources, nuclear energy, nuclear safety and radiation protection) and relevant targets (such as renewables targets, energy efficiency targets and decarbonisation goals) foster changes in energy mix of the member states (Greece, Bulgaria, Romania, Croatia). Energy acquis also provides a roadmap for energy transition until 2050. Structural change in energy sector is expected to contribute to climate sustainability, greater energy security and increased efficiency and productivity, on the EU and level of indivudal member states. Potential benefits for indivudiual memeber states include issues related to energy security, internal market, energy efficiency, decarbonisation and thechnological development (see Table 7). Benefits related to internal energy market are identified for all member states, as common energy market, planned to be established by the Energy Union, enables production of energy where it is the cheapest and delivery to where it is needed. As the EU is the largest energy importer in the world, importing 53% of its energy at an annual cost of around €400 billion, this is of particular interest and drives many aspects of energy policies. Other categories of benefits are not imminent to all member states.

[6] It should be noted that in some tables here we present nuclear energy for Croatia: Croatia owns ½ of NPP Krško, located in Slovenia and has no nuclear facilities on its own territory.

So far, the EU energy tranistion has led to changing of energy mix, primarily increasing share of renewables. During 2016, net new capacity added in EU was virtually 100% renewables.[7] Some cities set 100% renewable goals.[8] Given the availability of natural gas globally, lower long-term prices and smaller emissions compared to other fossil fuels, natural gas is considered as bridging fuel during the shift to renewables, as there is still no effective utility-scale solution to the intermittency in renewable generation. More traditional generation assets, particularly coal, are being phased out or converted to biofuels. Size of nuclear sector (25% of electricity consumend in the EU) indicates that changes in nuclear's role in the generation mix will take time, especially considering significant differences in national energy policies.[9]

*Table 7*
## *Benefits of the Energy Union for Croatia, Romania and Bulgaria, Greece*

| | Croatia | Romania | Bulgaria | Greece |
|---|---|---|---|---|
| Energy security | Diversification of European gas sources, suppliers and routes and better coordination of emergency response mechanisms among Member States will further strengthen Croatia's energy security situation | | The diversification of European gas sources, suppliers and routes and the better coordination of emergency response mechanisms among Member States will significantly help to provide adequate level of energy security for Bulgaria.<br>The funding of critical infrastructure (domestic grids and interconnections) and the reinforcing of regional cooperation (High Level Group on Central East South Europe Connectivity) are also important elements of the Energy Union Strategy with direct benefits for Bulgaria. | |
| Internal energy market | A completed internal energy market will support Croatia's efforts for regional cooperation on generation adequacy, which will be more cost-effective than a national approach.<br>The diversification of gas supplies sources will provide the possibility to moderate gas prices in Croatia. | Market integration of renewables and regional cooperation in relation to support schemes will increase the cost-effectiveness of Romania's renewable production.<br>Electricity interconnections and enhanced cross-border trade will help control electricity prices and increase Romania's security of electricity supply.<br>The completion of gas interconnections and reverse flow projects will support increased exploitation of domestic gas sources. | A completed internal energy market combined with strong regional cooperation will provide more cost-effective options on dealing with generation adequacy.<br>Bulgaria's structural overcapacity in electricity generation can ensure affordable prices to domestic consumers and offer export opportunities in an integrated regional electricity market. | Full integration of Greece intothe EU's electricity and gas markets and convergence upon the EU electricity target model will increase competition onGreece's electricity and gas markets.<br>Aligningthe Greek gas retail market to EU standardsfor market liberalisation will ensure that Greece can benefit optimally from the gas-to-gas competition that will evolve when gas sources have become more diversified. |
| Decarbonisation | EU 2030 Framework for Climate and Energy can contribute to maintaining public acceptance of the energy transition. | | | The EU 2030 Framework for Climate and Energy will provide additional opportunities to further develop Greece's potential for renewable energyand hence can contribute to maintaining public acceptance of the transition to a greener energy sector. A move towards the EU electricity target model will allow for aneven deeper renewablesintegration by providing for proper investment signals. |
| Energy Efficiency | The Energy Union will strengthen the targeted use of financial instruments for increased investments particularly in the transport and buildings sector. In Croatia, significant contributions can be expected from the European Structural and Investment Funds and the European Fund for Strategic Investment. The revenues from auctioning of ETS allowances will also contribute to investment in climate and energy. | The Energy Union will strengthen the targeted use of financial instruments for increased investments particularly in the transport and buildings sector. It will help ensure that Romania harvests the economic and other benefits of reducing its much-higherthan-average energy intensity. | The Energy Union will strengthen the targeted use of financial instruments. This will trigger investments in areas where Bulgaria has significant energy savings potential (e.g. transport and industry) and help to improve the energy efficiency of residential buildings, thereby reducing energy costs for households | The Energy Union will strengthen the targeted use of financial instruments for increased investments also for Greeceparticularly in the transport and buildings sector, e.g. through the European Structural and Investment Fund.<br>Investments in energy efficiency can reduce energy bills of Greece's vulnerable customers and enterprises whilst providing a much needed boost to the constuction sector. |

[7] Net European generation capacity during 2016 increased by 7 GW. Close to 75% of new capacity comes from wind (44%) and solar (29%). While some new coal (16%) and gas (6%) capacity was added, far more coal and gas assets were decommissioned.
[8] Gussing reached 100% renewable target. Munich, Copenhagen and Malmo set 100% renewable target for 2025. For more seehttp://www.go100percent.org
[9] New plants are under construction in France, Finland and Slovakia, while nuclear decommissioning program has been accelerated is Germany

| | | | | |
|---|---|---|---|---|
| Research and innovation | The Energy Union's new strategy for Research and Innovation (including an upgrade of the Strategic Energy Technology Plan) can support Croatia's progress on low-carbon technology developmen | The Energy Union's new strategy for Research and Innovation can support Romania's progress on low-carbon technology development. | | The Energy Union's new strategy for Research and Innovation can support Greece'sprogress on low-carbon technology development. |

*Source: authors, based on European Commission (2015), European Commission (2015a), European Commission (2015b), Europen Commission (2015c)*

In order to ensure its energy policy goals (primarily related to security of supply and decarbonisation) the EU also tries to export its standards, policies, and regulations. The most effective EU's foreign policy, enlargement, is about to reach its limits. Thus, enlargement process is less motivating for the implementation of reforms. New solutions are needed for neighbouring regions (Western Balkans, Mediterranean and Eastern neighbours).The EU offered energy market integration through participating in the Energy Community to countries of the South East Europe (SEE) and to Eastern neighbours. The Energy Community should (i) improve and sustain economic development in its member countries, (ii) diversify supply of gas and electricity and (iii) help to achieve lasting peace and stability in the region and improving the security of private citizens (European Commission, 2005) . This should be beneficial for the EU and its partners, both (see Table 8).

## *Table 8*
## *The EU's formal reasons for launching the Energy Community*

| | The Energy Community | Benefits for the region | Benefits for the EU |
|---|---|---|---|
| 1. | Improve and sustain economic development in South Eastern Europe | Innovation is a tool for improving and sustaining economic development in theregion, technology transfer | Technology transfer, related to market access |
| 2 | Diversifyg supply of gas and electricity | Increased security of supply | Security of supply- new routes for conventional sources (EnCT) and new sources - renewbales (Medreg) |
| 3. | Achieve lasting peace and stability in the region and improving the security of private citizens in the SEE | General security | General security |

*Source: Boromisa (2014)*

The access to energy sources is the common interest of EU member states and non mmbers countries. The Energy Community's Ministerial Council, consisting of the Ministers of Energy of the member states and EU representatives takes strategic decisions (such as on extension of the relevant acquis, membership), gives directions, or formally adopts secondary legislation. Establishment of regional institutions that can take strategic decisions provides indicates that the Energy Community is more than mere extension of the EU acquis. It might evolve into organisation that formulates and promotes regional interests, thus strengthens negotiation position of its members towards main investors or suppliers.

However, there are significant differences over a wide spectrum of economic and social parameters within the Energy Community, which makes establishing integrated strategies for the area very challenging. Also, implementation of commitmetns is slow and partial (see table 9). However, it should be noted that the EU policy instruments are not necessarily well suited for countries (or even region) of Balkans-Black Sea Area.[10] The priorities are seen much differently from the Balkan-Black Sea region, especially when it comes to the development of indigenous energy sources. While energy efficiency, renewables, decarbonisation and market issues are high on the EU agenda, in the Balkan-Black sea region the most important strategic issues relate to the diversification of energy routes and new gas suppliers.

## *Table 9*
## *Alignment with non-EU countries of the region with the EU energy acquis*

| | Overall | security of supply | the internal energy market | energy efficiency | renewable energy sources | nuclear energy, safety and radiation protection |
|---|---|---|---|---|---|---|
| Turkey | Moderately aligned | Significant progress | Good progress electricity Need to complete gas market reform (third party access, unbundling) | No progress | Good progress | No progress |
| Serbia | moderately prepared | High level of alignment | primary legislation is compliant with the EU's third energy package but secondary legislation in the gas sector has yet to be completed and implemented. | Partialy coherent | by-laws need to be passed to allow full implementatio | partially in line with the *acquis* |

[10] This can be illustrated by experience of Greece, which suffered from continuous contraction over the last six years and Bulgaria and Romania where rapid RES growth was followed by deflation within 3-4 year period.

| | | | | | | |
|---|---|---|---|---|---|---|
| Kosovo | Early stage, some progress | Needs improvement (reliability of transmission, investment in distribution) | Does not participate in Western Balkans 6 MoU, laws from 2016 | Need alignment with EU rules, action plans, funds, institutional capacity | Very little progress | Early stage of preparing regulatory and legal framework |
| Albania | Moderately aligned, some progress | Early stage | Legal framework adopted, implementing legislation missing | Needs engnhnacing the capacity | Early stage | No progress |
| Montenegro | Moderate/ good level; good progress | Adopted policy, im-plementation missing (level of stocks close to zero) | Third energy package transposed, implementing legislation missing | Partially transposed rules | Acition plan available, no funds | Does not have industry |
| Bosnia and Herzegovina | Early stage, some progress | Failing to address adequately security of supply, diversification, use of indigenous resouce | Not aligned with third energy package | not have a national energy efficiency action plan in line with the EnC requirement | no state-level legal framework on renewable energy. The legislation at entity level is not compliant with the EU *acquis*. | *NO nuclear power industry* |
| Macedonia | Moderately prepared | Some progress | NO progress, not aligned with the third energy package | Adopted national plan, target of 21% for 2020 is not in line with mandatory target ofd 28%, lack of funding | Partially transposed | *Ratified important international convencion, does not have long term and safe radioactive waste facility, no plans for NPP* |

*Source: authors, based on European Commission 2016, European Commission 2016a, European Commission 2016b, European Commission 2016c, European Commission 2016d,European Commission 2016e, European Commission 2016f*



Based on differences in prioritysing and scope of the necessary actions (e.g. national or regional approach), two broadly defined types of activites can be identified: first relate to renewables, grid modernization, and distributed energy resources. These are primarily to be dealt with on national level. The second line of activities (and related investments) concerns traditional generation and trading, which requires more regional cooperation. Streamlining priorities is supported by the EU and the Energy Community, both, have developed investments plans based on common interest of the countries involved.

## *Investment plans*

The EU and World Bank have been promoting cost-effective expansion of generating capacity within the region, that would produce a more diversified mixture, including new technology, more efficient lignite power plants (with less $CO_2$ emissions), gas-fired combined cycle and CHP, and renewables including hydropower. Such development would support a more sustainable energy mix for the region and would lower its carbon and overall energy intensity. However, the political and economic conditions do not offer stability necessary for regional energy generation facilities.

Thus, the projects of common interest (Projects of Energy Commmunity Interest - PECI) are mostly transmission/ transport networks, considered to be relevant for the Energy Community memeber states as well as for Croatia, Romania, Bulgaria and Turkey. Namely, mechanism for operation of energy markets under Energy Community Treaty applies equally to Energy Commmunity members and EU members form Balkans-Black Sea region.[11]

PECI include 6 electricity projects, three gas projects and one oil pipeline (Table 10). Five electricityPECI projects aim at creation of aregional electricity market (Trans-Balkan corridor) through the constructionof a 400 kV transmission corridor between Montenegro, Serbia and Bosnia and Herzegovina. All 10 PECI projects should benefit from streamlined permitting and the possibility of regulatory incentives, cross-border cost allocation and funding under the EU's Instrument for Pre-Accession Assistance and the Neighbourhood Investment Facility.

[11] These also apply to Italy and Poland. For more se MInisterial Decision (2015)

## *Table 10*
## *Current PECI projects*

| Electricity | Gas | Oil |
|---|---|---|
| — Transbalkan corridor:<br><br>1. (EM) 400 kV OHL Resita (Romania) - Pancevo (Serbia)<br><br>2. (EM) 400 kV OHL Kragujevac (Serbia) - Kraljevo (Serbia)<br><br>3. (EM) 400 kV OHL Obrenovac (Serbia) - Bajina Basta (Serbia)<br><br>4. (EIJ) 400 kV OHL (Bajina Basta (Serbia) - Visegrad (Bosnia and Hercegovina) - Pljevlja (Montenegro)<br><br>5. (El_3) Grid section in Montenegro — (EM3) Interconnection between Albania and former Yugoslav Republic of Macedonia: 400 kV OHL Bitola-Elbasan | 1. Serbia - Bulgaria Interconnector<br><br>2. Serbia - former Yugoslav Republic of Macedonia Interconnector<br><br>3. Albania - Kosovo Interconnector | 1. (Ukraine - Poland oil pipeline (Brody - Adamowo) |

*Source: Ministerial Concil, 2016.*

Also, some projects of common EU interest are relevant for the Balkan-Black Sea region. These include projects in

- Priority electricity corridor: Priority corridor North South electricity interconnections in Central Eastern and South Eastern Europe ('NSI East Electricity), which supports reinforcement of the interconnection between Bulgaria and Greece, reinforcement of the interconnection between Bulgaria and Romania and Black Sea Corriodor;[12]
- Three priority gas corridors: (i) : Priority corridor North-South gas interconnections in Central Eastern and South Eastern Europe ("NSI East Gas")[13] ; (ii) Corridor and/or LNG terminals in Greece through Greece, Bulgaria, Romania, Serbia and further (iii) Priority corridor Southern Gas Corridor ('SGC');
- Priority oil corridor: This includes several projects, such as JANAF- ADRIA project, as well Adamowo Brody Oil project. JANAF-ADRIA was prior to Croatia's accession to the EU considered as PECI project. It includes oil supply connections in Central Eastern Europe (JANAF- ADRIA). Planned is reconstruction, upgrading, maintenance and capacity increase of the existing JANAF and Adria pipelines linking the Croatian Omisalj seaport to the Southern Druzhba (Croatia, Hungary, Slovak Republic). Adamowo Brody Oil project is currently in permitting phase. It is 371 km pipeline connecting Brody (Ukraine) and Adamowo (Poland). Maximal technical capacity is 10, 20 and 30 million tonnes per year respectively, depending on the three consecutive stages of project implementation; and
- Two thematic areas: creating smart networks and constructing electricity highways;

Here we present more details on selected gas projects within priority corridor Southern Gas Corridor (SGC) which illustrate difficulties in harmonising regional, EU and interests of main suppliers.

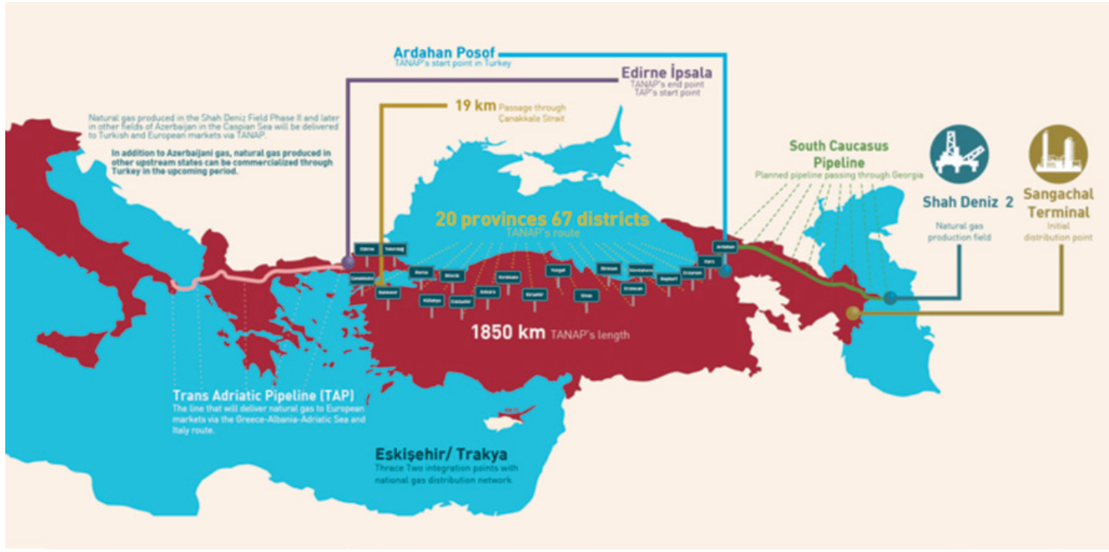
Southern gas corridor referrs to the various projects to bring gas to the EU from Azerbaijan.It includes a cluster of integrated, dedicated and scalable transport infrastructure and associated equipment for the transportation of a minimum of 10 bcm/a of new sources of gas from the Caspian Region, crossing Georgia and Turkey and ultimately reaching Italy through the Adriatic Sea.

The current list of potential projects includes:

- Trans Anatolian Natural Gas Pipeline (TANAP),
- Trans-Caspian Gas Pipeline (TCP) and
- Expansion of the South-Caucasus Pipeline (SCP-(F)X).

**TANAP** will bring gas fom Azerbaijan (and other possible neighboring countries) through Turkey to Europe.It is new onshore and offshore pipeline between the Eastern and Western borders of Turkey, crossing Anatolia with a length of 1900 km. Initial capacity is 16-billion-cubic meter yearly, about 6 billion cubic meters of which is expected to go to the Turkish market.Memorandum of Understanding was signed between the governments of Turkey and Azerbaijan in 2011: Planned date of commission is 2018. (See Picture 1)

## *Picture 1 - TAP, TANAP and SCP*




*Source: http://www.tanap.com/tanap-project/why-tanap/*

[12] "Black Sea Corridor" is known also as Cluster Bulgaria — Romania capacity. It includes reinforcement of the interconnection between Slovenia, Croatia and Hungary, reinforcements of the internal grid in Slovenia, as well as hydro-pumped storages in Bulgaria and Greece.

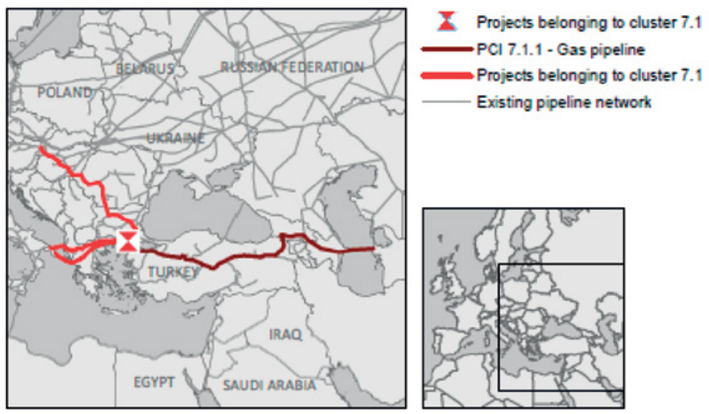
[13] It includes projects allowing bidirectional flows between Poland, Czech Republic, Slovakia and Hungary linking the LNG terminals in Poland and Croatia; projects allowing gas to flow from Croatian LNG terminal to neighbouring countries; projects allowing gas flows from the Southern Gas Corridor and/or LNG terminals in Greece through Greece, Bulgaria, Romania, Serbia and further to Hungary, including reverse flow capability from south to north and integration of transit and transmission systems; pojects allowing development of underground gas storage capacity in South- Eastern Europe

TCPit is off-shore pipeline in the Caspian Sea from Turkmenistan (tie-in to the East-West Pipeline or offshore collection points) to Azerbaijan (tie-in to the SCP-(F)X . It will be 300 km long with an ultimate capacity of 32 bcm a year. It is currently in pre-feasibility phase and is expected to be operational in 2019-2020.

## *Picture 2 - Trans-Caspian Gas pipeline*


*Source: https://en.wikipedia.org/wiki/Trans-Caspian_Gas_Pipeline#/media/File:Baku_pipelines.svg*

## *Picture 3 - TCP and the SCP-F(X)*




*Source: https://ec.europa.eu/energy/sites/ener/files/documents/pci_7_1_1_en.pdf*

**Expansion of the South Caucasus Pipeline (SCP (F)X)** is part of the Shah Deniz Full Field Development project. The South Caucasus Pipeline (SCP) was built to export Shah Deniz gas from Azerbaijan to Georgia and Turkey. It follows the route of the Baku-Tbilisi-Ceyhan (BTC)crude oil pipeline through Azerbaijan and Georgia to Turkey, where it is linked to the Turkish gas distribution system. SCP was constructed jointly with BTC in order to minimise the environmental and social impact and to achieve capital and operating cost savings. The pipeline has been operational since late 2006 transporting gas to Azerbaijan and Georgia, and starting from July 2007 to Turkey from Shah Deniz Stage 1.The length of the pipeline is 691km, with 443 km in Azerbaijan and 248 km in Georgia. The diameter is 42-inch The expansion involves the laying of new pipeline across Azerbaijan and the construction of two new compressor stations in Georgia with subsequent tie into TANAP, to provide gas into Turkey and the European Union. Expanison will triple the gas volumes exported through the pipeline to over 20 billion cubic metres per year.A Final Investment Decision on the South Caucasus Pipeline Expansion (SCPX) project was taken on 17 December 2013, coincident with Shah Deniz Stage 2. The list of projects of european interests is dynamic: previously Southern Gas Corridor included projects such as Nabucco, Nabuco West, and IAP. Nabucco was planned to supply of gas from the Caspian region to Europe and bypass Russia. The preparations began in 2002 for route running from Turkey (Erzurum) to Austria (Baumgarten an der March), via Bulgaria, Romania, Hungary (the pipeline length is approximately 3,300 km), with a maximum transport capacity of 31 billion m3 annually. The project has never gone very far from a technical standpoint, as there was no supplier. First Iran, Turkmenistan, Egypt and Iraq pulled out, and then Azerbaijan finally rejected the idea. In 2011 the pipeline had been reduced in 2011 in length to 1,300 km. The eastern section ( from Azerbaijan across Georgia and Turkey to the Bulgarian border) was abandoned. Nabucco-West, which was to have carried gas from from the Bulgarian/Turkish border via Bulgaria, Romania and Hungary to Austria was the only remaining part of the original project. Nabucco West lost out to the Trans Adriatic Pipeline in the 'Southern Corridor' contest to move Azeri gas to Europe from the second phase of the Shah Deniz project.

**The Trans-Adriatic Pipeline (TAP)** is contracted to carry 10 billion cubic metres of gas per year (bcm/y) to Europe. Connecting with the Trans Anatolian Pipeline (TANAP) at the Greek-Turkish border, TAP will cross Northern Greece, Albania and the Adriatic Sea before coming ashore in Southern Italy to connect to the Italian natural gas network. The project is currently in its construction phase, which started in 2016. TAP will be 878 kilometres in length (Greece 550 km; Albania 215 km; Adriatic Sea 105 km; Italy 8 km). The economic crisis, above all in Greece, could place the completion of the TAP project in doubt. When finalised, TAP would be a sign of growing geopolitical role of the TAP countries (Turkey, Greece, Albania).

The TANAP and TAP pipelines will reduce Europe's dependence on Russian supplies of gas. However, the capacity of 10 billion cubic metres of gas per year is only around one third of the amount Nabucco was to have carried. This equates to just 1 percent of Europe's total demand. The expansions (such as SCP F(X) ) are significant, but considerablly smaller than originally planned.

The increased independence of Turkey from Russian gas was one of the main goals of the southern route. Turkey is one of the largest importers of Russian gas, but at the same time is a key political partner of NATO and the EU in Eurasia and the Caspian region. The route will now not be built under the direction of the EU, but instead primarily under the control of Turkey and Azerbaijan. The laying of the TANAP and TAP pipelines will increase the geopolitical importance of these two countries as EU energy partners.

As regards **LNG Krk**, on the EU's list of projects of common intersets is the Cluster Krk LNG Regasification Vessel and evacuation pipelines

towards Hungary, Slovenia and Italy. It includesLNG Regasification vessel in Omišalj,Krk (HR), gas pipeline Zlobin –Bosiljevo –Sisak –Kozarac – Slobodnica (HR), LNG evacuation pipeline from Omišalj – to Jelšane (SI) or gas pipeline to Italy. THe Energy Community list includes LNG treminal and one of the pipelines which is also of the EU's interest: Zlobin –Bosiljevo –Sisak –Kozarac –Slobodnica.

**Adria (Janaf) pipeline** is considered as projects of common interest and the project of the Energy Community Interest (Europan Commission, 2013 ; Ministerial Council, 2013). It is based on increasing existing capacities of Janaf oil pipeline and connecting it to the Southern Druzhba. The Druzhba Adria Oil Pipeline would enable the export of Russian oil via Omišalj.

## *Picture 3 - Adria pipeline and location of LNG (Omišalj)*


*Source: https://commons.wikimedia.org/wiki/File:Druzhba.jpg*

## *Conclusions*

*Energy and development*
Emipirical research shows that (i) growth is positively affected by the stock of infrastructure assets, and (ii) income inequality declines with higher infrastructure quantity and quality (Calderón and Servé, 2004). Thus, construction of energy infrastructure in the region could foster development. However, to achieve such results, political, economic and technological preconditions have to be met.

Changes in list of projects of common interest show that postponing of investment decisons is closely linked with political and economic developments. Also, delays increase technical risks related to security of supply and thus necessary investments.

*Regional cooperation*
Individual countries of the region have limited impact on strategic decisions related to supply routes. Thus, coordination of negotiating positions within the region with respect to the main suppliers and markets is necessary to attract investors. Given the weak institutional capacities and political considerations, the development effects are more likely to be achieved by investments in national infrastructure than in regional. As a result, regional ownership, as exclusive possession or control of process is not likely to be reached. The reasons include regional and international considerations.

Regional reasons include lack of regional trust and ownership. Also, institutional framework is not stable. The Energy Community borders and members are changing: Bulgaria, Romania and Croatia left the Energy Community when joined the EU, while Ukraine and Molodova joined later. The benefits of the membership are not recognised in the region.[14]

Given the diversty of countries, lack of common organisational framework and weaknesses of decision making body of existing ones (Ministerial Council of the Energy Community), formulation of truly regional initiatives and promotion of regional interests is not very likely.

If TAP and TANAP are implemented, interests of project promotors (Turkey, Azerbeajan) and international financial insitutuions will persist in the region in the long-term. Without strong regional organisation, including relevant countries on their own initiative, participation in the Energy Community and PECI projects are likely to be seen as a form of international intervention, rather than a regional ownership.

Regional cooperation might have an impact on defining priorities and conditionality applied, but requires co-ordination of positions towards important regional issues. Capacity to formulate and implement truly regional interests is missing. Energy industries in Energy Community are not likely to create regional economic interest. Thus, Turkey, EU and global energy industries and financial institutions could have a significant role in formulating national energy policies and regional policies.[15] Such development makes it difficult to formulate regional ownership and coordinate national and regional policies. Policy coordination also requires strengthening of the process of policy formulation, primarily enhancing the role of parliaments. National parliaments should be involved in decision making on the regional level and formulation of criteria for the identification of strategic projects and critical infrastructure at national and regional levels, including the relevant requirements regarding environmental sustainability and public participation.

*Role of the EU and the Energy Community*

Given the institutional weaknesses that undermine creation of truly regional intitatives, the EU serves as a anchor for the development of economic relations and cooperation.Through the Energy Community, as the EU's external energy policy instrument, the EU tries to promote investment that would increase its energy security. With distant (or non-existant) membership perspective, the political motivation is not sufficient for alignment with the EU rules. Thus, the principle of conditionality is applied for financial support and access to finance. As a result, the parties of the Energy Community are interested in participating in the implementation of the Energy Strategy in order to meet EU conditionality and accordingly to be able to apply for funding. Energy Community has not developed in a tool for furthering regional cooperation and hence improving energy security. This explains lack of initative of the decision making institutions of the Energy Community (primarily the Ministerial Council). As the South East European countries generally do not have coherent medium-term strategy for reform, priorities are very much determined by short-term policy considerations, the process of integration into the European Union or deals with potential investors. This might foster competition instead of regional cooperation in concluding deals with main players (e.g. Turkey, Russia, EU or international financial institutions).

As a result, conflicting interests and economic and political instability might postpone investment decisions.

[14] E.g. integration of Ukraine and Moldova into the Energy Community entailed both costs and benefits for all parties, but they were asymetrical costs and benefits for the EU and Ukraine and Molodva. For more, see Petersen, 2012)
[15] As seen when Serbia struck an energy deal with Russia.

# *Annex. Energy Balances, Mtoe*

| Country | | Coal* | | | Crude oil* | | | Oil products | | | Natural gas | | | Nuclear | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2005 | 2010 | 2014 | 2005 | 2010 | 2014 | 2005 | 2010 | 2014 | 2005 | 2010 | 2014 | 2005 | 2010 |
| Albania | production | 11 | 2 | 0 | 418 | 744 | 1368 | 0 | 0 | 0 | 9 | 12 | 25 | 0 | 0 |
| | TPES | 13 | 111 | 86 | 418 | 156 | 361 | 1001 | 1065 | 962 | 9 | 12 | 25 | 0 | 0 |
| Bosnia and Herzegovina | production | 2947 | 3501 | 3768 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TPES | 3030 | 4030 | 4440 | 149 | 1160 | 1028 | 980 | 551 | 446 | 302 | 199 | 151 | 0 | 0 |
| Bulgaria | production | 4176 | 4940 | 5120 | 29 | 22 | 25 | 0 | 0 | 0 | 384 | 59 | 159 | 4875 | 3997 |
| | TPES | 6915 | 6904 | 6393 | 6612 | 6125 | 6189 | -1812 | -2251 | -2228 | 2803 | 2300 | 2362 | 4875 | 3997 |
| Croatia | production | 0 | 0 | 0 | 1034 | 765 | 610 | 0 | 0 | 0 | 1865 | 2214 | 1443 | 0 | 0 |
| | TPES | 59 | 683 | 647 | 5436 | 4449 | 3010 | -981 | -789 | 12 | 2369 | 2639 | 2019 | 0 | 0 |
| Greece | production | 8538 | 7315 | 638 | 92 | 105 | 58 | 0 | 0 | 0 | 18 | 8 | 5 | 0 | 0 |
| | TPES | 8952 | 7863 | 6687 | 20001 | 20655 | 25578 | -3050 | -6802 | -14840 | 2353 | 3234 | 2484 | 0 | 0 |
| Romania | production | 5795 | 5904 | 4449 | 5899 | 4186 | 3961 | 0 | 0 | 0 | 9699 | 8616 | 8763 | 1448 | 3029 |
| | TPES | 8757 | 6954 | 5710 | 14582 | 10246 | 10896 | -4886 | -1681 | -2903 | 13919 | 10785 | 9362 | 1448 | 3029 |
| Serbia | production | 7461 | 7229 | 5713 | 663 | 942 | 1217 | 0 | 0 | 0 | 228 | 308 | 444 | 0 | 0 |
| | TPES | 8072 | 7827 | 6249 | 3800 | 3068 | 3142 | 581 | 825 | 121 | 1946 | 1853 | 1608 | 0 | 0 |
| Turkey | production | 10806 | 17524 | 16202 | 2231 | 2650 | 2610 | 0 | 0 | 0 | 738 | 562 | 394 | 0 | 0 |
| | TPES | 22626 | 32172 | 35879 | 25605 | 20853 | 20701 | 3140 | 10652 | 12098 | 22785 | 31386 | 40193 | 0 | 0 |
| Kosovo | production | 1221 | 1612 | 1342 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TPES | 1242 | 1675 | 1355 | 0 | 0 | 0 | 455 | 530 | 548 | 0 | 0 | 0 | 0 | 0 |
| Macedonia | production | 1229 | 1194 | 985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TPES | 1399 | 1303 | 1079 | 968 | 875 | 0 | -59 | 64 | 889 | 63 | 69 | 111 | 0 | 0 |
| Montenegro | production | 287 | 426 | 364 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TPES | 281 | 411 | 359 | 0 | 0 | 0 | 275 | 301 | 260 | 0 | 0 | 0 | 0 | 0 |

## *Institute for Development and International Relations*

The fundamental mission of the **Institute for Development and International Relations** is developing and disseminating theoretical, methodological and technical knowledge and skills required for scientific and professional interpretation and evaluation of contemporary international relations which affect various human activities and related developmental trends important for the Republic of Croatia. Development tendencies are observed in the local, regional, European and global context.

In its scientific and professional work the Institute focuses on various forms of interconnections between international relations and political, economic and socio cultural development tendencies. Fifty years of scientific work of the Institute for Development and International Relations reflects various development dynamics and fluctuating international connections worldwide. The Institute's research often preceded changes in the environment in which it operated. Most research programs were, and still are, characterized by interdisciplinarity and research flexibility.

## *New Strategy Center*

**New Strategy Center (NSC)** is a Romanian think tank, non-governmental organization, designed to provide a debating framework on topics of major interest for Romania. NSC submits relevant topics both in terms of threats to national security, and opportunities for economic development of the country to the general consideration and debate. The Balkans and the Black Sea are the main points of interest for NSC, a large and complementary area with a significant impact on Romanian security. The defense, the connection between the military modernization and industrial development, the energy security, the technological development, the challenges of the hybrid threats, the public diplomacy and the cyber security are some of other issues on which NSC is focused on.

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