Energy Community

Electricity

Analysis of Direct and Selected Indirect Subsidies to Coal Electricity Production in the Energy Community Contracting Parties

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Abbreviations

AERS – Energy Agency of the Republic of Serbia

EnC – Energy Community

ERO – Energy Regulatory Office of Kosovo*

ERC – Energy Regulatory Commission of North Macedonia

ERS - Elektroprivreda RS

EPBIH – Elektroprivreda BiH

EU – European Union

EUROSTAT - Statistical office of the European Union

GIG – Georgian Industrial Group

IEA – International Energy Agency

LCPD – Large Combustion Plants Directive

MERA – Montenegro Energy Regulatory Agency

NCSREPU – Ukraine National Commission for the State Regulation in the Sector of Energy and Public Utilities Sector

NECP – National Energy and Climate Plan

NERP - National Emission Reduction Plan

OECD – Organization for Economic Cooperation and Development

SOE – State-Owned Enterprise

SERC - State Electricity Regulatory Commission of the Bosnia and Herzegovina

VAT – Value Added Tax

WTO – World Trade Organization

Foreword

On 1 January 2016, seventeen Sustainable Development Goals of the 2030 Agenda for Sustainable Development, adopted by world leaders in September 2015 at a historic UN Summit, officially came into force.[1]

Out of the seventeen goals, goal seven refers to energy explicitly (ensure access to affordable, reliable, sustainable and modern energy) and goal twelve implicitly (ensure sustainable consumption and production patterns). Sustainable production and consumption focuses on water, energy and food.

Within goal twelve, eight targets are defined, including the target to "by 2030 ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature".

It is further elaborated as the commitment to "**rationalize inefficient fossil fuel subsidies that encourage wasteful consumption** by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities".

This analysis is intended to shed more light on the direct and indirect state support to coal mining and use of coal for generation of electricity, the resulting market distortions, consumption patterns and long-term viability of systems relying on coal-fired power production in selected Energy Community Contracting Parties.

[1] https://www.un.org/sustainabledevelopment/development-agenda/.

1 EXECUTIVE SUMMARY

Subsidies allow coal electricity producers to supply electricity to the market at prices that are below the real cost or at prices that allow producers to minimise their losses or generate profits by receiving subsidies. These subsidized producers find themselves in a privileged position relative to other suppliers and this situation becomes a textbook case of unfair competition in the electricity markets. Vast efforts and financial resources are used to support the continuation of an unsustainable energy policy.

The Energy Community Contracting Parties have legal obligations regarding the prohibition of state aid that distorts or threatens to distort competition[2], which must be respected. State aid authorities in the Contracting Parties systematically turn a blind eye to this issue.

As things stand, addressing this elephant in the room, chiefly related to the grave difficulties in the operation and economics of the coal sector in some Contracting Parties, has been postponed for decades by the provision of subsidies, with the objective to avoid or postpone facing the economic and social problems that would ensue.

Subsidization of the coal sector and coal-based production distorts the electricity markets, sending wrong signals to potential investors and consumers alike.

In the Contracting Parties where coal-based production is prevailing or significant, a frequent motivation for subsidization is the government's intention to maintain low electricity prices for the final customer, in order to avoid potential economic, social or political problems that may arise if such subsidies were abolished. Moreover, subsidized electricity retail prices are misleading consumers as they do not encourage the uptake of energy efficiency measures.

On the other hand, the entities that are regularly subsidized have no incentive to improve their own operation, to cut costs or operate on market principles; instead, they rely on political support and regular assistance through various subsidization mechanisms, thereby becoming a permanent burden for governments and public finances.

The Contracting Parties of the Energy Community face the challenging task of meeting the obligations that arise from the EU directives on environment as well as those assumed through the Paris Agreement.

In their long-term energy sector development strategies, the Contracting Parties with significant share of electricity generated from coal envisage the modernization and environmental rehabilitation of almost all available capacities, as well as construction of replacement capacities. This would require vast financial resources and the organization of an efficient, market-oriented and profitable system of electricity generation from coal.

Due to the subsidization of coal, the Energy Community Contracting Parties are not prepared to follow the EU in its decarbonisation pathway. After neglecting the decarbonisation imperative on regional and national levels for years, the reform efforts in an already difficult social-economic environment would have to be increased considerably.

[2] Treaty establishing Energy Community, Article 18 https://www.energy-community.org/legal/treaty.html, Accessed on 10.07.2018.

At a time when the EU strives to achieve net-zero greenhouse gas emissions by 2050, coal still represents 97% of electricity generation in Kosovo*, 70% in Serbia and Bosnia and Herzegovina, more than half in North Macedonia, around half in Montenegro and 28% in Ukraine.

The study shows that existing subsidization policies and measures have a significant impact on the cost of coal-fired electricity generation, and thereby on the selling price of electricity, both in the domestic and foreign markets. Selling electricity below actual cost causes market distortions, undermines the principles of fair market competition and sends wrong signals to investors and buyers of electricity.

The study's findings show that direct and indirect subsidies for coal electricity generation in the Contracting Parties constitute a serious obstacle to the establishment of a fair, transparent and open electricity market, both within individual Contracting Parties and at a regional level.

Unlike in the EU, CO2 emissions are not factored into the Energy Community Contracting Parties' electricity price. Currently, the price of a ton of CO2 emissions in the EU is around EUR 20. Coal power plants in the Western Balkans produce around 45 million tons of CO2 annually (half of it in Serbia) and in Ukraine an additional 46 million tons.

If emitters would purchase CO2 allowances like in the neighbouring EU, Western Balkan countries would collect EUR 1 billion annually and Ukraine an additional EUR 1 billion by itself. As in the EU, this money could be used to support the clean energy transition and those who will be most affected by it.

This hidden subsidy also leads to dumping through the export of low-priced electricity to the EU's internal energy market, an issue bound to raise serious concerns in the affected EU Member States.

On top of the absence of any internalisation of the damage done to health, environment and climate, direct subsidies for coal are also growing rapidly. In 2015-2017 alone, Serbia, Bosnia and Herzegovina and Kosovo* paid more than EUR 160 million to the coal sector from the state budget and public social funds in order to keep a fragile social peace.

If the Energy Community Contracting Parties where coal is the dominant source of energy would become EU Member States and would thus have to respect the Emission Trading Scheme Directive, all coal-based electricity generation incumbents would go bankrupt at once.

In the period analysed (2015-2017), average annual direct subsidies amounted to EUR 414 million. If coal-based electricity producers would pay 20 EUR per ton of emitted CO2 in 2017 as in the EU, these companies would pay into the state budgets an additional EUR 1750 million.

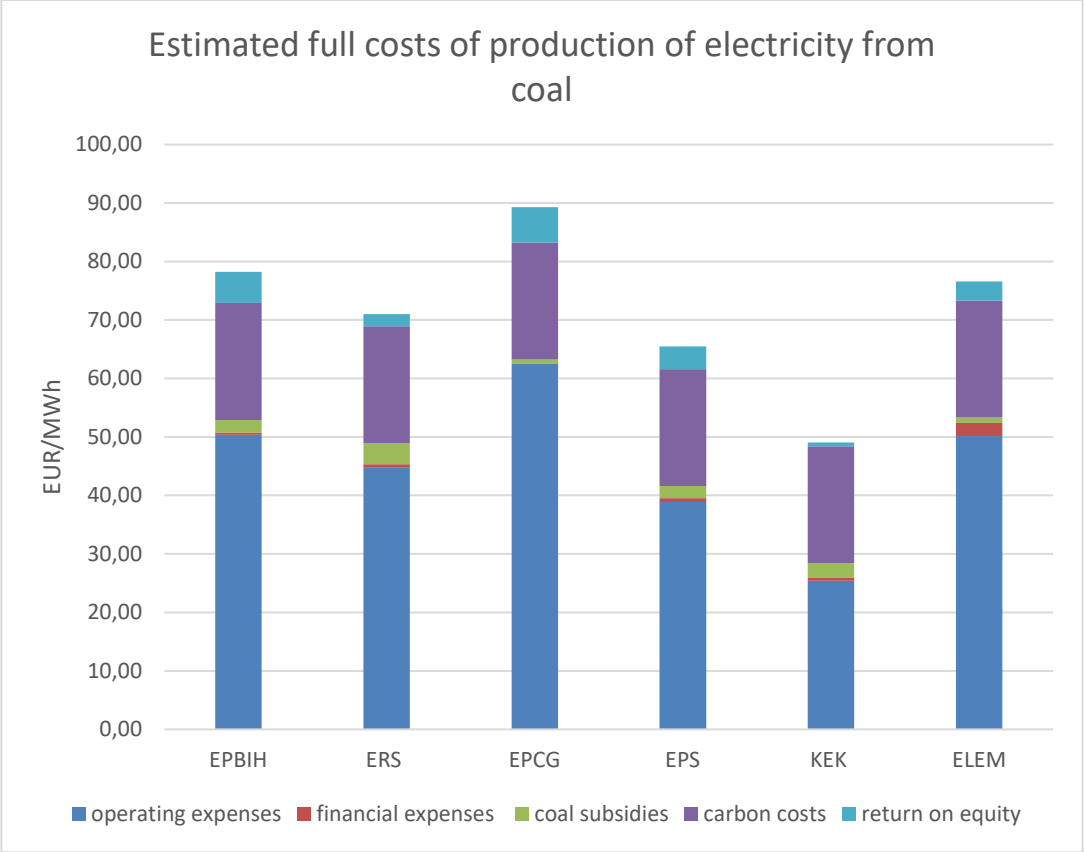
If the state-owned producers of electricity from coal would reach a profit that would be comparable at least with a low rate of return on state bonds (3%), they could invest or pay into the state budgets at least EUR 142 million in 2017 (without Ukraine).

Without direct and two types of hidden subsidies analysed in this study and without cross-subsidisation between households and industry, the price of electricity for households would have to be increased by some 29% in North Macedonia, 23% in Kosovo, 31% in Bosnia and Herzegovina, 37% in Montenegro and 49 % in Serbia. Prices for industrial consumers would have to be increased by 34% in North Macedonia, 30% in Bosnia and Herzegovina, 18% in Serbia and 36% in Montenegro, while in Kosovo* it would be decreased by 9%.

The impact on only energy component of final price for household consumers would be in that case 47% in Kosovo*, 53 in North Macedonia, 78% in Bosnia and Herzegovina, 97% in Montenegro and 140 % in Serbia. Energy component in prices for industrial consumers would have to be in such case increased by 36% in Serbia, 46% in North Macedonia, 53% in Bosnia and Herzegovina, 80% in Montenegro, , while in Kosovo* it would be decreased by 13%.

The increase on average electricity prices in Ukraine would exceed 30%.

If all direct and indirect subsidies were eliminated and all costs associated with power production in mainly state-owned generation plants were recognized, the unit costs of production of electricity in the existing coal-fired generation fleet, based on conservative estimates, are in the range of 50 to 90 EUR/MWh:



GRAPH 1 – THE COSTS COMPONENT OF GENERATION PRICE OF ELECTRICITY FROM COAL FIRED PLANTS OF INCUMBENT PRODUCERS IN THE ENERGY COMMUNITY[3]

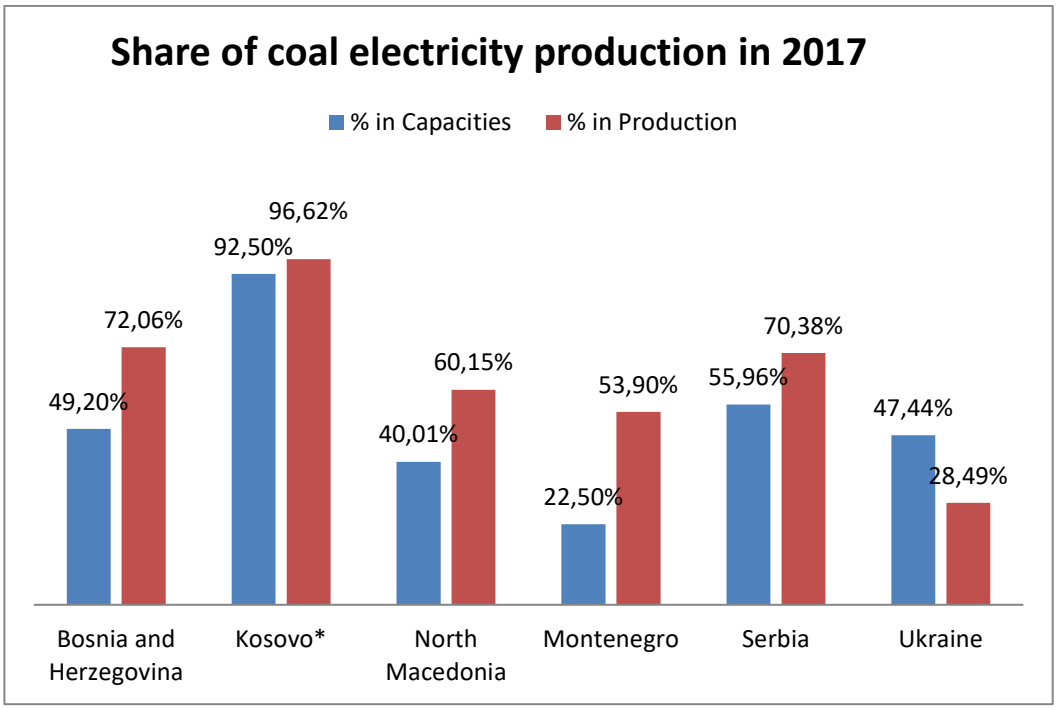
This study did not take into account the additional challenge which all analysed countries face because of the Large Combustion Plants Directive. Since all opted-out power plants are allowed to operate for a maximum of 20.000 hours in the period 2018-2023, they have to accelerate their depreciation, which will substantially increase their costs in the next few years.

[3] Data for Ukraine was in many instances not available to the authors at the time of publication of this study. The aim is that the missing data will be added following the public consultation in order to be included in the final version of the study.

2 INTRODUCTION AND BACKGROUND

Harmonization of energy and climate policies, as part of the obligations stemming from the Paris Agreement[4], is a major focus for the European Union. In its strategic planning documents[5], the EU emerges as a guiding force in the process of decarbonisation of energy production by 2050. The transition towards a net-zero greenhouse gas economy gives the energy sector – the largest emitter - a central role to play in meeting the targets set in the Paris Agreement and reducing the future cumulative emissions of carbon dioxide (CO2). To achieve the EU targets[6], it is imperative to decarbonise national economies. This entails a set of policies that will lead to a radical transformation of the structural, technological and ultimately societal systems.

The capacities for electricity generation from coal account for over 46% of the total installed electricity generation capacities in the Energy Community. The share of electricity from coal exceeds 39% of the total electric power output in the Energy Community.



GRAPH 2 - COAL IN THE FUEL MIX FOR GENERATION OF ELECTRICITY

In the light of meeting the commitments made under the Energy Community Treaty, the EU Directives on emissions of harmful gases and the obligations arising from the Paris Declaration

[4] The text of the Paris Agreement is available at: unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf, Accessed on 04.08.2018.

[5] A Clean Planet for all - A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf, Accessed on 21.12.2018.

[6] The current proposed EU goals by 2030 are: 32% share of renewable energy in final consumption (corresponding to 45-55% share in electrical power consumption), a reduction in greenhouse gas emissions by 40% (relative to 1990) and an increase in energy efficiency of 32,5% relative to business as usual - BaU scenario.

on Decarbonisation, this sector of the electricity generation requires additional attention and new efforts to ensure the undertaken obligations and set goals can be met.

All Contracting Parties (with the exception of Kosovo*[7]) are signatories to the Paris Agreement and have undertaken additional commitments to reduce greenhouse gas emissions, strive for a cleaner environment and create the right conditions for climate-resilient development. The Paris Agreement requires Contracting Parties to review their existing energy policies, harmonize them with the signed obligations and redirect funds to achieve the Agreement's abatement goals.

The Contracting Parties of the Energy Community have committed to meet the targets and obligations arising from the Energy Community *acquis.* In accordance with the General Policy Guidelines on 2030 Targets for the Contracting Parties of the Energy Community[8], in the course of 2019, energy and climate targets for 2030 should be defined and the European Commission will propose to the Contracting Parties the inclusion of legislation stemming from the 'Clean Energy for all Europeans' package in the Energy Community *acquis*, namely the recast Renewable Energy Directive, Energy Efficiency Directive and the Governance Regulation. Also, following Recommendation 2018/01/MC-EnC on preparing for the development of integrated National Energy and Climate Plans (NECPs), it is envisaged that NECPs are prepared and submitted to the Energy Community Secretariat by 2020.

In addition, the year 2018 represented a turning point for the Contracting Parties, since the implementation phase of Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (LCPD, for existing plants) and Directive 2010/75/EU on industrial emissions (IED, for new plants) [9], which regulate the emissions of large combustion plants in the Energy Community, have both started on 1 January 2018. This means that existing fossil fuel-fired power plants have to reduce their sulphur dioxide, nitrogen oxide and dust emissions significantly to meet the standards of the LCPD, while new ones must comply with more stringent standards of the IED, which can often only be done at the cost of non-compliant state aid distorting the markets. Thereafter, coal has become a highly problematic natural resource[10].

The scale of the efforts facing the Energy Community Contracting Parties is best evident from the data below on the number of plants that fall within the scope of this directive.

Contracting Party	Number of plants covered under LCPD	Coal units	Installed capacity of coal units in MW
Albania	0	0	0
Bosnia and Herzegovina	13	10	2.156
Georgia	4	0	0

[7] 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.
[8] The Policy Guidelines by the Energy Community Secretariat on the development of National Energy and Climate Plans under Recommendation 2018/01/MC-EnC. file:///C:/Users/User/Downloads/PC_03_2018_ECS_NECP.pdf, Downloaded on 15.10.2018.
[9] https://www.energy-community.org/legal/acquis.html, see under Environment, Accessed on 14.08.2018.
[10] Energy Community Secretariat, June 2018, *The Wachau Manifesto*.

Kosovo*	5	5	960
North Macedonia	8	4	825
Moldova	2	0	0
Montenegro	1	1	219
Serbia	17	15	4.386
Ukraine	147	97	24,565
TOTAL	197	132	33.111

TABLE 1 - PLANTS COVERED BY THE LARGE COMBUSTION PLANTS DIRECTIVE[11]

This situation requires the Contracting Parties to review their current measures in the coal electricity generation sector and re-examine policies to ensure gradual compliance with the LCPD and IED, while meeting state aid and competition requirements. In the long-term, this shall lead to the sustainable phasing out of coal, taking care to address the possible negative economic and social impacts.

Energy Community Contracting Parties, especially EU accession countries, will in the foreseeable future have to impose carbon pricing and transpose also Emission Trading Scheme Directive. Such a step will equalise market conditions on a European single internal energy market. Current existence of two legal regimes on the same market in relation to carbon pricing was tolerable when prices of CO2 allowances on EU market were low. With current price 20 EUR/ton or more the difference becomes very visible and calls for reciprocity. Its existence is not only bringing distortion on the single European market but is by leaving Energy Community Contracting Parties in a carbonisation environment also pushing them away from the integration path.

The main objectives of the study are: to estimate the real price of electricity generated by coal - fired thermal power plants in the Energy Community Contracting Parties and to improve the understanding of national policies and level of direct and indirect subsidies for coal-based electricity generation.

Covering the period 2015-2017, the study focuses on those Contracting Parties where coal-fired electricity generation is present: Bosnia and Herzegovina, Montenegro, Kosovo*, North Macedonia, Serbia and Ukraine. Albania, Moldova and Georgia presently lack coal-fired electricity generation capacity, and consequently have no direct subsidies for this type of production. In the foreseeable future, Albania and Moldova have no plans to build coal-fired electricity generation plants.

The situation is somewhat different in Georgia. According to available information, there are plans for the construction of a coal-fired thermal power plant with installed capacity of up to 300 MW in Georgia. Pursuant to the memorandum signed with the Government of Georgia, the investor, CPower, a member of the Georgian holding company Georgian Industrial Group, signed a power purchase agreement with the Georgian Electricity Market Operator (ESCO) in March 2017. In November 2017,

[11] Source: Annual Implementation Report, Energy Community Secretariat, 2018; Study on the Need for Modernization of Large Combustion Plants in the Energy Community, SEEC Ltd, 2013 https://byt.cevre.gov.tr/Pictures/Files/Editor/document/Other%20Useful%20Documents/Need%20for%20modernisation%20of%20LCPs%20in%20Energy%20Community.pdf, Downloaded on 18.11.2018.

CPower and the Chinese company Dongfang Electric Corporation signed a contract to build and supply equipment for a thermal power plant with installed capacity of 300 MW to be constructed at Gardabani, using coal from the mines owned by the Georgian Industrial Group (GIG). This contract is valued at USD 200 million, and the total value of the planned investment is USD 250 million. The construction was planned to start in 2018, and the thermal power plant was supposed to come onstream in the last quarter of 2020. After the July 2018 accident in the Mindeli Mine operated by Sakhnakhshiri Co., which is owned by GIG, in which 4 miners were killed and 6 others injured, GIG announced that it intended to transfer the ownership of its Sakhnakhshiri Co. to the state. At this time, it remains unclear how this development will impact the construction of the planned coal-fired thermal power plant.[12]

[12] See more: http://www.gig.ge/?lang=en&newsid=262, Accessed on 07.07.2018 and http://www.gig.ge/?newsid=361, Downloaded 01.08.2018

3 DIRECT SUBSIDIES

This study outlines the key findings of an analysis which identifies and quantifies direct and two types of indirect subsidies for electricity generation from coal in the Contracting Parties of the Energy Community. The study covers the six Contracting Parties that own and utilize capacities and resources for this type of energy production: Bosnia and Herzegovina, Kosovo*, North Macedonia, Montenegro, Serbia and Ukraine.

The study covers the period 2015-2017; all data gathered and presented in this study are based on information collected from public sources.

The World Trade Organization's (WTO) definition of subsidies was used as the basis for conducting research, identifying, calculating and describing the direct subsidies, which were classified into three categories:

- fiscal support-type subsidies;
- public finance support subsidies; and
- State Owned Enterprises (SOE) investment support subsidies.

WTO defines a subsidy as "any financial contribution by a government, or an agent of a government, that confers a benefit on its recipients"[13].
Fiscal support-type subsidies are directly linked to the state budget and take the form of direct budget transfers, deferred or reduced budget revenues or write-offs of arrears to the budget. This category of subsidies is most often associated with direct subsidies.
Public finance support subsidies are not directly associated with the government budget, but constitute support provided to beneficiaries by institutions under control of governments or international financial institutions that take the form of state guarantees, loans and grants provided by such entities.
SOE investment support subsidies constitute assorted types of support extended by majority State-Owned Enterprises to beneficiaries in the coal-fired electricity generation sector in excess of market-oriented and economically rational behaviour and criteria, and take the form of equity investment, loans, advances, or forgiveness of arrears.

The study revealed that, during 2015-2017, subsidies for electricity generation from coal were provided in all observed Contracting Parties. **The total sum of direct subsidies during this period exceeded EUR 1,2 billion.** The total amount of direct subsidies per Contracting Party is shown in the table below:

			in EUR million	
Contracting Party	**2015**	**2016**	**2017**	**Total 2015-2017**
Bosnia and Herzegovina	26,01	42,86	55,76	124,64
Kosovo*	38,12	15,23	13,42	66,77
North Macedonia	4,38	3,72	2,93	11,03
Montenegro	0,88	1,16	0,85	2,88
Serbia	95,48	119,50	84,37	299,35
Ukraine	194,73	263,4	280,44	738,57
TOTAL	**359,61**	**445,87**	**437,76**	**1.243,24**

TABLE 2 – TOTAL DIRECT SUBSIDIES PROVIDED TO COAL ELECTRICITY PRODUCERS BY CONTRACTING PARTY

Source: Based on calculations in Annexes

The impact of direct subsidies on coal-fired electricity generation costs, and consequently on the real costs of generated electricity (covering total production costs and ensuring an adequate profit margin), is best determined based on level of subsidies calculated per 1 MWh of produced

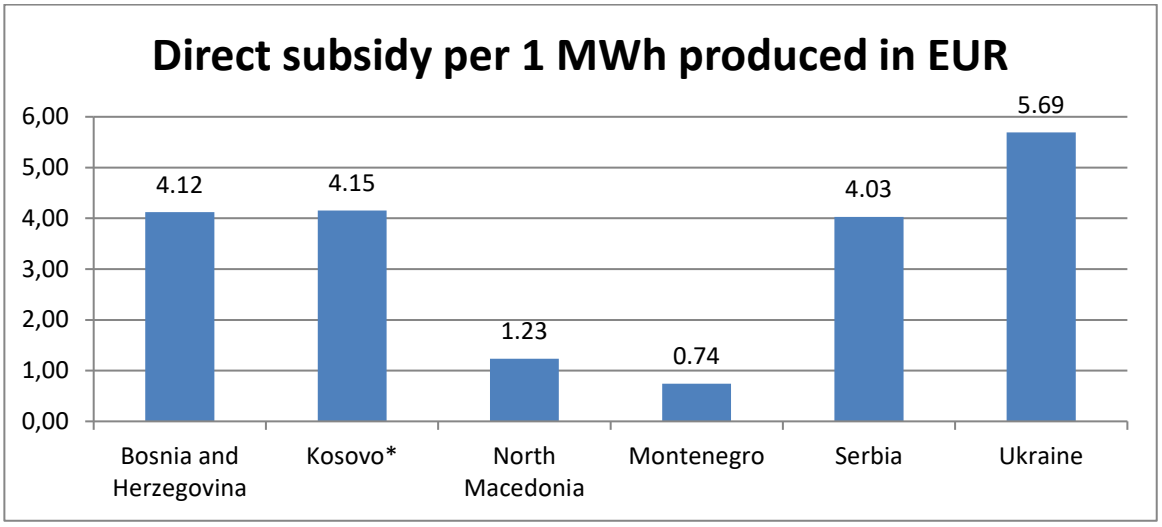
[13] https://www.wto.org/english/docs_e/legal_e/24-scm.pdf, Downloaded on 20.06.2018.

energy (average annual amount of subsidies divided with the average annual output) during the given period.

Contracting Party	Total average annual subsidy support (2015- 2017), in EUR million	Average annual electricity production from coal (2015-2017), in MWh	Subsidy per 1 MWh produced, in EUR
Bosnia and Herzegovina	41,55	10.079.000	4,12
Kosovo*	22,26	5.361.000	4,15
North Macedonia	3,68	2.979.000	1,23
Montenegro	0,96	1.298.000	0,74
Serbia	99,78	24.757.000	4,03
Ukraine	246,19	43.296.000	5,69
TOTAL	**414,41**	**87.770.000**	**4,72**

TABLE 3 - AVERAGE ANNUAL DIRECT SUBSIDY PER 1 MWH PRODUCED

Source: Based on calculations in Annexes



GRAPH 3 - DIRECT SUBSIDIES TO COAL BASED POWER GENERATION

As opposed to the subsidy levels in absolute terms, whereby subsidization is highest in Ukraine and Serbia, the above analysis reveals that the per unit direct subsidies for coal-fired electricity generation are highest in Ukraine, Kosovo* and Bosnia and Herzegovina.

The following table shows the share of direct subsidies as a percentage of GDP and general government expenditures for Contracting Parties covered by the study.

Contracting Party	GDP average 2015 - 2017[14]	General government expenditures average 2015-2017[15]	Estimated direct subsidies average 2015-2017	Share of estimated direct subsidies in GDP	Share of Estimated direct subsidies in general government expenditures
	Mill. EUR	**Mill. EUR**	**Mill. EUR**	**%**	%
Bosnia and Herzegovina	15290	6436	41,55	0,27%	0,65%
Kosovo*	6095	1664	22,26	0,37%	1,34%

[14] World Bank national accounts data.https://data.worldbank.org/indicator/NY.GDP.MKTP.CD, Accessed on 29.12.2018.

[15] International Monetary Fund, World Economic Outlook Database https://www.imf.org/external/pubs/ft/weo/2018/02/weodata/index.aspx, Accessed on 29.12.2018.

North Macedonia	9566	3042	3,68	0,04%	0,12%
Montenegro	3964	1870	0,96	0,02%	0,05%
Serbia	34923	15450	99,78	0,29%	0,65%
Ukraine	88555	36920	246,19	0,28%	0,67%

TABLE 4 - SHARE OF DIRECT SUBSIDIES AS A PERCENTAGE OF GDP AND GENERAL GOVERNMENT EXPENDITURES BY CONTRACTING PARTY

Scope of work and methodology used to estimate direct subsidies

The study was conducted following an agreed-upon methodology. The analysis covers:

- Examination of the structure of the electricity generation sectors of the Contracting Parties and identified coal -fired electricity generation Contracting Parties and producers;
- Review and evaluation of existing studies, databases, assessments and calculations relevant for the purpose of the study;
- Identification and calculation of coal electricity production-related direct subsidies in the Contracting Parties and their classification into fiscal support, public finance support or investment support by state-owned enterprises.

There are many definitions and methodologies that apply to subsidies, as well as many different classifications of subsidies. At the national level, defining subsidies is chiefly a matter of policy that reflects the prevailing political, economic and legal conditions and frequently does not correspond to reality. Due to differences in defining, tracking and recording subsidies, a complete understanding of the system and scope of subsidization in a given Contracting Party is possible only through comparison with internationally accepted definitions and categorization of subsidies.

At the international level, a number of organizations have developed definitions which (despite certain differences) largely reflect the essential elements of a subsidy as accepted in economic theory. The major international organizations that have contributed to the development of a workable definition include the Organization for Economic Co-operation and Development (OECD), World Trade Organization (WTO), European Union (EU), International Energy Agency (IEA), World Bank Group, International Monetary Fund (IMF) and the International Institute for Sustainable Development's Global Subsidies Initiative (IISD-GSI).[16]

The simplest definition of a subsidy is a direct budgetary payment (also called "direct budget expenditure") by a government to a producer or consumer.[17]

The EU use the term "state aid" instead of subsidy. The term "state aid", according to EU law, refers to forms of assistance from a public body or publicly funded body given to undertakings/enterprises engaged in economic commercial activity on a selective basis, with the potential to distort competition. Article 87(1) of the European Community Treaty[18] defines state aid as "…any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market..."

[16] See more: Analysing energy subsisdies in the countries of Eastern Europe, Caucasus and Central Asia, OECD, 2013 http://www.oecd.org/env/outreach/energy_subsidies.pdf, Downloaded on 22.06.2018.
[17] Ibidem.
[18] Treaty establishing the European Community (Consolidated version 2002) https://eur-lex.europa.eu/eli/treaty/tec_2002/oj, Accessed 19.12.2018.

There is no globally agreed definition of what constitutes a subsidy. The WTO, however, takes a broad approach and defines a subsidy as 'any financial contribution by a government, or agent of a government, that confers a benefit on its recipients' (WTO, 1994).[19]

This research is based on the definition of subsidies provided by the WTO Agreement on Subsidies and Countervailing Measures (WTO 1994)[20]:

Article 1, Definition of a Subsidy

> *For the purpose of this Agreement, a subsidy shall be deemed to exist if: (a) (1) there is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as "government"), i.e. where:*
> *(i) a government practice involves a direct transfer of funds (e.g. grants, loans and equity infusion), potential direct transfers of funds or liabilities (e.g. loan guarantees);*
> *(ii) a government revenue, that is otherwise due, is forgone or not collected (e.g. fiscal incentives, such as tax credits);*
> *(iii) a government provides goods or services other than general infrastructure, or purchases of goods;*
> *(iv) a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments; or*
> *(a) (2) there is any form of income or price support in the sense of Article XVI of the General Agreement on Tariffs and Trade (GATT) 1994[21]; and*
> *(b) a benefit is thereby conferred.*

It is important to note that the WTO definition of subsidies rests on two fundamental elements. One, that a government or any other public body in the Contracting Party is providing a financial contribution. Two, that this contribution provides a benefit to the recipient. What matters is not what categories or groups the subsidies fall in, but that they target precisely defined entities/sectors or products/services that benefit from such measures. In this context, the WTO methodology does not recognize the classification into direct or indirect subsidies, but instead it focuses on the calculation of the scale of the benefits generated by subsidies which at the same time presents costs for the government.

According to OECD[22], direct subsidies are generally provided in the form of targeted (financial) transactions, such as loans and tax preferences. Beneficiaries receive indirect subsidies through higher prices for their outputs and/or through lower costs for their inputs or services they use.

It follows that a single clear and generally accepted definition of direct subsidies does not exist.

For the purpose of this study, all subsidies with a defined monetary value that may be tracked to a specific final beneficiary, while providing a direct benefit, will be considered as direct subsidies.

In order to better understand national policies and instruments that governments use to subsidize electricity generation from coal, the collected data and information are aggregated to show the amount of direct subsidies derived from all types of support.

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[19] https://www.wto.org/english/docs_e/legal_e/24-scm.pdf, Downloaded on 20.06.2018.

[20] https://www.wto.org/english/docs_e/legal_e/24-scm.pdf, Downloaded on 20.06.2018.

[21] *GATT is a multilateral agreement regulating international trade. According to its preamble, its purpose is the "substantial reduction of tariffs and other trade barriers and the elimination of preferences, on a reciprocal and mutually advantageous basis." GATT was signed in 1947 and lasted until 1993. It was replaced by the WTO in 1995. The original GATT text (1947) is still in effect under the WTO framework, subject to the GATT 1994 modifications.*

[22] Analysing energy subsisdies in the countries of Eastern Europe, Caucasus and Central Asia, OECD, 2013 http://www.oecd.org/env/outreach/energy_subsidies.pdf, Downloaded on 22.06.2018.

To obtain a comprehensive insight into the subsidy levels, when the amounts of direct subsidies were calculated, in some cases it was necessary to depart from the WTO methodology for calculation of subsidies. The reason being - pursuant to Annex IV of the WTO Treaty[23]- that the calculation of the amount of subsidy is treated solely in terms of the cost to the subsidizing government.

As in some cases the costs to governments are lower than the level of benefits obtained by subsidy recipients[24], a better understanding of the impact of subsidies on the electricity generation from coal is attained when the amount of the subsidy is calculated as benefit to the beneficiary in those cases when the benefit to the beneficiary is greater than the cost to the government.

Based on the WTO definition of subsidies, this report divides support and subsidies to coal electricity production into three main categories[25]: fiscal support; public finance support; and SOE investment support.

3.1 Fiscal support

Fiscal support is defined as any direct government spending from the budget, tax breaks and income or price support or any government revenue forgone, deferred or not collected and could be divided in two categories:

a) Direct budget transfers for any purpose to coal mines supplying thermal power plants or for companies involved in coal-fired electricity generation including direct budgetary expenditures and government loans;
b) Forgone revenues, including arrears for taxes, contributions or other public revenues connected with entities involved in coal-fired electricity generation, debt write-offs, and exemptions from payment of costs or reduction of liabilities for such costs, and lower tax rates or other fiscal charges relative to other entities.

The above listed types of support and direct subsidies are categorized under 'fiscal support' because they directly impact the budget, either as a direct budget outlay or as forgone or deferred budget revenue.

The data for direct transfers from the budget is shown as the amounts transferred in the year the transactions were completed. The data for government loans is shown as outstanding debt as of year-end. The data for debt for public revenues is shown as the end-year outstanding balance. The reason is that the failure to collect such claims results in lower budget revenues for the given year.

Other data in this category were calculated and estimated on the basis of government decisions to grant the producers of electricity generated from coal (or to the coal mines that supply such producers) i) a privileged status in the market or ii) to reduce the liabilities for some costs or charges during the period. This data is shown as the annual amount of forgone revenues.

[23] https://www.wto.org/english/docs_e/legal_e/24-scm.pdf, Downloaded on 20.06.2018.
[24] For instance: A government may borrow in financial markets under much better terms than a commercial entity. Therefore, when e.g. a government provides a loan or a loan guarantee, the benefit to the subsidy recipient is far greater than the cost to the government and is reflected in the interest rate differential between the interest rate on the loan to the beneficiary and the interest rate to a similar loan extended on commercial terms without government involvement.
[25] This approach is mainly based on the Overseas Development Institute and Climate Action Network methodology, see more at: https://www.odi.org/sites/odi.org.uk/files/resource-documents/11762.pdf, Downloaded on 22.06.2018.

Fiscal support - the rules for calculation of subsidy values

All direct budget transfers, with the exception of government loans, were included in their full amount as an amount of the subsidy in the year when they were executed.

Subsidy levels from loans obtained from governments were calculated by taking into account the comparison of interest rates on loans provided by governments and interest rates on comparable commercial loans in the domestic markets. In all presented cases it was determined that the market loan interest rates were higher than on the government issued loans. The amount of the subsidy was calculated as the benefit incurring to the loan recipient arising from the interest rate differential. The interest rate differential on the previous year's outstanding loan portfolio was calculated and shown as a subsidy in the current year.

The subsidization effect of arrears to governments for various taxes and contributions was computed by recognizing that such arrears constituted unrealized budget revenues and that governments must borrow equivalent amounts in the financial markets to balance budgetary revenues and expenditures. In this case, the subsidy is equal to the cost to the government of borrowing the amount equivalent to the budget revenue arrears. The actual government costs were computed using the yield on government bonds as the rate payable on total arrears in the given year.

The write-off of liabilities was treated in the total amount as a government subsidy in the current year.

The reduction of liabilities was calculated as a differential between the revenues that would have been generated if a particular measure had not been introduced and the revenues generated owing to the implementation of this measure in the given year.

3.2 Public finance support

Public finance support constitutes the second category of support and of direct subsidies covered in this study. This category includes loans, grants, guarantees and equity provided by institutions under governmental control or by international financial institutions to entities involved in coal-fired electricity generation. This category also includes the guarantees provided by governments to entities involved in coal-fired electricity generation; without state guarantees these entities either could not receive such credits, or would receive them in the market on far more unfavourable terms with respect to interest rates and maturities.

The level of support is shown as an outstanding balance of loans provided by government-controlled or owned institutions and loans provided by international financial organizations guaranteed by the government. Grants are shown in the year when they were received by the beneficiary. There was no equity provision in observed years.

Public finance support - the rules for calculation of subsidy values

The level of direct subsidies in the form of loans provided by government controlled institutions was computed by comparing the interest rates on loans received with interest rates on comparable commercial loans to determine the level of benefits obtained by the subsidy recipient. The differential between the interest rate on the loan received and the interest rate on comparable commercial loans was used to calculate the amount of direct subsidy. In situations where such loans were provided interest-free, the interest rates on comparable commercial loans were applied to outstanding loan balances in the previous year to compute the amount of the subsidy for the given year.

The grants were treated as subsidies in their full amount, in the year when they were provided.

When calculating the amount of direct subsidy from government-guaranteed loans, the approach was to calculate the direct benefit accruing to the beneficiary because the government guarantees the loan. The direct benefit and, consequently, the amount of subsidy to the beneficiary result primarily from the fact that, without a guarantee, such beneficiaries in many cases might not even receive such loans, neither in terms of size nor of interest rate and repayment period, which makes it hard to estimate the actual subsidy amount.

For the purposes of this study, the difference between the market interest rate and the interest rate on government-guaranteed loans was used as the basis for computing the subsidy amount. This difference is applied to the outstanding balance of the guaranteed loan in the previous year to determine the amount of subsidy in the given year.

3.3 SOE investment support

Investment by state-owned enterprises (SOEs) constitutes a third category of support and of direct subsidies. All companies that are more than 50%-owned by a government or government entities are considered to be SOEs. As majority owner, the state, through the governance bodies of these enterprises, has a decisive influence on their economic decisions about investment and allocation of resources.

In the given context, all funds, in the form of capital investments, credits, debts for electricity or advances extended by such enterprises to other business entities involved in coal-fired electricity generation (mainly suppliers) which could not be justified as usual economic decisions based on market principles (thereby negatively impacting their own business performance), are treated as support with elements of direct subsidies. They are shown either as the amount extended in the given year (capital investment) or as the total amount at end-year (credits, debts for electricity and advances). Investments by SOEs into their own production are not treated as direct subsidies because it is assumed that the management makes economically rational decisions for the company it manages.

SOE investment support - the rules for calculation of subsidy values

The equity investments were treated as subsidies in their full amount, in the year when they were provided.

The level of direct subsidies in the form of loans provided by SOEs was computed by comparing the interest rates on loans received with interest rates on comparable commercial loans to determine the level of benefits obtained by the subsidy recipient. The differential between the interest rate on the loan received and the interest rate on comparable commercial loans was used to calculate the amount of direct subsidy.

In situations where such loans were provided interest-free, the interest rates on comparable commercial loans were applied to outstanding loan balances in the previous year to compute the amount of subsidy for the given year.

Advance payments and electricity debts are treated as interest-free short-term loans, the interest rates on comparable commercial loans were applied to outstanding loan balances in the given year to compute the amount of subsidy.

The inventory method was used for identification of all support and direct subsidies, their assessment and calculation. An inventory method aims to identify, document and quantify a wide range of government interventions in energy markets, utilizing a mix of support delivery mechanisms. The goal of an inventory approach is twofold: to help government officials and the

public understand the overall scale of public spending and policies promoting particular energy pathways, and to help identify the most important leverage points for reform.

The inventory method implies the identification of all laws or government decisions that can be classified as channelling direct subsidies for the generation of electricity from coal. For this purpose, besides drawing on the official gazettes, budget execution documents and assorted governmental bodies' reports related to the issues covered in this study, extensive use was made of the relevant reports produced by international organizations.

In addition, information gathered directly from various government officials, information collected from audit reports of the companies involved in the generation of electricity from coal and available data from financial sector databases was also used.

Moreover, in the course of conducting research for this study, a series of meetings were held with the representatives of governments, international organizations and the NGO sector to validate the data and information collected, as well as to ascertain the views and plans on the development of electricity generation from coal and on the policies for providing direct subsidies for this type of production.

The research covered a 3-year period (2015-2017), and, in accordance with the methodology, the relevant figures are shown for each of these three years as well as their average.

All amounts are stated in both national and euro currencies, with the exchange rates for national currencies into euros calculated on the basis of the average annual exchange rates of the central bank of each given Contracting Party for which the data is shown.

3.4 Traceable Direct Subsidies

In absolute terms, the direct subsidies are highest in Ukraine and Serbia, while subsidization is the lowest in Montenegro.

The following table provides an overview of the average annual amount of direct subsidies calculated by category in the period 2015-2017:

in EUR million

Contracting Party	Fiscal support subsidies	Public finance support subsidies	SOE investment support subsidies	TOTAL
Bosnia and Herzegovina	11,50	3,83	26,22	41,55
Kosovo*	22,12	0,13	0,00	22,26
North Macedonia	0,00	3,68	0,00	3,68
Montenegro	0,49	0,45	0,01	0,96
Serbia	59,77	38,95	1,06	99,78
Ukraine	183,87	0,00	62,33	246,19
TOTAL	**277,74**	**47,05**	**89,62**	**414,41**

TABLE 5 - AVERAGE ANNUAL DIRECT SUBSIDIES BY CATEGORY OF SUBSIDIES

Source: Based on calculations in Annex 1

Direct subsidies categorized as fiscal support make up as much as 67 % of the total amount of direct subsidies.

This category most often includes direct funding from the state budget for various purposes and subsidies derived from the forgiveness and reprogramming of arrears to the budgets and public funds. It also includes subsidies based on provision of government loans, debt write-offs or

repayment of creditor claims from the state budget on the basis of issued loan guarantees, lowering of the fees payable to the state for production and resource utilization and VAT exemption.

Most frequently, the beneficiaries of the direct subsidies in this category were state-owned coal mines, which would in many cases either not remain operational without direct subsidies of this type, or would have to pass through the costs to the electricity prices. In other words, these subsidies are also an indirect subsidy to consumers through below-market electricity prices.

Public finance support is another form of direct subsidization. It is used by almost all Contracting Parties covered by the study to subsidize electricity generation from coal. The provision of state guarantees for foreign investment loans intended for the reconstruction and revitalization of existing coal-fired thermal power plants and modernization of coal mines is the main instrument the governments use to subsidize the financing cost in the coal electricity generation sector.

Low profitability levels of coal-fired electricity generation, particularly when supported by direct subsidies, prevent the sector from generating sufficient revenues that would permit setting aside adequate own funds for investment in modernization and environmental rehabilitation of its plants. Therefore, the sector is forced to borrow and to ask governments for loan guarantees.

In addition to the guarantees, public finance support also includes subsidies related to the loans extended by government-controlled institutions of some Contracting Parties and loans and grants provided by international organizations to business entities involved in electricity generation from coal.

The study established that electricity generation from coal is also subsidized through state-owned electric power companies. This type of subsidy, classified as SOE investment, takes the form of direct investment of state enterprises in capital, regular advances on production, extending loans and tolerance for non-payment of electricity bills by the entities in the coal production sector.

3.5 Overview per Contracting Party

3.5.1 Bosnia and Herzegovina

In Bosnia and Herzegovina (BiH), coal-fired electricity generation takes place in 5 thermal power plants, of which 4 are majority state-owned, while one is private. The private thermal power plant is owned by Energy Financing Team Group[26] (capacity 300 MW), while the state-owned companies “Elektroprivreda Republike Srpske” (ERS) and “Elektroprivreda BiH” (EPBiH) each own two thermal power plants.

ERS owns RITE Gacko and RITE Ugljevik and EPBiH owns TE Tuzla and TE Kakanj. The capacity of the TPPs owned by ERS is 600 MW and the capacity of the TPPs owned by EPBiH is 1,256 MW. Three of the thermal power plants own the coal mines that supply them, while the remaining two thermal power plants (TE Kakanj and TE Tuzla) are supplied from seven coal mines that operate as independent business entities within the Elektroprivreda BiH.

It was established that the electricity generation from coal during the examined period was supported in the following ways:

- through reprogramming and failure to collect tax and social security contribution arrears from coal mines;

[26] EFT Rudnik i termoelektrana Stanari http://www.eft-stanari.net/, Accessed on 16.08.2018.

- by lowering applicable fees for exploitation of natural resources for electricity generation to TPPs;

- through provision of state loan guarantees to TPPs; and

- by SOE investments in coal mines, provision of equity, loans and advances for continued production in the mines.

The amounts of direct subsidies for coal-fired electricity generation calculated in accordance with the rules presented in Section 3 are shown in the table below:

in EUR million, 2015-2017, and averages

Activity / instrument	2015	2016	2017	2015-2017 average per year
Fiscal support	5,99	14,36	14,14	11,50
Public finance support	5,06	3,66	2,78	3,83
SOE investment support	14,96	24,84	38,85	26,22
TOTAL:	**26,01**	**42,86**	**55,76**	**41,55**

TABLE 6 - ESTIMATED SUBSIDIES IN BOSNIA AND HERZEGOVINA

Source: based on calculations in Annex 1

The data on subsidies in the fiscal support category relate to i) reprogrammed and tax and contribution arrears for the state-owned coal mines in the Federation of Bosnia and Herzegovina (FBiH) and to ii) the total amount of budget revenue loss from the forgone fees for exploitation of natural resources for electricity generation, which was incurred when the Republika Srpska Government changed the regulations covering the rates of this fee early in 2016 (see Annex 1).

Within the public finance support category, there is currently only one outstanding state guarantee issued for the Japanese Government's loan for the Flue Gas Desulphurization Construction Project for the Ugljevik Thermal Power Plan (ODA loan). This loan is still in the implementation stage and within the grace period.

Capital investments of the Elektroprivreda BiH in the mines, loans and advances on the mines' output during the period were categorized as SOE investment support subsidies (see Annex 1).

The total sum of subsidies in the course of the period under observation was EUR 124.64 million. The subsidies provided within the scope of the support EPBiH continuously provides to the coal mines in the FBiH, in various forms, account for the greatest share of all subsidies, while accumulation of arrears by the mines in the Federation, and lowering of the fees through legal amendments in the Republika Srpska, considerably contributed to the overall increase in subsidization.

In early 2018, the Law on Charges for Exploitation of Natural Resources for Electricity Generation of the Republika Srpska (RS) was repealed. The earlier (2016) amendments to this law required the producers of electricity from coal in the Republika Srpska to pay a fee of EUR 0,0015/kWh of generated electricity instead of EUR 0,0031/kWh. At the same time, the RS Law on concessions was amended, and it now introduces a concession fee for exploitation of power generating facilities, and for producers of electricity from coal this fee is now EUR 0,00169/kWh of generated electricity.

When the average annual amount of identified subsidies is compared with the average annual coal-fired electricity generation in BiH, we found that each MWh of electricity generated from coal during the period received an average subsidy of EUR 4,12.

This data clearly shows that the authorities in BiH provide strong support to the generation of electricity from coal, thereby interfering with free and fair market competition, both in the domestic market and in the markets to which BiH, as an active exporter, supplies electricity. Such a subsidy policy, besides causing market distortion, also affects inflows into public funds, as the reprogramming of liabilities and outstanding debt jeopardizes operation of public funds (health care and pensions).

In 2018, EPBiH continued to support coal mines and the Federation Government drafted the Programme of Restructuring of the Electric Power Sector of the Federation of BiH, which is still in the process of being re-written and in parliamentary procedure. This programme also covers the problematic coal mines in the Federation of BiH and, according to available information, it does not envisage the closure of non-profitable mines or a section of certain mines which is an indication that the existing subsidization policy will continue.

In August 2018, the Federation Government adopted the decision to issue a guarantee for EPBiH for construction of the new Block 7 at the Tuzla Thermal Power Plant, with the capacity of 450 MW, worth EUR 613.990.000 to the China EXIM Bank, pursuant to the Contract on Engineering Works, Procurement and Construction of the Block 7 concluded with the Chinese consortium comprised of the China Gezhouba Group Company and GEDI /Guandong Electric Power Design Institute. The final decision about the guarantee and the borrowing of the Elektroprivreda BiH for this purpose will be made by the Parliament of the Federation of BiH. If the Parliament approves the guarantee, the benefit to EPBiH will be primarily reflected in lower interest costs than the costs they would have if borrowing on the financial market.

3.5.2 Kosovo*

In Kosovo*, electricity generation from lignite is the dominant form of production, as the share of coal-fired thermal power plants in the total installed electricity generation capacity is 92.5%.

The installed capacity consists of two state-owned coal-fired thermal plants (Kosova A and Kosova B) that are vertically integrated with the mines in the KEK (Kosovo Energy Corporation).

In the period under consideration, the following types of subsidies for electricity generation from coal were identified (see Annex 2):

- direct budget transfers;
- debt write-off;
- loans from the budget; and
- provision of state loan guarantees.

A summary overview of calculated subsidies, by categories, is presented below:

in EUR million, 2015-2017, and averages

Activity / instrument	2015	2016	2017	2015-2017 average per year
Fiscal support	37,96	15,10	13,30	22,12
Public finance support	0,16	0,13	0,11	0,13

SOE investment support	0,00	0,00	0,00	0,00
TOTAL:	**38,12**	**15,23**	**13,42**	**22,26**

TABLE 7 - ESTIMATED SUBSIDIES IN KOSOVO*

Source: based on calculations in Annex 1

The fiscal support subsidies to electricity generation from coal in Kosovo* (see Annex 2) relates to a government loan and regular budget financing intended as support to business operations and to cover the costs of KEK's regular operating activities, in view of the low level of efficiency of the thermal power plant and major problems related to the collection of bills for electricity supplied. In 2015, the Government of Kosovo* wrote off interest payments on loans extended to KEK.

During the period in question, the sum total of subsidies provided was EUR 66.77 million.

When the average annual amount of identified subsidies is compared with the average annual electricity generation from coal in Kosovo*, it was found that each MWh of electricity generated from coal during the period in question received an average subsidy of EUR 4.15, which represents the second highest level of subsidization per 1 MWh across all Contracting Parties covered by the study.

In the coming period, the Kosovo Energy Corporation plans to invest EUR 445 million in expansion and modernization of the coal mines, while an investment of EUR 269,940,000 is planned for extension of the useful life and environmental rehabilitation of the Kosova B thermal power plant.[27]

In 2018, the Government of Kosovo* continued activities on the construction of a new thermal power plant with 450 MW of capacity (e Re Project), in cooperation with a private investor ContourGlobal Terra 6 Sàrl (GenCo). The planned value of this investment is over EUR 1 billion, and the Government of Kosovo* undertook to issue a state guarantee for the implementation of the project[28] and signed 8 commercial agreements with the investor.[29] According to the agreements, the government of Kosovo* together with other public bodies guarantee to the investor the purchase of all produced quantities of electricity at a guaranteed price of 80 EUR / MWh, compensation for all development costs of the project, VAT and custom duties exemption, reimbursement of environmental remediation costs and start-up and hot standby charges. In addition, KEK is obligated to provide land for the construction site and lignite supply under favourable conditions for the investor and the government assumed the obligation to pay the investor the difference in the price of lignite procurement if KEK is not able to fulfil its obligations in the supply. All these elements of the agreements mentioned above can be treated as subsidies with which the government will support the construction and operation of a new thermal power plant.

3.5.3 Montenegro

The capacity for electricity generation from coal accounts for 22.5% of the electricity generation sector in Montenegro. The sole thermal power plant - Pljevlja Thermal Power Plant - operates

[27] Operations and Challenges of the Kosovo Energy Corporation, New Mining Development Plan, Investments in Ensuring Energy Supply, 2018. http://mzhe-ks.net/repository/docs/2._KEK_Presentation_3-rd_HLEF.pdf, Downloaded on 16.10.2018

[28] New Kosovo Project, 2018. http://mzhe-ks.net/repository/docs/1._Kosova_e_Re_20March18_FINAL_EN_REV_(1).pdf , Downloaded on 16.10.2018.

[29] Commercial Contracts of TC „Kosova e RE" Project http://mzhe-ks.net/en/commercial-contracts-of-tc--kosova-e-re--project#.XGPkO9JKjZ4, Accessed on 25.11.2018.

as a part of majority state-owned company "Elektroprivreda Crne Gore" (EPCG). The second largest shareholder is the Italian utility A2A. The Pljevlja Thermal Power Plant is supplied with coal from the Pljevlja coal mine, currently 100% owned by EPCG[30].

The subsidies for electricity generation from coal in Montenegro (see Annex 4) were provided in the form of:

- reprogramming and failure to collect tax and social contribution arrears from the coal mine;

- provision of state loan guarantees to TPP; and

- SOE investment support to the coal mine.

The sum total of direct subsidies within the scope of support provided to coal-fired electricity generation, calculated in accordance with the rules presented in Section 3, is shown in the table below:

	in EUR million, 2015-2017, and averages			
Activity / instrument	**2015**	**2016**	**2017**	**2015-2017 average per year**
Fiscal support	0,26	0,72	0,50	0,49
Public finance support	0,58	0,44	0,35	0,45
SOE investment support	0,04	0,00	0,00	0,01
TOTAL:	**0,88**	**1,16**	**0,85**	**0,96**

TABLE 8 - ESTIMATED SUBSIDIES FOR MONTENEGRO

Source: based on calculations in Annex 1

The fiscal support category includes the Pljevlja coal mine's tax and contribution payment arrears, which the government consolidated and reprogrammed over 5 years, with 2017 as the repayment start date. Public finance support category subsidies are related to a government guaranteed loan provided by KfW to the TPP.

The total sum of subsidies during the period in question was EUR 2,88 million, which makes Montenegro the Contracting Party with the lowest subsidies of all Contracting Parties covered in this study.

When the average annual amount of identified subsidies is compared with the average annual coal-fired electricity generation, we found that each MWh of electricity generated from coal during the period received an average subsidy of EUR 0,74, which constitutes the lowest level of subsidy per 1MWh of all Contracting Parties covered in the study.

During this period there were no direct subsidies to EPCG, but it is worth noting that, pursuant to its 2014 Budget Law, the Government of Montenegro in 2014 converted EUR 45 million of EPCG's tax and contribution arrears into the company's shares, thereby increasing its own stake. [31]

[30] RU Pljevlja: http://www.rupv.me/en/vlasnicka-struktura EPCG: http://www.montenegroberza.com/upload/documents/issuer/EPCG/SIPL%20EPCG%2030.09.2018.pdf

[31] See Audit Report for EPCG https://www.epcg.com/sites/epcg.com/files/prilog_1_finansijski_izvjestaji_epcg_sa_misljenjem_revizora-_2016-mne_1.12.2017.pdf, Downloaded on 04.09.2018.

In July 2017, the Italian company A2A, the second-largest EPCG shareholder, on the basis of its contract with the Government of Montenegro, activated a Put Option.[32] In accordance with the conditions defined by the Put Option, the Government of Montenegro was supposed to pay A2A an amount of EUR 250 million for the purchase of EPCG shares (accounting for 41,75% of total shares), in seven annual instalments, but it chose to complete this in two instalments. Upon the disbursement of each instalment, A2A shall transfer a proportional portion of its shares, and at the end of this period, the Government of Montenegro will hold 98,77% of the total shares of EPCG. A2A immediately transferred all governance rights to the Government of Montenegro. As the payment of the first tranche was effected in 2018 by the Government of Montenegro, e.g. after the period covered in this study, the potential direct subsidies arising from the market share price and the share price paid by the Government have not been included.

In June 2018, EPCG became the majority owner of the Pljevlja coal mine by obtaining 96,78% of its shares through a public invitation for the purchase of shares, for a total of EUR 31,37 million.[33]

In 2018, EPCG commenced activities on the implementation of a planned investment in the Pljevlja TPP of EUR 60 million for environmental rehabilitation of Block One and recultivation of the existing slag and ash deposit site. The planned investment should be completed by 2021.[34] Having restored its ownership of EPCG, and thereby the ownership of the Pljevlja coal mine, the Government of Montenegro intensified its activities on the implementation of the initiative to construct Block Two of the Pljevlja TPP. The construction of the second block of TPP Pljevlja will cost over EUR 300 million. IT is unlikely that EPCG would be able to finance the construction without the help of the government or borrowing under a government guarantee.

3.5.3 North Macedonia

In North Macedonia, coal-fired thermal power plants account for 40% of the total installed electricity generation capacity. Electricity from coal is generated in two thermal power plants (REK Bitola and REK Oslomej) which, together with the coal mines, operate as a vertically integrated part of the state company “Elektroprivreda Makedonije” (ELEM).

During the period covered in this study, there were no direct subsidies for electricity generation from coal, with the exception of the public finance support segment, which took the form of state loan guarantees (see Annex 1).

[32] In finance, a put or put option is a stock market device which gives the owner the right, but not the obligation, to sell an asset, at a specified price, by a predetermined date to a given party.
[33] http://www.bankar.me/2018/06/19/elektroprivreda-isplatila-3137-miliona-eura-vlasnicima-rudnika-uglja/, Accessed on 06.09.2018.
[34] https://balkangreenenergynews.com/rs/idejni-projekat-ekoloske-rekonstrukcije-te-pljevlja-radi-kompanija-esena/ , Accessed on 06.09.2018.

The total sum of direct subsidies within the scope of support provided to coal-fired electricity generation and calculated in accordance to the rules presented in Section 3 is shown in the table below:

in EUR million, 2015-2017, and averages

Activity / instrument	2015	2016	2017	2015-2017 average per year
Fiscal support	0,00	0,00	0,00	0,00
Public finance support	4,38	3,72	2,93	3,68
SOE investment support	0,00	0,00	0,00	0,00
TOTAL:	**4,38**	**3,72**	**2,93**	**3,68**

TABLE 9 - ESTIMATED SUBSIDIES FOR NORTH MACEDONIA

Source: based on calculations in Annex 1

The total sum of all subsidies during the period in question was EUR 11,3 million.

According to the data and information collected (see Annex 3), electricity generation from coal was supported through subsidies categorized as public finance support, which amounted to EUR 1,23/MWh of generated electricity on average.

In the coming period[35], ELEM plans to invest EUR 41 million in the further modernization of the existing mines, as well as EUR 140 million in the continued modernization and environmental rehabilitation of the Bitola Thermal Power Plant.

The opening of a new coalfield is planned, with the required investment estimated at EUR 122,5 million. As the Oslomej Thermal Power Plant has problems with delivery of coal and technological obsolescence, ELEM is considering the possibility of converting this thermal power plant from coal to gas as well as the economic viability of a revitalization and modernization of this thermal power plant combined with an option to supply it with high-grade imported coal. The value of Stage One of the Oslomej Thermal Power Plant revitalization project is estimated at EUR 45 million. In view of ELEM's financial position, such ambitious plans signal that additional government assistance will be required for their implementation.

3.5.4 Serbia

In Serbia, electricity generation from coal constitutes a major source of electricity, accounting for 55.96% of total installed capacity.

The electricity generation from coal in Serbia is run by the state-owned "Elektroprivreda Srbije" (EPS) in two segments. The "Termoelektrane Nikola Tesla" segment includes the TPP Nikola Tesla A (6 blocks), TPP Nikola Tesla B (2 blocks), TPP Kolubara (5 blocks) and TPP Morava (1 block). The "Termoelektrane Kostolac" segment includes the TPP Kostolac A (2 blocks) and TPP Kostolac B (2 blocks). Coal for TPP needs is supplied from EPS's own strip mines located in the vicinity of the thermal power plants. In addition to its own coal, in order to operate its thermal power plants, EPS uses also coal from underground coal mines, which are owned by the state-held company PEU "Resavica".

[35] Elem: Development and investment plan 2018 – 2022, 2018. http://www.elem.com.mk/wp-content/uploads/2017/04/Investiciski-Plan-2018-2022.pdf, Downloaded on 23.10.2018.

It was established that the electricity generation from coal was subsidized during this period, in the following ways (see Annex 1):

- direct budget transfers;
- international financial organizations grants;
- reprogramming and failure to collect tax and social security contribution arrears from coalmines;
- debt write-off;
- provision of state loans;
- provision of loans by state controlled institutions;
- provision of state loan guarantees; and
- SOE investment.

in EUR million, 2015-2017, and averages

Activity / instrument	2015	2016	2017	2015-2017 average per year
Fiscal support	43.53	91.24	44.53	59.77
Public finance support	50.78	27.30	38.78	38.95
SOE investment support	1.17	0.96	1.06	1.06
TOTAL:	**95.48**	**119.50**	**84.37**	**99.78**

TABLE 10 - ESTIMATED SUBSIDIES FOR SERBIA

Source: based on calculations in Annex 1

The direct subsidies that fall into the fiscal support category relate mainly to the subsidies in the form of direct budget transfers, a government loan for the coal mines and taxes and contributions in arrears, i.e. for the PEU "Resavica", which is not a part of EPS, to the government write-off of a portion of EPS debt on the loans from the Russian Federation originated pre-1990 and a direct budget transfer to EPS.

The subsidies shown in the public support category are derived from international loans guaranteed by the government, loans provided by institutions under government control and grants provided by international organizations. The largest support for electricity production from coal is provided by the government through loan guarantees. In the observed period, the total amount of loans covered by the state guarantees amounted to more than EUR 1,3 billion (see Annex 1).

The subsidies shown under SOE investment support are derived from EPS support to PEU "Resavica" in the form of loans and electricity bill debts.

The total sum of subsidies during the period was EUR 299,5 million, making the subsidies in Serbia the second highest, in absolute terms.

When the average annual amount of identified subsidies is compared with the average annual coal-fired electricity generation, we found that each MWh of electricity generated from coal during the period received an average subsidy of EUR 4,03.

The data presented above makes it clear that the authorities in Serbia strongly support electricity generation from coal with all types of subsidies. The greatest share of the subsidies is used to maintain operations in the underground coal pits operated by PEU "Resavica".

In 2018, the RS Government and EPS continued to support the mines that operate the underground pits.

As part of the activities on the restructuring and financial consolidation of PEU "Resavica", implemented by the Government of Serbia with the support of the World Bank Group, the closing of two underground coal mines belonging to PEU "Resavica"[36] was announced in 2018, which constituted one of the conditions for the new agreement between the Government of Serbia and the IMF. At the same time, opening of the new "Poljana" underground mine near Kostolac is planned up to 2020.

In the coming period, EPS plans to continue all activities on the revitalization and modernization of the mines and thermal power plant facilities, as well as to continue the activities on the construction of the new block Kostolac B3, with the capacity of 350 MW[37]. The construction of the new block Kostolac B3 started in November 2017 with the objective of completion at the end of 2020[38]. The total planned investment in the new block is USD 613 million, financed 85% by China Exim Bank (20 years loan, 7 years grace period, 2,5% interest rate) and 15% by EPS.

In accordance with the Action Plan for the Protection of Environment, EPS intends to invest EUR 650 million in the thermal power plants and mine environmental rehabilitation projects.[39] In view of EPS's financial position, such ambitious plans signal that additional government assistance will be required for their implementation.

3.5.5 Ukraine

Coal represents the second most important energy source for electricity generation in Ukraine, next to nuclear energy. The capacity for electricity generation from coal accounts for 47,44 % of the total installed capacity but some of the plants are not operational year-round or are operating using another fuel.

The production is organized in 3 enterprises: Donbasenergo (1 TPP – capacity 0,88 GW), majority privately held, DTEK (9 TPPs[40] - capacity 16,3 GW), privately held, and Centrenergo (3 TPPs – capacity 7,6 GW), which is majority state-owned. The thermal power plants are supplied with coal from private mines, imports and state-owned coal mines. Due to military operations in eastern Ukraine, a considerable number of mines is currently outside the control of the Ukrainian authorities. Both the supply of coal to thermal power plants and the electricity generation itself take place in complex conditions.

According to the Secretariat of the Cabinet of Ministers of Ukraine (2018), there are 102 state-owned coal mines, but most of them are located in the territory that is not controlled by the government. Only 33 state-owned coal mines are controlled by the government and only 4 of them are profitable.[41]

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[36] https://www.blic.rs/biznis/drzava-daje-pet-miliona-evra-za-pocetak-zatvaranja-rudnika-resavica/1ztwfgq, Accessed on 22.08.2018.

[37] http://195.250.121.20/SiteAssets/Lists/Sitemap/EditForm/Trogodisnji%20program%20poslovanja%20JP%20EPS%20za%202017-2019.pdf, Accessed on 08.10.2018.

[38] https://www.b92.net/biz/vesti/srbija.php?yyyy=2017&mm=11&dd=20&nav_id=1327301, Accessed on 02.11.2018.

[39] http://rs.n1info.com/Biznis/a349616/EPS-ulaze-860-miliona-evra-u-ekoloske-projekte-do-2025.html, Accessed on 09.10.2018.

[40] Excluding Zuivska TPP, over which DTEK lost control in 2017 because of the armed conflict in Ukraine.

[41] Secretariat of the Cabinet of Ministers (2018), Head of Government: We should hear the noise of production in the mines, not knocking of helmets due to wages arrears, https://www.kmu.gov.ua/ua/news/glava-uryadu-na-shahtah-maye-buti-shum-virobnictva-ne-stuk-kasok-cherez-borgi-po-zarplati, Accessed on 28.11.2018.

In this period, subsidies for electricity generation from coal were provided in the form of (see Annex 6):

- direct budget transfers;
- failure to collect tax and social security contribution arrears;
- VAT exemption; and
- SOE investment support.

The sum total of direct subsidies within the scope of support provided for coal-fired electricity generation calculated following the rules presented in Section 3 is shown in the table below:

in EUR million, 2015-2017, and averages

Activity / Instrument	**2015**	**2016**	**2017**	**2015-2017 average per year**
Fiscal support	128,07	199,27	224,26	183,87
Public finance support	0,00	0,00	0,00	0,00
SOE investment support	66,66	64,13	56,18	62,33
TOTAL	**194,73**	**263,40**	**280,44**	**246,19**

TABLE 11 - ESTIMATED SUBSIDIES FOR UKRAINE

Source: based on calculations in Annex 1

In terms of fiscal support, the state mines receive direct subsidies from the budget of Ukraine for miners' wages, costs and essential modernization and raising the level of protection in the mines. Although the Government of Ukraine significantly reduced subsidies to state mines in the previous period and it is making considerable efforts in this regard, the direct fiscal support still constitutes the only way to ensure that most state-owned coal mines remain in operation.

In addition to the mines, Centrenergo also received direct financial aid from the budget, while other subsidies that fall in this category relate to the debts of the mines and Centrenergo from tax and other arrears to the state and to repayment of the loan for which the state issued a guarantee.

Besides that, a provision on VAT exemption for operations regarding the supply of coal and coal products (revenue forgone) introduced in January 2016 and extended several times constitutes a great portion of fiscal support subsidies. In the current version of the Tax Code, it is indicated as a temporary measure (until January 2022). The standard VAT rate in Ukraine is 20%, which also applies to the energy sector.

During this period, there was no publicly available data that would point to subsidization that would fall into the public finance support category, while the arrears in payment of electricity bills were classified into the SOE investment support category.

During the period, the sum total of subsidies was EUR 738,57 million, of which direct budget transfers accounted for EUR 313,24 million, or as much as 42,4 %.

When the average annual amount of identified subsidies is compared with the average annual actual output of electricity from coal in Ukraine, we find that each 1 MWh of electricity from coal received an average subsidy of EUR 5,69 during the period in question.

In 2017, the Government of Ukraine adopted the Energy Strategy of Ukraine until 2035[42], which envisages that a restructuring of the coal sector by closing unprofitable mines, privatization and establishment of coal markets will be completed by end-2020. A harmonization of the operation of thermal power plants with environmental standards was envisaged for the next planning period in order to extend their useful life. The plans were also made to build replacement capacities for electricity generation from coal. The privatization of the "Krasnolymanska" state-owned coal mine, as well as Centrenergo, the sole state-owned company for electricity generation from coal, were announced in 2018.[43]

In 2018, the Government of Ukraine issued a government guarantee of UAR 1.054,62 million (EUR 35,15 million) for the implementation of investment projects in 5 state-owned mines.[44]

Although the Government of Ukraine made significant efforts to reduce the subsidies for electricity production from coal in the previous period, measures like extending the exemption from VAT for operations regarding the supply of coal up to 2022 and issuing new government guarantees for loans to state coal mines indicates that subsidies related policies will still play a significant role in the forthcoming period.

[42] Cabinet of Ministers of Ukraine (2017), Resolution of the Cabinet of Ministers № 605-p as of 18 August 2017 on the Approval of the Energy Strategy of Ukraine "Security, Energy Efficiency, Competitiveness" for the period up to 2035 (in Ukrainian*)* https://www.kmu.gov.ua/ua/npas/250250456, Downloaded on 05.11.2018.

[43] https://nucc.no/the-government-of-ukraine-has-approved-the-list-large-state-owned-companies-to-be-privatized-in-2018/ , Accessed on 16.11.2018.

[44] https://open4business.com.ua/govt-provides-guarantees-for-uah-1-1-bln-loans-to-five-coal-enterprises/, Accessed on 15.11.2018.

4 INDIRECT SUBSIDIES

Indirect subsidies in the context of this study are identified as any allowance, exemption or waiver of otherwise reasonable costs of a power producer, due to its status and legal framework, providing to it a competitive advantage in the respective market.

As the flow of economic benefits to the receiving undertaking is not obvious and not reported as a financial transaction, the indirect subsidies are hidden and require deeper insight.

As part of the study, the Energy Community Secretariat analysed two types of indirect subsidies:

- non-payment of CO2 emissions; and
- operation at a low or negative level of profitability, uncomparable to conditions for other market participants.

To analyse the hidden subsidies to electricity production, first an exploration of operational costs and costs of financing is needed.

4.1 Analysis of the costs of production

4.1.1 Operating costs of coal power plants

The costs of electricity generation are disclosed in the audited and published financial statements of power producers. The Energy Community Secretariat analysed the audited financial statements of utilities operating thermal power plants and found that they contain sufficient information to estimate with sufficient confidence the actual costs of producing electricity.

It is worth noting that in all published audited reports, the auditors' opinions were qualified, with certain reservations made with respect to the presented information, except for Kosovo Energy Corporation (KEK). The main reservations are related to the disclosed fair value of the property, plants and equipment, others to measuring exposure and associated provisions for future liabilities.

In the case of KEK, the auditor noted that the company KEK does not possess property deeds for the assets in use, but did not qualify the financial statements.[45] The disclosed value of assets in use by KEK is recognized partly on the basis of an estimate and partly on the basis of historic cost. No revaluation was performed after 2005, therefore, these values cannot be used with confidence for benchmarking.

Some utilities in the Energy Community Contracting Parties are still vertically integrated with a distribution branch. This is the case in Elektroprivreda Bosne i Hercegovine (EPBIH), Elektroprivreda Hrvatske zajednice Herceg-Bosna (EPHZHB) and Elektrani na Makedonija (ELEM). In these cases, the reported costs of distribution (and passed-through cost of transmission) are taken out.

All analysed power producers operate mixed coal and hydro plants, a few of them also oil and gas, wind and solar plants.

Power producers in Elektroprivreda Republike Srpske are the only ones that are separate legal entities which prepare and publish separate financial reports, including for the two coal-fired thermal power plants. ELEM from North Macedonia prepares a single financial report, but with identified operating segments disclosing the costs and revenues of its power plants.[46]

It is also worth noting that the plants in operation are mostly at the end of their originally planned useful lives. All analysed state-owned thermal power plants are more than 30 years old. Some plants were

[45] In case of e.g. EPCG and ELEM, the incomplete ownership documentation was the basis for the qualified opinion.

[46] Power producers in Ukraine are also separate legal entities within integrated undertakings, but their audited financial reports are not publicly accessible.

partially generally rehabilitated, others, which opted out of the emissions rules under the Large Combustion Plants Directive, were limited to a maximum of 20.000 hours of further operation.

The planned rehabilitation, which requires power plants to be in compliance with the LCPD, will increase the asset value and subsequently the operating costs, depreciation costs and costs of financing interest on loans.

Plants to be opted out will have to be depreciated over a maximum five-year period (starting 2018) and 20.000 hours of operation with maximum capacity. The impact of this fact has yet to be measured, recognized and disclosed in the companies' accounts.

The balance sheets of all observed power producers show that their fixed assets (property, plants and equipment) have depreciated by between 50 to 70%. Even for the companies that have yet to unbundle, the level of physical wear and tear of assets will probably remain the same.

Power producer	Purchase Value	Accumulated depreciation	Net book value	Depreciated purchase value
(Values in EUR)	[1]	[2]	[3]	[4]=[2]/[1]
EPBIH (BIH)	3.779.388.670	2.387.949.415	1.391.439.255	63%
EPCG (MNE)	1.119.656.097	566.893.942	552.762.155	51%
EPS (SRB)	9.330.467.475	4.724.116.183	4.606.351.292	51%
KEK (KOS*)	674.179.000	390.033.000	284.146.000	53%
ERS-TPP (BIH)	1.227.440.276	704.490.902	522.949.374	57%
ELEM (MKD)	1.896.317.805	1.265.205.967	631.111.837	67%

TABLE 12 – VALUATION OF PROPERTY, PLANT AND EQUIPMENT

Thanks to the fact that the two coal-fired thermal power plants (TPP Gacko and TPP Ugljevik from Elektroprivreda Republike Srpske) are legally unbundled and subsequently prepare and publish their own financial reports, the purchase value of property, plants and equipment, as disclosed in their balance sheets, amounts to around 2000 EUR/kW of installed power. The indicative value is also the purchase value of EPS (Serbia) and ELEM (North Macedonia), dominated by coal-fired capacities, where the average purchase value of generating capacities exceeds 2300 EUR/kW. (In the light of this fact, the disclosed purchase value of KEK's (Kosovo*) generation assets (700 EUR/kW of installed capacity) cannot be taken as a benchmark for any further elaboration. For this reason, the comparative values of KEK will be disregarded throughout this report.)

The aim is to determine or, where costs are not disclosed in a company's accounts, to make an estimate with sufficient confidence of the operating costs of coal-fired thermal power plants.

The operating costs of hydro power producers in ERS (Bosnia and Herzegovina) and ELEM (North Macedonia) in 2017 were 29 EUR/MWh and 34 EUR/MWh respectively. According to the financial reports of EPHZHB (Bosnia and Herzegovina), which operates only hydro power plants, the average operating expenditures of the generation and supply branch in 2017 were nearly 30 EUR/MWh.

For the purpose of this study, the amount of 30 EUR/MWh was taken as a benchmark for the operating costs of power production from hydro power plants. For utilities operating hydro and coal power plants without disclosed separate reports, the assumed average costs of 30 EUR/MWh for hydro power plants was deducted from the total costs in order to estimate the operating costs of the coal-fired thermal power plants.

Firstly, the operating costs of power generation from coal are compared, not taking into account the costs of financial and investment activities.

The results are shown in the table below.

Data for 2017	Produced electricity from coal	Total operating expenses	Estimated operating expenses of coal TPPs[47]	Operating expenses of coal TPPs
	MWh	EUR	EUR	EUR/MWh
[1]	[2]	[3]	[4]	[5]=[4]/[2]
EPBIH	6.007.230	330.953.610	302.711.310	50
EPCG	1.265.000	108.416.208	79.130.208	63
EPS	24.240.000	1.235.229.017	942.309.017	39
KEK[48]	5.725.962	145.509.000	145.509.000	25
ERS	2.870.620	128.463.596	128.463.596	45
ELEM	3.145.100	157.730.020	157.730.020	50
UKRAINE	44.457.000			

TABLE 13 - OPERATING EXPENSES OF COAL FIRED POWER PRODUCERS

The reported net operating costs of power generation in coal-fired thermal power plants are in the range between 40 and 60 EUR/MWh, not including financial costs, such as incurred interest on loans and similar, excluding any return on investment. (KEK is excluded from the benchmark because of dubious asset values.)

The conclusion is that, even when taking into account the reserves related to the disclosed asset value and provisions, any thermal power plant in the Energy Community charging less than 40 EUR/MWh is likely to incur operational losses.

Selling electricity at prices shown in Table 14, the producers cannot earn any return on investment or recover the incurred interest on loans.

4.1.2 Costs of financing

Financial leverage in all observed companies (except for KEK) seems solid. Financing of long-term assets is provided mainly from equity and the equity ratio is around 0,90.

Values in 000 EUR / Producers	Long-term assets	Equity	of which: retained earning /accumulated loss	equity/long-term assets
[1]	[2]	[3]	[4]	[5]=[4]/[2]
EPBIH	1.557.885	1.528.503	107.150	98%
EPCG	891.613	990.002	-14.434	111%
EPS	7.711.190	5.704.323	-917.246	74%
KEK	284.163	122.868	-442.954	43%
ERS	522.949	440.009	20.465	84%
ELEM	655.354	575.113	18.386	88%

TABLE 14 - FINANCIAL GEARING OF POWER PRODUCERS

It is clear that the financing of long-term assets is provided mostly from own equity and that long-term debts are incurred mainly for regular operation, to finance working capital and current liabilities.

Considering the higher requirements for working capital in coal production in comparison with hydro power production, most of the financial expenses disclosed in companies' accounts may be assigned to coal production.

[47] Cost of production from hydro estimated at average 30 EUR/MWh.

[48] The cost calculation for KEK cannot be taken for benchmarking due to abnormally low value of assets in use.

However, for the sake of prudency, to avoid arbitrarily inflating the costs of coal-fired production, the financial expenses reported in the bundled reports (EPBIH, EPCG, EPS, ELEM) are allocated to coal-fired power plants in the same proportion as the share of operating expenses of thermal power plants in total operating expenses of a utility.

Power producer	Produced electricity from coal	**Operating expenses**	Financial expenses	Total expenses	Unit costs of electricity from coal fired TPPs
	GWh	**000 EUR**	**000 EUR**	**000 EUR**	**EUR/MWh**
[1]	[2]	**[3]**	**[4]**	[5]=[4]+[3]	**[6]=[5]/[2]**
EPBIH	6.007	302.711	2.116	304.828	**51**
EPCG	1.265	79.130	1.859	80.989	**64**
EPS	24.240	942.309	16.192	958.501	**40**
KEK	5.726	145.509	2.882	148.391	**26**
ERS	2.871	128.464	1.730	130.194	**45**
ELEM	3.145	157.730	8.480	166.211	**53**
Ukraine	44.457				

TABLE 15 - COSTS OF COAL FIRED POWER PRODUCTION INCLUDING FINANCING COSTS IN 2017

The numbers show that for the existing, obsolete and significantly depreciated coal-fired power plants, where equity covers more than 80% of the capital asset value (this means that financing costs are negligible), the price of electricity below unit costs as presented in Table 16 puts all producers below zero profitability.

4.2 Incorporation of coal subsidies

The first chapters of this study show that all analysed Contracting Parties support coal-fired electricity production through direct state subsidies. The study found that subsidies exceeded EUR 1.2 billion over three years (2015-2017).

The direct subsidies identified in this study and attributed to respective year 2017 are presented in this table:

subsidies 2017	direct budget contributions	Other state contributions	benefits from soft loans	benefits from arrears for duties	benefits from SOE grants and investment in equity	benefits from soft loans from SOE	TOTAL for 2017
[in 000	EUR]						
EPBIH	6.600				4.962	1.450	13.012
EPCG			350	500			850
EPS	20.890	340	23.050	1.120	4.012	530	49.942
KEK	5.920	7.390				1.060	14.370
ERS		7.530	2.780				10.310
ELEM			2.930				2.930
Ukraine	111.360			25.950		56.180	193.490

TABLE 16 – DIRECT SUBSIDIES 2017

For the purpose of this study, the subsidies received in the course of 2017 in the form of SOE investment in equity and grants for fixed assets are allocated over 10 years when benefits are expected to flow to the recipients (Investment EP BIH of EUR 37,4 million in the equity and EPS grant of EUR 30,4 million for

acquisition of fixed assets of coal mines are discounted to EUR 4,96 million and EUR 4,01 million per annum respectively)[49].

Without these subsidies, the power producers would directly or indirectly, through increased cost of coal, incur higher costs, annually reaching nearly EUR 300 million, and EUR 193 million in Ukraine alone.

If the subsidies to coal were eliminated, the operating costs in 2017 would have been:

Power producer	Produced electricity from coal	**Operating and financial expenses**	**Unit costs of electricity from coal**	Direct subsidies to power production	Annual costs adjusted for direct subsidies	**Adjusted costs of electricity from coal**	Impact of direct subsidies on TPP' cost
	GWh	**000 EUR**	**EUR/MWh**	000 EUR	000 EUR	**EUR/MWh**	%
[1]	[2]	[3]	[4]=[3]/[2]	[5]	[6]=[3]+[5]	[7]=[6]/[2]	[8]=[7]/[4]-1
EPBIH	6.007	304.828	**51**	13.012	317.840	**53**	4%
EPCG	1.265	80.989	**64**	850	81.839	**65**	1%
EPS	24.240	958.501	**40**	49.942	1.008.443	**42**	5%
KEK	5.726	148.391	**26**	14.370	162.761	**28**	10%
ERS	2.871	130.194	**45**	10.310	140.504	**49**	8%
ELEM	3.145	164.787	**52**	2.930	167.717	**53**	2%
Ukraine	44.457	0	0,00	193.490	193.490		

TABLE 17 - OPERATING COSTS OF POWER PRODUCERS ADJUSTED FOR COAL SUBSIDIES

The table shows that funnelling subsidies to coal and coal-based power producers kept the costs of electricity artificially below the actual cost levels, ranging from 1 to 10 %.

The costs presented in the table above are the costs of plants mainly at the end of their original design life, extended after significant rehabilitation and overhaul.

It also shows that without subsides the operation would not be profitable if power would be sold below the prices calculated above, where 40 EUR/MWh would be the absolute minimum.[50]

On top of that, environmental regulations require urgent investments in filters, scrubbers, precipitators and other pollution abating and monitoring equipment in the existing old plants that will increase the capital costs further.

4.2.1 Comparable new power plants

To check the plausibility of the amounts presented in the calculations of actual costs of production, an estimate of the costs of production of electricity from a new power plant is presented below.

[49] VAT exemption granted to coal mines in Ukraine is also taken out from annual amount of subsidies for 2017, assuming that coal mines are taxable persons entitled to deduct VAT.
[50] KEK data are disregarded from comparison for reasons explained above.

The capital costs of new power plants can be determined on the basis of widely available manufacturers' information.

It is commonly accepted that the unit costs of coal-fired thermal power plants with conventional technology are in the range of 1000-2000 EUR/kW of installed capacity.

Considering that infrastructure is mostly developed and qualified workforce is at hand, the Energy Community Secretariat estimated the capital costs at 1500 EUR/kW of installed capacity. This number also better fits with the asset valuation of existing power producers shown in Table 13[51] and recently built plants with initial investment of nearly 2000 EUR/kW.

The estimated useful life is set at 35 years on average.

The annualization is performed using a capital recovery factor, where "n" is the number of annuities received, equalling the estimated useful life of assets in operation and "*i*" stands for the projected weighted average cost of capital. It is tested at the rate of 5,5 and 7%, within the range of current commercial loans in most Contracting Parties.

$$CR = \frac{i(1+i)^n}{(1+i)^n - 1}$$

The annual costs of operation and maintenance are determined at **4%** of the initial investment per year, to cover maintenance and repair, including labour costs, services, provisions for disposal and dismantling at the end of expected useful life and refurbishment or replacement costs which cannot be capitalized.

The expected annual operational hours range from realistic to optimistic, 6500 to 7500 of full load hours, assuming one month per year for general maintenance and continuous operation during the remainder of the year.

Description	Unit	Parameters and resulting values		
Initial investment	EUR/MW	1.500.000	1.500.000	2.000.000
Average cost of capital	%	5,5%	7,0%	5,5%
Repayment period	years	35	35	35
Capital recovery factor		0,065	0,077	0,065
Annual capital costs	EUR/MW/year	97.462	115.851	129.950
Operation and maintenance (4 % of asset value)	EUR/year	60.000	60.000	80.000
Total annual fixed costs	EUR/year	157.462	175.851	209.950
Full load hours	hours/year	6.500	7.000	7.500
Fixed costs	**EUR/MWh**	24,22	25,12	28,00

TABLE 18 - ANNUALIZED CAPITAL COSTS OF A NEW COAL-FIRED THERMAL POWER PLANT

Variable costs are determined as costs of fuel, i.e. coal and other charges depending on the volume of production.

Acknowledging the fact that coal mines in most of the Energy Community Contracting Parties are located close to or constitute an integral part of the power plant infrastructure, we compared the prices of coal from typical marketed sub-bituminous coal mines, as published on their respective web pages.[52]

The coal from the mines already in use for power production is marketed at prices in the range of 2,5 to 7 EUR/GJ. Taking into account transportation costs, the price of coal, delivered to thermal power plant, of minimum 3 EUR/GJ is taken as a very prudent assumption.

[51] The exception is KEK where gross value of the property, plant and equipment is around 660 EUR/MW.

[52] The price list of coal mines Breza, Pljevlja, Resavica and Rembas were compared (bulk, pea and nut coal).

A reasonable assumption is that the price for existing lignite and brown coal may be even higher. We assume that concession fees or fees for use of natural resources are already included in that price.

Description	Unit	Value - for different plant's efficiency levels		
costs of coal	EUR/GJ(th)	3,00	3,00	3,00
recalculated costs of coal	EUR/MWh(th)	10,80	10,80	10,80
thermal efficiency of TPP		0,35	0,40	0,30
Costs of fuel	EUR/MWh	30,86	27,00	36,00

TABLE 19 - FUEL COSTS FOR POWER PRODUCTION IN TPP

Not considering other variable costs, fees and charges depending or chargeable on produced electricity, the costs of production are in the range of the following values:

Values in EUR/MWh	Values for different parameters		
Fixed costs	24,22	25,12	28,00
Costs of fuel	30,86	27,00	36,00
Total costs	55,10	52,10	64,00

TABLE 20 - CORE FIXED AND VARIABLE COSTS OF COAL FIRED TPP

The calculations above did not take into account technologies for ash disposal and recycling of by-products, developing non-core activities on reclaimed landfills and similar processes either as cost or revenue. Efficiencies gained from the use of heat or revenues from its sale are also not considered.

Under the assumptions presented above, the price of electricity produced from newly built coal-fired thermal power plants lower than 50 EUR/MWh does not suffice to cover the core costs of capital, material, fuel and labour, and realistically is close to 60 EUR/MWh.

This calculation confirms the findings from the previous sections where actual costs of existing power plants, without including any return on equity, are presented in the range of 40 to 60 EUR/MWh.

4.3 Emissions of CO2 – polluter pays principle

Coal-fired power generation is the main cause of the release of CO2 into the atmosphere. Operational costs of coal-fired power plants should include a levy to cover the emission of CO2. There is a policy of putting a cost on this type of pollution, which is taking two main forms: imposing carbon taxes or taking part in an emission trading scheme (ETS) as a market-based mechanism. Emission trading schemes include trading with emission allowances on organized marketplaces, such as a power exchange.

In the European Union, the price paid for allowance to emit 1 ton of carbon dioxide was dwindling below 10 EUR/ton for years, but from 2018 it is growing and recently exceeded 20 EUR/ton at the European Energy Exchange[53]. It is expected that it will grow further in the future.

A recent World Bank study (State and Trends of Carbon Pricing 2018[54]) shows that economies around the globe are introducing mechanisms to reduce carbon emissions.

It is striking that, unlike all other European countries, the Energy Community Contracting Parties as participants to internal electricity market, have not introduced any kind of carbon pricing mechanism yet (a very small tax was introduced in Ukraine recently).

[53] The traded product is EU Allowances (EUA), which permits the emission of one ton of carbon dioxide equivalent (directive 2003/87/EC https://www.eex.com/en/market-data/environmental-markets/spot-market/european-emission-allowances#!/.

[54] World Bank and Ecofys. 2018. "State and Trends of Carbon Pricing 2018 (May)", by World Bank, Washington, DC. https://openknowledge.worldbank.org/handle/10986/29687.

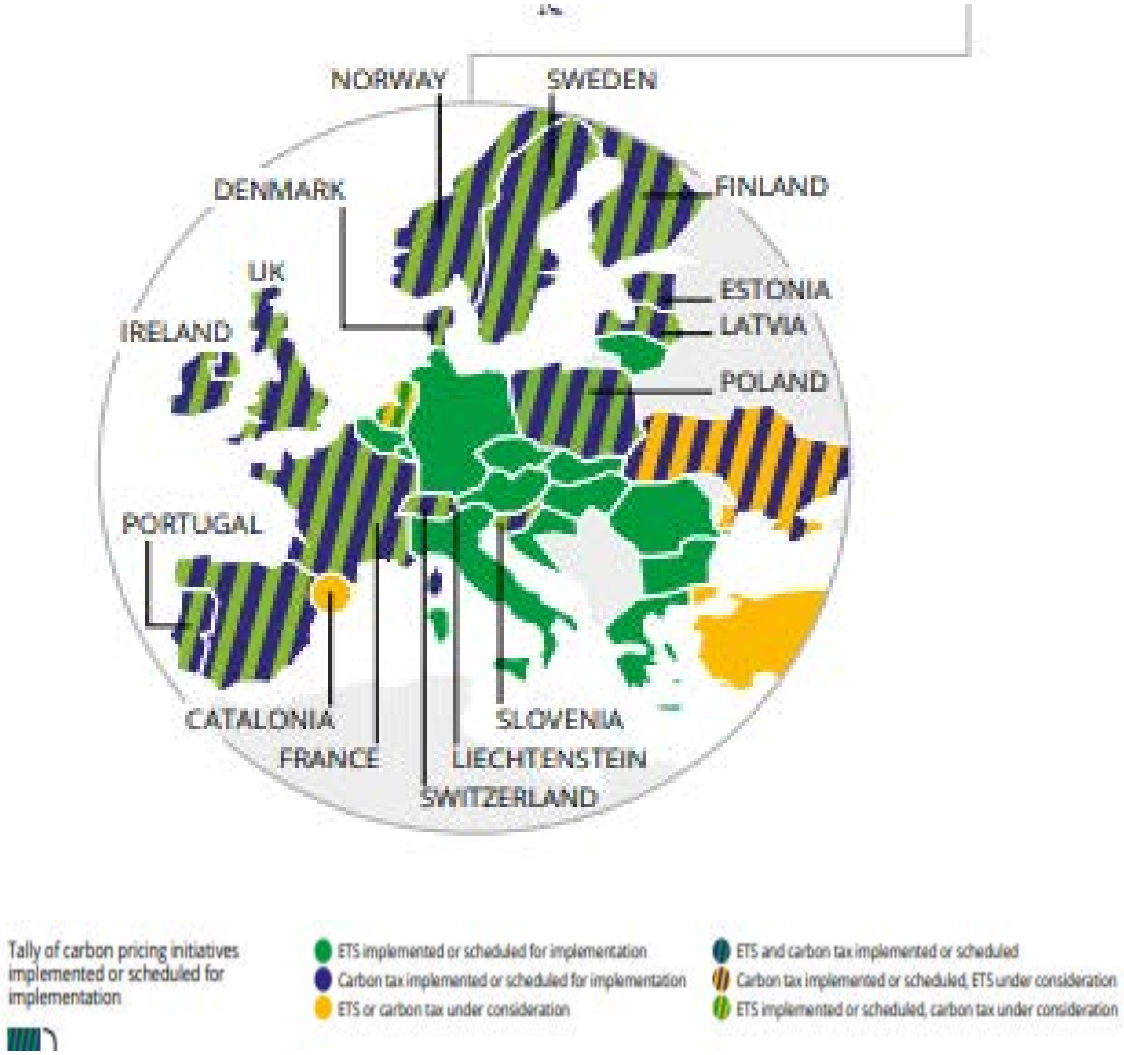


FIGURE 1 - FROM: WORLD BANK GROUP: "STATE AND TRENDS OF CARBON PRICING 2018"

To ensure a level playing field with market participants from economies where a carbon price is paid, the polluters from the Energy Community will have to count on carbon costs as an imminent liability.

Using the available information on production costs of existing power plants which plan to integrate into the EU market, estimated carbon costs were added in the equation.

The default amount of carbon dioxide emitted from power production from lignite and brown coal was calculated by taking into account the CO_2 emissions from lignite and sub-bituminous coal at a default conversion factor, as defined in the Intergovernmental Panel on Climate Change (IPCC) Guideline for GHG inventories, 2006 (Volume 2, ENERGY).[55] The default emission value for brown coal is 96.000 kg/TJ and for lignite 101.000 k/TJ.

The official statistics of the Contracting Parties reveal that the efficiency of coal-fired plants does not exceed 0,35 and in most cases is around 0,30. If the existing plants are planned to continue operation, it is reasonable to assume that efficiency will increase after rehabilitation (to comply with emission requirements), but within the technological limit of around 0,35.

New technologies with efficiency closer to or around 0,40 still do not exist in the Energy Community. The latest investment into a new coal-fired power plant took place in Stanari (Bosnia and Herzegovina) with the plant's thermal efficiency at 0,34.

Based on these assumptions, the CO2 emissions of power plants generating electricity from sub-bituminous coal is determined.

[55] (https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html).

description	unit	brown coal	lignite
default emission factor on energy input	kg/TJ	96.000	101.000
thermal input	TJ (th)	1	1
electricity output	TJ (el)	0,35	0,35
electricity output	GWh (el)	0,0972	0,0972
CO_2 emission on electricity output	**kg/kWh**	**0,99**	**1,04**

TABLE 21 - EMISSION OF CARBON DIOXIDE FROM LIGNITE – DEFAULT VALUES

The emission of carbon dioxide of 1 kg/kWh of electricity generated from coal will be taken for the calculation of costs of CO2 emissions.

Considering the global efforts to reduce CO_2 emissions and the increasing focus on the energy sector, it is inevitable that power producers from the Energy Community will be obliged to pay for their emissions. Contracting Parties have already committed to join the global efforts, and it is only a matter of time when and which measure will be introduced.

The impact of imminent carbon pricing on the viability of existing and future coal-based power production can be easily quantified.

In the following table, the costs of production of electricity from coal-fired thermal power plants are adjusted for carbon cost at a price of 20 EUR/ton CO_2, i.e. the current price of EU CO_2 emission allowances traded at the European Energy Exchange.

Power producer	Produced electricity from coal	**Adjusted costs for subsidies**	**Estimated CO2 costs (20 EUR/ton)**	Adjusted costs with CO2 costs included	**Unit costs of coal fired production with CO2 included**
	GWh	**000 EUR**	**000 EUR**	000 EUR	**EUR/MWh**
[1]	[2]	[4]	**[5]**	[6]=[4]+[5]	**[7]=[6]/[2]**
EPBIH	6.007	317.840	120.145	437.984	**73**
EPCG	1.265	81.839	25.300	107.139	**85**
EPS	24.240	1.008.443	484.800	1.493.243	**62**
KEK	5.726	162.761	114.519	277.280	**48**
ERS	2.871	140.504	57.412	197.916	**69**
ELEM	3.145	167.717	62.902	232.043	**74**
Ukraine	44.457		889.140		

TABLE 22 - COSTS OF PRODUCTION OF ELECTRICITY FROM TPP INCLUDING COSTS OF CO2 EMISSION

Recalling the reservations to the numbers disclosed in the financial reports, the cost of electricity from coal-fired plants can be calculated relying on the costs of production from new plants, as shown in Table 20 above.

Recalling that the average price of band energy traded in HUPEX in 2017 was 42 EUR/MWh and that the prices of electricity traded on SEEPEX are similar, it is obvious that coal-fired thermal power plants can hardly earn a profit. With the elimination of state aid via coal subsidies and introduction of a carbon price, not a single plant will be able to operate without losses.

4.4 Loss making state-owned enterprises

Although the wholesale market is open for competition in most Contracting Parties, the prices which power producers charge in their respective domestic markets and/or to related suppliers are not market based.

The revenues incurred from power generation (based on the audited financial reports for the year 2017) are shown in the following table:

Utility	Plant type	Produced electricity	Revenues from sale of electricity	**Average achieved sale price**	Reported profit/ loss from operation
		GWh	000 EUR	**EUR/MWh**	000 EUR
[1]	[2]	[3]	[4]	**[5]=[4]/[3]**	[6]
EPBIH	coal	6.007			-12.506
	hydro&	941	273.156	**39,31**	
ERS	coal	2.871	111.587	**38,87**	-1.158
	hydro&	1.575	24.829	**15,76**	-17.683
EPCG	coal	1.265			-22.381
	hydro&	976	83.534	**37,27**	
EPS	coal	24.240			81.548
	hydro&	9.764	1.199.750	**35,28**	
ELEM	coal	3.145			9.974
	hydro&	935	186.528	**45,72**	
KEK	coal	5.726	157.389		26.708
	hydro&			**27,49**	
Ukraine		44.457			
		97.768			

TABLE 23 - REVENUES FROM SALE OF ELECTRICITY AND AVERAGE PRICE

Coal power producers in Bosnia and Herzegovina and Montenegro made operational losses in 2017, whereas all other utilities reached positive results from regular operation.

However, when the assessed direct and indirect subsidies are eliminated and the full cost of production is taken into account, the results are strikingly different.

The cost of electricity production in 2017 in the incumbent utilities, adjusted for subsidies and carbon price as shown in Table 22 above for coal-based production and actual costs of HPP production, are presented in the table below:

Power producers	Produced electricity total	Reported OPEX	Coal subsidies	Carbon costs	Adjusted costs of production	
	MWh	000 EUR	000 EUR	000 EUR	EUR	EUR/MWh
[1]	[2]	[3]	[4]	[4]	[5]=[3]+[4]+[5]	[6]=[5]/[2]
EPBIH	6.949	333.267	13.012	120.145	466.424	67
ERS	4.446	176.883	10.310	57.412	244.606	55
EPHZHB	2.055	60.285	0	0	60.285	29
EPCG	2.241	110.963	850	25.300	137.113	61
EPS	34.004	1.256.455	49.942	484.800	1.791.197	53
KEK	5.726	148.391	14.370	114.519	277.280	48
ELEM	4.080	198.040	2.930	62.902	263.872	65
Ukraine	142.225	n/a	193.490	889.140	n/a	

TABLE 24 – THE TOTAL COSTS OF PRODUCTION IN UTILITIES, ADJUSTED FOR ADDITIONAL COSTS OF COAL

When full costs of coal are recognized and taken into account, the price of electricity in the utilities observed compared with the selling price in the respective market in the same year (2017) results in the following difference:

Power producer	Total produced electricity 2017	**Adjusted costs of production of utility**	Achieved average selling price 2017	Difference between selling price and full cost of production	Implicit losses
	GWh	**EUR/MWh**	EUR/MWh	EUR/MWh	000 EUR
[1]	[2]	[3]	[4]	**[5]=[4]-[3]**	[6]=[5]*[2]
EPBIH	6.949	67	39	**-28**	-193.283
ERS	4.446	55	31	**-24**	-108.207
EPCG	2.241	61	37	**-24**	-53.579
EPS	34.004	53	35	**-17**	-591.536
KEK	5.726	48	27	**-21**	-119.874
ELEM	4.080	65	46	**-19**	-77.334
Ukraine	142.225	**n/a**			

TABLE 25 - DIFFERENCE BETWEEN SELLING PRICE OF PRODUCED ELECTRICITY AND COST PER UNIT

If all relevant costs had been taken into account, all utilities with coal-fired thermal power plants would have incurred losses from operation in 2017. The implicit losses are not recognized because of present direct and hidden subsidies for production of electricity from coal.

This scale of losses is incurred only to maintain dominance and low prices in the domestic market. Sound economic reasoning for such policy is still not clear.

At the same time, state-owned utilities are missing the opportunity to earn a profit from the capital invested in the equity of power producers. This lost opportunity for the state budget is not considered at all.

Should the governments have earned a profit equal to the yield on state bonds, assumed at 3% on average, the required revenues from operation would need to be increased by tens or even hundreds of millions of euros. However, neglecting to consider other opportunities to use this capital, state resources are blocked in the power production sector, earning losses or achieving a profit/or result below the amount of interest on state bonds.

The return on equity in power production dominated by coal may be estimated in the following table:

000 EUR / Utility	long term assets	Equity	Imputed return at rate r=3%	Achieved profit/loss	Forgone return
[1]	[2]	[3]	[4]=[3]*r	[5]	[6]=[4]-[5]
EPBIH	1.557.885	1.528.503	45.855	-12.506	58.361
EPCG	891.613	990.002	29.700	-22.381	52.081
EPS	7.711.190	5.704.323	171.130	81.548	89.582
KEK[56]	284.163	122.868	3.686	23.826	-20.140
ERS TE	522.949	440.009	13.200	-1.158	14.358
ELEM TE	655.354	575.113	17.253	9.974	7.279

[56] As noted, valuation of assets and associated costs are not comparable with those other producers.

TABLE 26 - FOREGONE RETURN OF STATE OWNED POWER PLANTS

The power producers observed, mostly state owned, are missing the opportunity to sell at the market price and earn profit from it. The foregone return on assets can be incorporated in the calculation as cost of capital.

Full cost recovery should include incurred operating and financial expenses as well as direct and hidden subsidies (forgone return on equity and pollution charges).

If coal subsidies were not transferred, state capital was fairly priced and emissions were charged, the cost of power production borne by the incumbent operators in the Contracting Parties, with the existing fuel mix, would be the following:

Power producers	Estimated cost for utility	**plant type**	**operating expenses**	**financial expenses**	**coal subsidies**	**carbon costs**	**return on equity**[57]	**Estimated costs of production per plant type**
EPBIH	**72**	coal	50,39	0,35	2,17	20,00	3,98	77
		hydro&	30,00	0,21			11,12	41
ERS	**64**	coal	44,75	0,60	3,59	20,00	4,60	74
		hydro&	28,80	0,83			17,06	47
EPHZHB	**34**	coal						0
		hydro&	29,12	0,22			4,78	34
Incumbents BIH	**61**	coal	48,57	0,43	2,63	20,00	2,44	74
		hydro&	29,19	0,43			5,68	35
EPCG	**74**	coal	62,55	1,47	0,67	20,00	6,04	91
		hydro&	30,00	0,70			22,60	53
EPS	**58**	coal	38,87	0,67	2,06	20,00	3,89	65
		hydro&	30,00	0,52			7,87	38
KEK	**49**	coal	25,41	0,50	2,51	20,00	0,64	49
		hydro&						
ELEM	**69**	coal	50,15	2,24	0,93	20,00	3,28	77
		hydro&	34,05				7,44	41
Ukraine			n/a	n/a	4,35	20	n/a	24

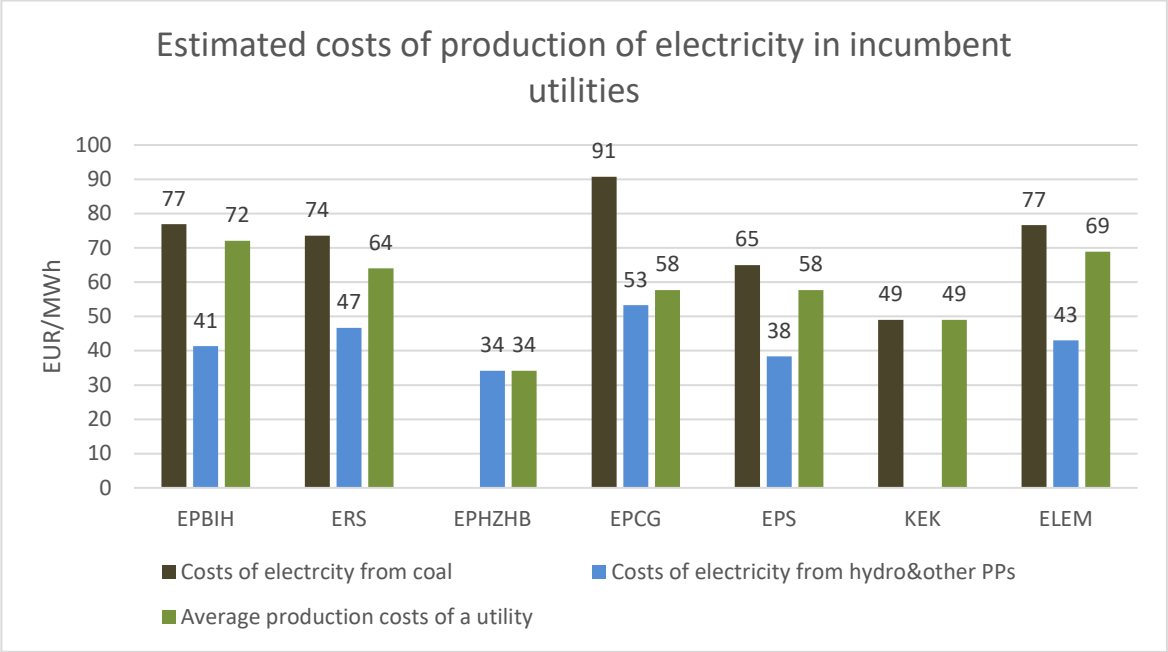
TABLE 27 – ESTIMATED FULL COSTS OF ELECTRICITY IN INCUMBENT UTILITIES PER UNIT OF PRODUCTION (EUR/MWH)

The direct result of state intervention in the operational costs of the market participants provides them with a comparative advantage. Behaviour based on the price signal, which should be the result of properly addressed and recognized costs, is also distorted.

On the other hand, the subsidized producers are implicitly or explicitly in charge of maintaining low prices for selected customer categories and social protection schemes.

On top of that, cross-subsidization between customer categories further distorts the recognition and allocation of full costs to the cost drivers.

[57] Return on equity for EPBiH and EPHZHB is allocated to distribution activity (25%) and the remaining 75% to coal fired TPPs proportionally to the installed TPP capacity in total installed capacity.



GRAPH 4 - ESTIMATED FULL COSTS OF PRODUCTION OF ELECTRICITY IN WESTERN BALKAN COUNTRIES

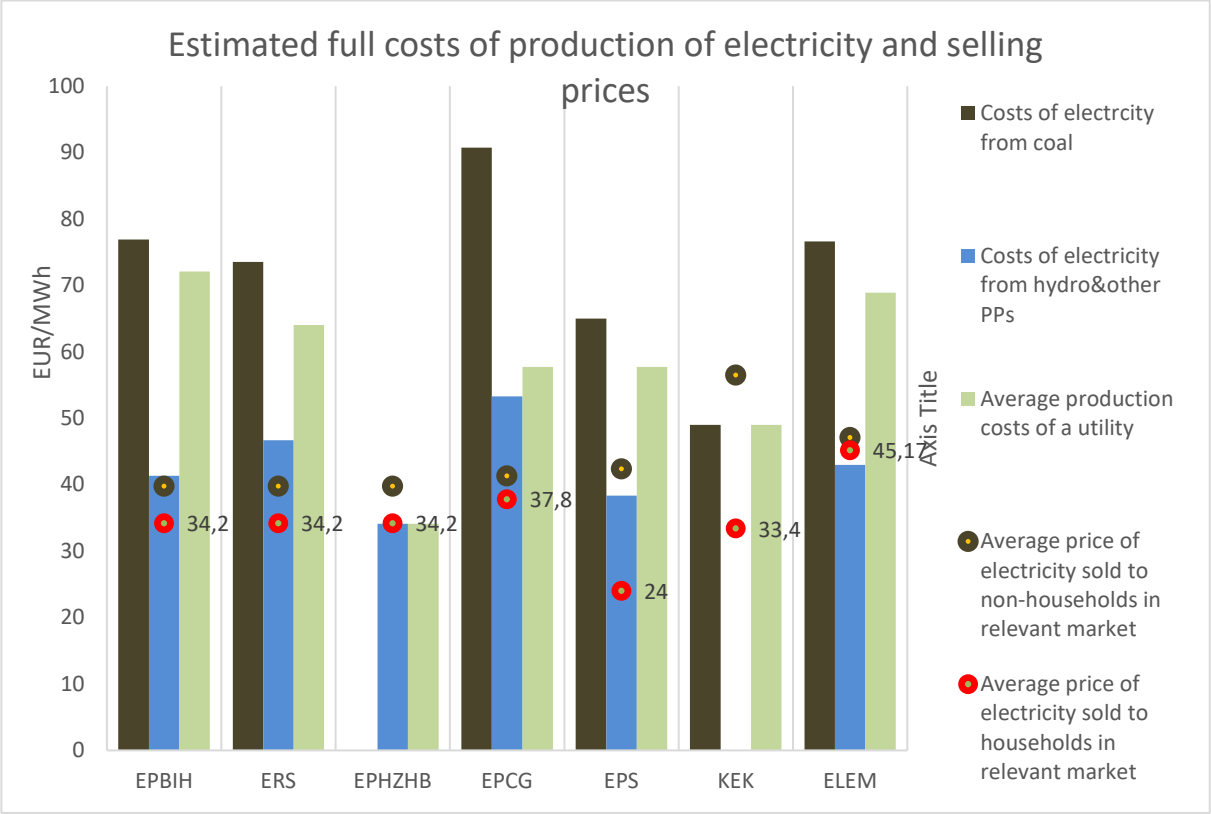
5 Impact of transferring the full cost of coal on end-user prices

The prices of electricity charged to industry and households differ significantly. The prices charged to households, mainly under the regime of universal service, are not only lower than prices charged to industry, they are also lower than the mere operating expenses per unit.

The cost calculation below shows the impact of direct and indirect subsidization of coal power production and CO2 emissions charges on end-user prices.

If all domestic demand would be supplied from indigenous generation, the wholesale prices of electricity fed into the transmission network would on average have to be equal or higher than those shown in the Table 28.

The energy component of end-user prices charged in 2017 to households and industry, respectively, reported to and published by EUROSTAT is compared with the actual costs of electricity adjusted to reflect all direct and hidden subsidies to generation, network costs, charges and levies.



GRAPH 5 – ESTIMATED COSTS OF ELECTRICITY PRODUCED IN INCUMBENT UTILITIES AND PRICES CHARGED TO END USERS IN THEIR RESPECTIVE MARKETS

As the chart shows, there is a clear indication of cross-subsidization between industry and households in most Contracting Parties. This is a legacy from the time of full price regulation, when households were subsidized at the expense of industry.

If incumbent power producers would sell their electricity at the same price to all customer categories, at the cost of production, with all costs fairly recognized, including direct and analysed indirect subsidies to coal, the price increase in percentage terms would follow as shown in the Table 28:

Contracting Party	Energy component in the end user price charged to		Adjusted production costs	Increase of energy component in the price charged to	
	household	industry		household	industry
	EUR/MWh		EUR/MWh	%	%
Bosnia and Herzegovina	34,20	39,80	60,89	78%	53%
Montenegro	37,80	41,30	74,43	97%	80%
North Macedonia	45,17	47,10	68,90	53%	46%
Kosovo*	33,40	56,50	49,00	47%	-13%
Serbia	24,00	42,40	57,71	140%	36%
Ukraine					

TABLE 28 – PRODUCTION COSTS AND AVERAGE PRICE OF ELECTRICITY SOLD FOR FINAL CONSUMPTION

The prices above do not include network costs nor any other charges and levies included in the end-user price.

Market opening for industrial and commercial customers will inevitably lead to the elimination of existing cross-subsidies between sectors.

The change to the final end-user price, including network costs, fees and duties, and electricity at adjusted costs of production from incumbent power producers in the Contracting Parties are presented in the following tables.

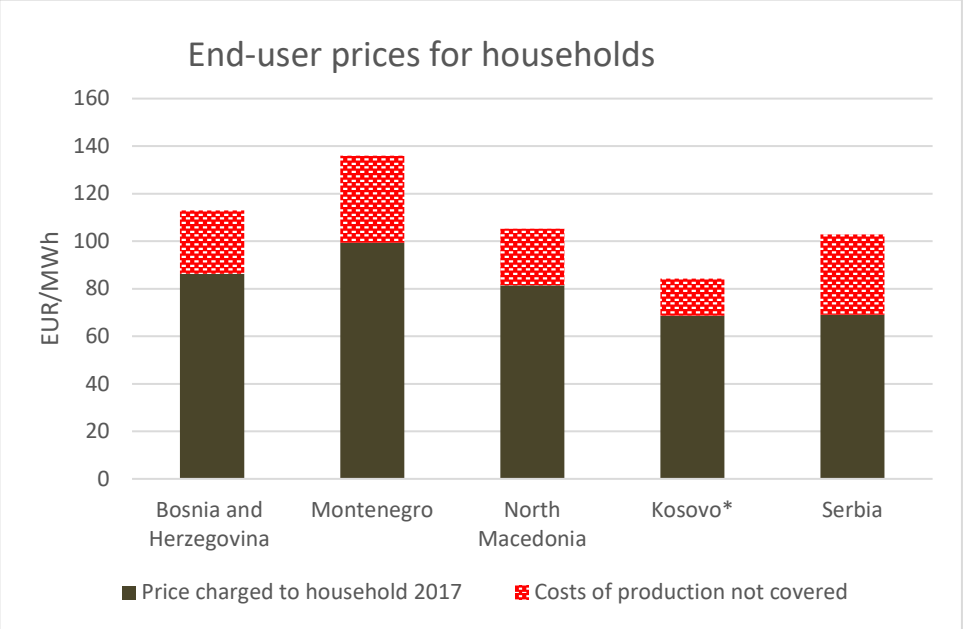
The impact was calculated with the assumption that cross-subsidization between industry and households will be eliminated and the energy component would be charged at the same price to all customer categories.

End-user prices charged to households, band DC consuming between 2500 and 5000 kWh annually:

Contracting Party	Final price charged to household 2017	**Production costs not covered**	Adjusted final price for household	Expected price increase
	EUR/MWh	EUR/MWh	EUR/MWh	%
Bosnia and Herzegovina	86,3	**26,69**	112,99	31%
Montenegro	99,4	**36,63**	136,03	37%
North Macedonia	81,5	**23,73**	105,23	29%
Kosovo*	68,6	**15,60**	84,20	23%
Serbia	69,1	**33,71**	102,81	49%
Ukraine				

TABLE 29 - INCREASE OF END USER PRICES FOR HOUSEHOLDS AFTER RECOGNITION OF FULL COSTS OF COAL (BAND DC)

Direct and hidden subsidies in the overall costs of energy supplied to household customers have yet to be recognized. Their share is depicted in the following graph:



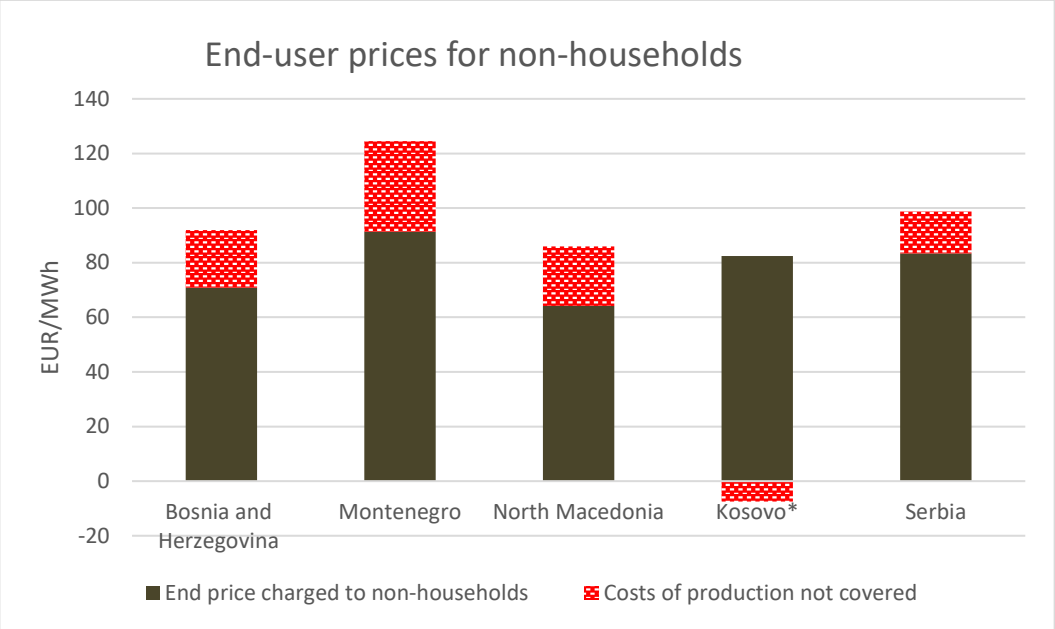
GRAPH 6 - INCREASE OF END USER PRICE FOR HOUSEHOLDS TO COVER FULL COSTS OF COAL

End-user prices charged to non-household customers, band IC consuming between 500 and 1999 MWh annually, would change less, due to the elimination of cross-subsidies.

Contracting Party	End price charged to industry (Band IC)	Costs of production not covered	Adjusted final price for industry	**Expected price increase**
	EUR/MWh	EUR/MWh	EUR/MWh	%
Bosnia and Herzegovina	70,8	**21,09**	91,89	30%
Montenegro	91,4	**33,13**	124,53	36%
North Macedonia	64,1	**21,80**	85,90	34%
Kosovo*	82,5	**-7,50**	75,00	-9%
Serbia	83,4	**15,31**	98,71	18%
Ukraine				

TABLE 30 – INCREASE OF FINAL PRICES FOR INDUSTRIAL CUSTOMERS AFTER RECOGNITION OF FULL COSTS OF COAL

When cross-subsidies between customer categories are eliminated, the final prices for industrial customers in Kosovo* will decrease. In all other Contracting Parties, the prices for households and for industry will have to go up.



GRAPH 7 - NECESSARY INCREASE OF FINAL PRICES FOR INDUSTRY TO COVER FULL COSTS OF COAL

6. Conclusion

This study has shown that all Energy Community Contracting Parties that produce electricity from coal provide, apart from indirect subsidies through the absence of relevant carbon pricing and foregone return on employed capital, also direct subsidies in some form.

Direct subsidies are provided through direct budget subsidies (fiscal support) mainly in the form of direct budget transfers, and by tolerating non-payment of tax and other liabilities to the state, and by reprogramming such liabilities. In this period, only North Macedonia did not provide subsidies for electricity generation from coal in the form of measures that can be classified as fiscal support. In most cases, the direct fiscal support measures were channelled as support to coal production, rather than to thermal power plants as the producers of power.

As electricity generation is a capital-intensive sector and in the Contracting Parties covered by the study is mainly performed by state-owned thermal power plants, with coal mining in state-owned mines (with the exception of Ukraine), the greatest public finance support is provided in the form of loans from state-controlled institutions and state loan guarantees. Serbia is the leader in the use of such instruments. Within the period considered by the study (2015-2017), it supported electricity generation from coal through public finance with an outstanding portfolio of issued loans and guarantees that exceeds EUR 1.3 billion.

In the Contracting Parties where some coal mines operate as independent businesses (Bosnia and Herzegovina, Serbia, Ukraine and Montenegro), it was possible to identify subsidies that are classified as SOE investments support. This type of subsidy mainly relates to state-owned electric power companies providing constant advance payments for coal production, investments into the capital of the mines, toleration of the mines' unpaid electricity bills and loans to support coal production. As the majority of coal mines and thermal power plants in nearly every Contracting Party are mostly integrated in a single electric power company, this study could not determine whether there were coal production subsidies within such operationally and financially integrated systems. It is logical to assume that coal production is subsidized also in the integrated systems at the expense of overall financial performance.

An overview of the study's findings by types of direct subsidy is provided below.

in EUR million

Contracting Party	**Fiscal support subsidies**	Public finance support subsidies	SOE investment support subsidies	TOTAL
Bosnia and Herzegovina	11,50	3,83	26,22	41,55
Kosovo*	22,12	0,13	0,00	22,26
North Macedonia	0,00	3,68	0,00	3,68
Montenegro	0,49	0,45	0,01	0,96
Serbia	59,77	38,95	1,06	99,78
Ukraine	183,87	0,00	62,33	246,19
TOTAL	**277,74**	47,05	89,62	414,41

TABLE 31 - ANNUAL DIRECT SUBSIDIES BY CATEGORY OF SUBSIDIES IN YEARS 2015-2017

The findings of the study show that the existing electricity generation from coal receives significant subsidies through the system of direct subsidies, which disrupts the relations in the electricity market, favours production and obscures real financial and economic performance of the electric power system in the coal sector.

In addition, in the case of some **Contracting Parties**, in view of the state of public finances, the level of national debt, practice of deficit budget financing and exposure arising from issued state guarantees, it is even questionable whether they can count on securing the needed financing for all their plans in the sector of electricity generation from coal. The fact that many international financial institutions no longer support investment in the construction of new or replacement of the existing thermal power plant capacities, also needs to be taken into account.

This study also analysed two types of indirect subsidies: the non-payment of CO2 emissions in comparison to EU Member States and the forgoing of profit of state-owned electricity incumbents (compared to 3% of rate of return on state bonds). The calculation below shows that only these two hidden subsidies sum up to EUR 1955 million as calculated in the generation data in 2017, as presented in Table 31.

Power producers	Carbon costs	Forgone return	Hidden subsidies
	000 EUR	000 EUR	000 EUR
[1]	[2]	[3]	[4]=[2]+[3]
EPBIH	120.145	58.361	178.506
ERS	57.412	14.358	71.770
EPCG	25.300	52.081	77.381
EPS	484.800	89.582	574.382
KEK	114.519	-20.140	94.379[58]
ELEM	62.902	7.279	70.181
UKR	889.140	n/a	889.140
	1.754.218	201.521	1.955.739

TABLE 32 - ESTIMATE OF HIDDEN SUBSIDIES IN PRODUCTION OF ELECTRICITY

In light of these considerations, it is necessary that the Contracting Parties of the Energy Community re-examine their existing policies in the sector of electricity generation from coal, adjust their policies and measures to comply with state aid rules and other obligations under the Energy Community Treaty, develop plans to eliminate subsidies from the sector and embark on a process of genuine restructuring, consolidation and potentially closure of some entities or this sector as a whole.

Coal is becoming an obstacle for the Energy Community Contracting Parties on their path towards EU accession. This study aims to trigger a wide-reaching and all-encompassing stakeholder discussion based on reliable data in order to start changing mind-sets and trigger a change in policy-making. Like the EU, the Contracting Parties should define their 2050 low carbon strategies with net-zero greenhouse gas emissions. They should rapidly remove direct subsidies, request normal market behaviour from their electricity incumbents, establish carbon pricing and ensure compliance with emission limits for coal power plants set by Energy Community legislation. Otherwise, the widening energy policy gap will move the Contracting Parties, especially those in the Western Balkan region, not closer to the EU, but further away.

[58] Assets related costs not comparable with other producers.

6 ANNEXES

Annex 1. **Overview of Direct Subsidies per Contracting Party and Types of Subsidies**

Annex 1.1. Bosnia and Herzegovina – Detailed list of subsidy measures

Measure or project (written description)	Source of subsidy (entity / institution name	Subsidy	Beneficiary	In BAM million				EUR million				Source of data
				2015	2016	2017	Average 2015-2017	2015	2016	2017	Average 2015-2017	
Taxes and contributions in arrears - coal mines in Federation BiH	Government / FBiH Tax Administration	Tax breaks	State coal mines	301.55	376.02	437.11	371.56	154.18	192.26	223.49	189.98	Official data provided by FBiH Tax Administration dated 30.09.2018
VAT in arrears - coal mines in FBiH	Government / BiH Indirect Tax Administration	Tax breaks	State coal mines	0.62	1.68	24.23	8.84	0.32	0.86	12.39	4.52	Official data provided by BiH Indirect Tax Administration dated 13.08.2018
Change of Law - fees for the use of natural resources for the production of electricity[59]	RS Government/RS Parliament	Fiscal incentive (lost revenue)	3 coal-fired TPPs in Republic of Srpska	0.00	14.48	14.73	9.74	0.00	7.41	7.53	4.98	http://www.poreskaupravars.org/dokumenti/zakoni/Zakon-o-izmjenama-naknadama-koristenje-prirodnih-resursa-SLGL-15_16.pdf Accessed on 23.10.2018.
TOTAL				**302.17**	**392.19**	**476.07**		**154.50**	**200.52**	**243.41**	**199.48**	

[59] Calculation of lost revenues made by consultant based on legislative amendments

		2015	2016	2017			
Yield on government bonds* (%)		3.88	3.6	2.8			
*Source: BiH Central Bank Report	https://www.cbbh.ba/Content/Archive/36?lang=bs						

Subsidy calculation (outstanding balance of tax and contribution arrears X yield on government bonds)							
	Year	2015	2016	2017	2015	2016	2017
	Currency	BAM million	BAM million	BAM million	EUR million	EUR million	EUR million
Outstanding balance of tax and con. in arrears		302.17	377.70	461.34	154.50	193.12	235.88
Yield on government bonds (%)		3.88	3.6	2.8	3.88	3.6	2.8
Amount of subsidy per year		**11.72**	**13.60**	**12.92**	**5.99**	**6.95**	**6.60**

Fiscal support	**Year**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
Summary of calculated subsidies	**Currency**	BAM million	BAM million	BAM million	EUR million	EUR million	EUR million
Tax and contribution arrears		11.72	13.60	12.92	5.99	6.95	6.60
Lost revenue		0.00	14.48	14.73	0.00	7.41	7.53
Total:		**11.72**	**28.08**	**27.65**	**5.99**	**14.36**	**14.14**

Bosnia and Herzegovina - Public finance support

Measure or project (written description)	Source of subsidy	Subsidy type	Amount (in original currency)	Repayment period and interest rate	Beneficiary	International support	In BAM million				In EUR million			
							2015	2016	2017	Average 2015-2017	2015	2016)	2017	Average 2015-2017
Flue Gas Desulphurization Construction Project for Ugljevik Thermal Power Plant (ODA Loan)[60]	BiH Ministry of Finance	Government Loan	JPY 12,633 million (cca. EUR 93 million)	30 years, 10 years grace period 0.55%	MH EPS	Government of Japan	181.01	181.01	181.01	181.01	93.57	93.57	93.57	93.57
TOTAL OUTSTANDING BALANCE							**181.01**	**181.01**	**181.01**	**181.01**	**93.57**	**93.57**	**93.57**	**93.57**

			2015	2016	2017			
Interest rate on government guaranteed loans (%)			0.55	0.55	0.55			
Interest rate on comparable commercial loans*(%)			5.953	4.463	3.518			

[60] https://www.jica.go.jp/balkan/office/others/ku57pq00001vg97a-att/jica_in_BOSNIA_and_HERZEGOVINA.pdf Downloaded on 29.08.2018

Interest rate differential (%)			5.403	3.913	2.968			
*Source: BiH Central Bank Report	https://www.cbbh.ba/Content/Archive/36?lang=bs							
Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)								
		Year	2015	2016	2017	2015	2016	2017
		Currency	BAM million	BAM million	BAM million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year			183.01	183.01	183.01	93.57	93.57	93.57
Interest rate differential (%)			5.403	3.913	2.968	5.403	3.913	2.968
Amount of subsidy per year			**9.89**	**7.16**	**5.43**	**5.06**	**3.66**	**2.78**

Bosnia and Herzegovina - SOE investment support

Measure or project (written description)	Source of subsidy (entity/ institution, or ministry, if available)	Subsidy type	Beneficiary	In BAM million				EUR million				Source
				2015	2016	2017	Average 2015-2017	2015	2016	2017	Average 2015-	
Investment in coal mines capital base	JP EPBiH d.d.	SOE investment	7 coal mines in FBiH	25.09	44.94	73.16	47.73	12.83	22.98	37.40	24.40	Audit Report JP EPBiH d.d. https://www.epbih.ba/upload/documents/Odvojeni_2017.pdf Downloaded on 22.08.2018
Short-term loans for coal mines	JP EPBiH d.d.	SOE investment	7 coal mines in FBiH	24.08	24.59	18.20	22.29	12.31	12.57	9.31	11.40	Audit Reports JP EPBiH d.d. https://www.epbih.ba/upload/documents/Odvojeni_2017.pdf Downloaded on 22.08.2018
Interest free financing (advance payment)	JP EPBiH d.d.	SOE investment	7 coal mines in FBiH	52.14	65.55	69.84	62.51	26.66	33.51	35.71	31.96	Audit Reports JP EPBiH d.d. https://www.epbih.ba/upload/documents/Odvojeni_2017.pdf Downloaded on 22.08.2018
TOTAL:				**101.31**	**135.08**	**161.19**	**132.53**	**51.80**	**69.06**	**82.42**	**67.76**	

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)							
Short-term loans to coal mines	Year	2015	2016	2017	2015	2016	2017
	Currency	BAM million	BAM million	BAM million	EUR million	EUR million	EUR million

Outstanding loan balance in the previous year			24.08	24.59	18.20	12.31	12.57	9.31
Interest rate differential (%)			4.453	2.963	2.018	4.453	2.963	2.018
Amount of subsidy per year			**1.07**	**0.73**	**0.37**	**0.55**	**0.37**	**0.19**
Subsidy calculation for advance payments to coal mines (amount of advance payment x interest rate on comparable commercial loans*								
Advance payment		Year	2015	2016	2017	2015	2016	2017
		Currency	BAM million	BAM million	BAM million	EUR million	EUR million	EUR million
Outstanding balance of advance payment			52.14	65.55	69.84	26.66	33.51	35.71
Interest rate on comparable commercial loans* (%)			5.953	4.463	3.518	5.953	4.463	3.518
Amount of subsidy per year			**3.10**	**2.93**	**2.46**	**1.59**	**1.50**	**1.26**
SOE investment support -		**Year**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
summary of calculated subsidies		**Currency**	**BAM million**	**BAM million**	**BAM million**	**EUR million**	**EUR million**	**EUR million**
Equity investment			25.09	44.94	73.16	12.83	22.98	37.40
Loans to coal mines			1.07	0.73	0.37	0.55	0.37	0.19
Advance payment			3.10	2.93	2.46	1.59	1.50	1.26
Total:			**29.27**	**48.59**	**75.98**	**14.96**	**24.84**	**38.85**

Annex 1.2 Kosovo* – Detailed list of subsidy measures

Measure or project (written description)	Source of subsidy (entity/institution, or ministry if available)	Subsidy type	Beneficiary	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (EUR million)	Source
Support for KEK operations	Ministry of Finance	Direct budget transfer	KEK	7.22	6.46	5.92	6.53	http://kek-energy.com/kek/raportet-audituara-financiare/ Downloaded on 11.10.2018
Loan from budget (loan 1)[61]	Ministry of Finance	Government loan	KEK	191.95	189.40	182.68	188.01	https://mf.rks-gov.net/desk/inc/media/A3C6FC70-032A-440A-ABBD-3148F7995E37.pdf Downloaded on 14.10.2018
Forgiven accrued interest on governmen t loans	Ministry of Finance	Debt forgiveness	KEK	19.99	0.00	0.00	6.66	http://kek-energy.com/kek/en/financial-audit-reports/ Downloaded on 11.10.2018
TOTAL				**219.16**	**195.86**	**188.60**	**201.21**	

	Loan 1			2015	2016	2017		
	Interest rate on government loans (%)			2.5	2.5	2.5		
	Interest rate on comparable commercial loans* (%)			8.10	7.00	6.40		
	Interest rate differential (%)			5.6	4.5	3.9		

[61] New reprogramming made in 2015. EUR 191.952 million repayment over 18 years, interest rate 2.5%

	Source: Kosovo Central Bank Report		https://bqk-kos.org/?id=102					
	Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)							
	Loan 1		Year	2015	2016	2017		
			Currency	EUR million	EUR million	EUR million		
	Outstanding loan balance in the previous year			191.95	191.95	189.40		
	Interest rate differential (%)			5.6	4.5	3.9		
	Amount of subsidy per year			**10.75**	**8.64**	**7.39**		
	Fiscal support		**Year**	**2015**	**2016**	**2017**		
	Summary of calculated subsidies		**Currency**	**EUR million**	**EUR million**	**EUR million**		
	Direct budget transfer			7.22	6.46	5.92		
	Loan 1			10.75	8.64	7.39		
	Debt forgiveness			19.99	0.00	0.00		

Kosovo* - Public finance support

Measure or project (written description)	Source of subsidy (entity/ institution, or ministry, if available)	Subsidy type	Amount (in original currency)	Repayment and interest period	Beneficiary	International support	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount	Source
Energy Cleanup and Land Reclamation Project	Ministry of Finance	State loan guarantee	2.8 million SDR	20 years, 2%	KEK	WB IDA	2.61	2.61	2.61	2.61	https://mf.rks-gov.net/desk/inc/media/A3C6FC70-032A-440A-ABBD-3148F7995E37.pdf Downloaded on 28.08.2018
TOTAL OUTSTANDING BALANCE							**2.61**	**2.61**	**2.61**	**2.61**	

Loan	2015	2016	2017
Interest rate on government guaranteed loans (%)	2.00	2.00	2.00
Interest rate on comparable commercial loans* (%)	8.10	7.00	6.40
Interest rate differential (%)	6.1	5	4.4
Source: Kosovo Central Bank Report	https://bqk-kos.org/?id=102		

Year	2015	2016	2017

Currency		EUR million	EUR million	EUR million
Loan				
Outstanding loan balance in the previous year		2.61	2.61	2.61
Interest rate differential (%)		6.1	5	4.4
Amount of subsidy per year		**0.16**	**0.13**	**0.11**

Annex 1.3 North Macedonia – Detailed list of subsidy measures

North Macedonia – Public finance support

Measure or project (written description)	Source of subsidy	Subsidy type	Amount (in original currency)	Repayment period and interest rate	Beneficiary	International support	2015 (MKD million)	2016 (MKD million)	2017 (MKD million)	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (MKD million)	Average annual amount (EUR million)	Source
Modernization of boiler units 2 and 3 in TPP Bitola	Ministry of Finance	State loan guarantee	EUR 49.2 million	12 years, 6 month EURIBOR + 1.675%	AD ELEM	Deutsche Bank	2,397.92	2,149.07	1,893.05	39.00	34.89	30.79	2,146.68	34.89	https://www.finance.gov.mk/files/u5/Law_20on_20Guarantee_deutche_bank.pdf Downloaded on 11.09.2018
Modernization of boiler unit 1 in TPP Bitola	Ministry of Finance	State loan guarantee	EUR 24.3 million	12 years, 6 month EURIBOR + 1.295%	AD ELEM	Deutsche Bank	1,371.33	1,248.66	1,121.82	22.30	20.27	18.25	1,247.27	20.27	https://www.finance.gov.mk/files/u5/Law_on_Guarantee.pdf Downloaded on 11.09.2018
Modernization of TPP Bitola	Ministry of Finance	State loan guarantee	EUR 30 million	14 years, EURIBOR + 2%	AD ELEM	Stopanska banka	1,509.33	1,343.77	1,173.73	24.55	21.82	19.09	1,342.28	21.82	https://www.finance.gov.mk/mk/node/1523 Downloaded on 12.09.2018

Delivery, construction and putting into operation of LOT 3 – Main coal conveyor belt system from Brod Geotino to Suvodol	Ministry of Finance	State loan guarantee	EUR 16 million	8.5 years, 6 month EURIBOR + 1.55%	AD ELEM	Deutsche Bank	520.87	405.77	289.32	8.47	6.59	4.71	405.32	6.59	https://www.finance.gov.mk/files/u5/Law_on_guarantee_Dojce_banka_gneotino.pdf Downloaded on 12.09.2018
TOTAL OUTSTANDING BALANCE							**5,799.45**	**5,147.26**	**4,477.92**	**94.31**	**83.57**	**72.83**	**5,141.55**	**83.57**	

Loan 1	2015	2016	2017
Interest rate on government guaranteed loans	1.728	1.51	1.415
EURIBOR**	0.053	-0.165	-0.26
Interest rate	1.675	1.675	1.675
Interest rate on comparable commercial loans*	5.88	5.44	4,9
Interest rate differential	4.152	3,93	3,485
*Source: National Bank	http://www.nbrm.mk/prebaruvanje-en.nspx?q=interest%20rates		
** Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 1	Year	2015	2016	2017	2015	2016	2017
	Currency	MKD million	MKD million	MKD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		2,650.89	2,397.92	2,149.,07	43.11	39.00	34.89
Interest rate differential (%)		4.152	3.93	3.485	4.152	3.93	3.485
Amount of subsidy per year		**110.06**	**94.24**	**74.89**	**1.79**	**1.53**	**1.22**

Loan 2	2015	2016	2017
Interest rate on government guaranteed loans	1.348	1.13	1.035
EURIBOR**	0.053	-0.165	-0,26
Interest rate	1.295	1.295	1,295

Interest rate on comparable commercial loans*	5.88	5.44	4.9
Interest rate differential	4.532	4.31	3.865
*Source: National Bank Report	http://www.nbrm.mk/prebaruvanje-en.nspx?q=interest%20rates		
** Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 2	Year	2015	2016	2017	2015	2016	2017
	Currency	MKD million	MKD million	MKD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		1,496.16	1,371.33	1,248.66	24.33	22.30	20.27
Interest rate differential (%)		4.532	4.31	3.865	4.532	4.31	3.865
Amount of subsidy per year		**67.81**	**59.10**	**48.26**	**1.10**	**0.96**	**0.78**

Loan 3	2015	2016	2017
Interest rate on government guaranteed loans	2.053	1.835	1.74
EURIBOR**	0.053	-0.165	-0.26
Interest rate	2.00	2.00	2.00
Interest rate on comparable commercial loans*	5.88	5.44	4.9
Interest rate differential	3.827	3.605	3.16
*Source: National Bank Report	http://www.nbrm.mk/prebaruvanje-en.nspx?q=interest%20rates		
** Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 3	Year	2015	2016	2017	2015	2016	2017
	Currency	MKD million	MKD million	MKD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		1,677.20	1,509.33	1,343.77	27.28	24.55	21.82
Interest rate differential (%)		3.827	3.605	3.16	3.827	3.605	3.16
Amount of subsidy per year		**64.19**	**54.41**	**42.46**	**1.04**	**0.88**	**0.69**

Loan 4	2015	2016	2017
Interest rate on government guaranteed loans	1.603	1.385	1.29
EURIBOR*	0.053	-0.165	-0.26

Interest rate		1.55	1.55	1.55			
Interest rate on comparable commercial loans**		5.88	5.44	4.9			
Interest rate differential		4.277	4.055	3.61			
*Source: National Bank Report	http://www.nbrm.mk/prebaruvanje-en.nspx?q=interest%20rates						
** Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx						

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 4	Year	2015	2016	2017	2015	2016	2017
	Currency	MKD million	MKD million	MKD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		636.47	520.87	405.77	10.35	8.47	6.59
Interest rate differential (%)		4.277	4.055	3.61	4.277	4.055	3.61
Amount of subsidy per year		**27.22**	**21.12**	**14.65**	**0.44**	**0.34**	**0.24**

Public finance support - Summary of calculated subsidies	**Year**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
	Currency	**MKD million**	**MKD million**	**MKD million**	**EUR million**	**EUR million**	**EUR million**
Loan 1		110.06	94.24	74.89	1.79	1.53	1.22
Loan 2		67.81	59.10	48.26	1.10	0.96	0.78
Loan 3		64.19	54.41	42.46	1.04	0.88	0.69
Loan 4		27.22	21.12	14.65	0.44	0.34	0.24
Total:		**269.28**	**228.88**	**180.27**	**4.38**	**3.72**	**2.93**

Annex 1.4 Montenegro – Detailed list of subsidy measures

Montenegro - Fiscal support								
Measure or project	**Source of subsidy (entity /institution or ministry, if available)**	**Subsidy type**	**Beneficiary**	**2015 (EUR million)**	**2016 (EUR million)**	**2017 (EUR million)**	**Average annual amount (EUR million)**	**Source**
RU Pljevlja[62]	Ministry of Finance/Tax administration	Tax and contributions in arrears	RU Pljevlja	11.03	13.44	9.25	11.24	http://www.rupv.me/sites/rupv.me/files/2016_-_izvjestaj_revizora_za_rudnik_uglja_pv.pdf Downloaded on 07.11..2018
TOTAL				**11.03**	**13.44**	**9.25**	**11.24**	

			2015	2016	2017
Yield on government bonds* (%)			2.4	5.34	5.38
*Source: Montenegro Central Bank Report			http://www.cb-cg.org/index.php?mn1=statistika		
Subsidy calculation (outstanding balance of the tax and contributions in arrears X yield on government bonds)					
		Year	2015	2016	2017
		Currency	EUR million	EUR million	EUR million
Outstanding balance of tax and con. in arrears			11.03	13.44	9.25
Yield on government bonds			2.4	5.34	5.38
Amount of subsidy per year			**0.26**	**0.72**	**0.50**

[62] Reprogramming over 5 years starting in 2017.

Montenegro - Public finance support

Measure or project (written description)	Source of subsidy	Subsidy type	Amount (in original currency)	Repayment period and interest rate	Beneficiary	International support	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (EUR million)	Source
Filter replacement in TE Pljevlja	Ministry of Finance	State loan guarantee	EUR 10 million	9 years 6 months Euribor+1 %	EPCG	KfW	8.20	7.08	5.96	7.08	https://www.epcg.com/sites/epcg.com/files/prilog_1_finansijski_izvjestaji_epcg_sa_misljenjem_revizora-_2016-mne_1.12.2017.pdf Downloaded on 14.11.2018
TOTAL OUTSTANDING BALANCE							**8.20**	**7.08**	**5.96**	**7.08**	

		2015	2016	2017
Interest rate on government guaranteed loans		1.05	0.84	0.74
EURIBOR**		0.053	-0.165	-0,26
Interest rate		1.00	1.00	1.00
Interest rate on comparable commercial loan*		7.24	6.18	5.68
Interest rate differential		6.19	5.35	4.94
*Source: Montenegro Central Bank Report	http://www.cb-cg.org/index.php?mn1=statistika			
**Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx			

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)				
	Year	2015	2016	2017
	Currency	EUR million	EUR million	EUR million

Outstanding loan balance in the previous year	9.32	8.20	7.08
Interest rate differential (%)	6.19	5.35	4.94
Amount of subsidy per year	**0.58**	**0.44**	**0.35**

Montenegro - SOE investment support

Measure or project	Source of subsidy	Subsidy type	Beneficiary	2015 (million EUR)	2016 (million EUR)	2017 (million EUR)	Average annual amount (million EUR)	Source
Pljevlja Coal Mine	EPCG	Electricity debt	RU Pljevlja	0.59	0.00	0.00	0.20	http://www.vijesti.me/vijesti/ovih-50-kompanija-imaju-najveci-dug-za-struju-rudnik-uglja-na-celu-896621 Accessed on 12.08.218.
TOTAL				**0.59**	**0.00**	**0.00**	**0.20**	

Subsidy calculation (outstanding debt x commercial loan interest rate*) 0.59 x 7.24% = **0.04** **EUR million**

**Source: Montenegro Central Bank Report http://www.cb-cg.org/index.php?mn1=publikacije&mn2=godisnji_izvjestaj&mn3=godisnji_izvjestaj_o_radu_cbcg

Annex 1.5 Serbia – Detailed list of subsidy measures

Measure or project (written description)	Source of subsidy	Subsidy type	Beneficiary	2015 (RSD million)	2016 (RSD million)	2017 (RSD million)	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (RSD million)	Average annual amount (EUR million)	Source
Budgetary expenditure for underground coal mines[63]	Government	Direct budget transfer	JP Resavica PEU	2,243.87	2,992.23	2,535.00	19	24	21	2,590.37	21.26	Audit and Company Reports. http://www.jppeu.rs/informator.html Downloaded on 07.09..2018
Taxes, contributions and other public revenues in arrears (underground coal mines)[64]	Tax administration	Taxes and contribution in arrears	JP Resavica PEU	384.84	582.99	345.97	3.19	4.74	2.85	437.93	3.59	Audit and Company Reports. http://www.jppeu.rs/informator.html Downloaded on 07.09..2018
Taxes and contributions in arrears reprogrammed (underground coal mines)[65]	Government / Tax administration	Taxes and contribution in arrears	JP Resavica PEU	2,627.24	2,544.94	2,522.17	21.76	20.67	20.79	2.564.78	21.07	Audit and Company Reports. http://www.jppeu.rs/informator.html Downloaded on 07.09..2018
Budgetary expenditure for filters in TENT	Government	Direct budget transfer	JP EPS Belgrade	0.00	151.10	0.00	0.00	1.23	0.00	50.37	0.41	http://www.eps.rs/SiteAssets/Lists/Sitemap/EditForm/izvestajioposlovanju/finansijski/Finansijski%20izve%c5%a1taji%20za%202016.%20godinu%20i%20Izve%c5%a1taj%20nezavisnog%20revizora/JP%20EPS%20pojedinacni-potpisan.pdf Downloaded on 09.09..2018

[63] Calculated 50% of total amount (50% of total coal production goes to electricity production)

[64] Calculated 50% of total arrears (50% of total coal production goes to electricity production)

[65] Reprogrammed by RS Tax Administration Calculated 50% of arrears (50% of total coal production goes to electricity production)

Partial write-off of government loan (Agreement about old debts SFRY - SSSR, Serbia and Russian Federation)	Government	Debt forgiveness	JP Belgrade EPS	0.00	5,113.30	0.00	0.00	41.53	0.00	1,704.43	13.84	http://www.eps.rs/Documents/JP%20EPS%20izvestaj%202017.pdf Downloaded on 09.09..2018
Loan to JP PEU Resavica from the budget (loan 1)[66]	Government	Government loan	PEU Resavica	0.00	0.00	260.13	0.00	0.00	2.14	86.71	0.71	http://www.jppeu.rs/dokumenti/Izvestaj%20revizora%20i%20set%20redovnih%20finansijskih%20izvestaja%20za%202017.%20godinu.pdf Downloaded on 07.09..2018
Agreement about old debts SFRY - SSSR, Serbia and Russian Federation (loan 2)[67]	Government	Government loan	JP Belgrade EPS	10,519.83	5,406.53	5,406.53	87.13	43.91	44.56	7,110.96	58.53	http://www.eps.rs/Documents/JP%20EPS%20izvestaj%202017.pdf Downloaded on 09.09..2018
TOTAL				**15,775.78**	**16,791.09**	**11,069.80**	**130.66**	**136.38**	**91.23**	**5,643.45**	**46.33**	-

	2015	2016	2017			
Yield on government bonds* (%)	6.95	5.64	4.74			
*Source: Serbian National Bank Report	https://www.nbs.rs/internet/cirilica/33/index.html					

Subsidy calculation (outstanding balance of the tax and contributions in arrears X yield on government bonds)

	Year	2015	2016	2017	2015	2016	201700
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding balance of tax and con. in arrears		3,012.08	3,127.93	2,868.14	24.95	25.41	23.64

[66] Calculated 50% of total amount (50% of total coal production goes to electricity production) no repayment, no interest rate – Conditional loan

[67] 10 years repayment period, interest rate LIBOR+1%

Yield on government bonds		6.95	5.64	4.74	6.95	5.64	4.74
Amount of subsidy per year		**209.34**	**176.41**	**135.95**	**1.73**	**1.43**	**1.12**

Loan 1		2015	2016	2017
Interest rate on government conditional loans		0.00	0.00	0.00
Interest rate on comparable commercial loans*		7.20	6.00	5.50
Interest rate differential		7.20	6.00	5.50
* Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html			

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)							
Loan 1	Year	2015	2016	2017	2015	2016	201700
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		0.00	0.00	260.13	0.00	0.00	2.14
Interest rate differential (%)		7.20	6.00	5.50	7.20	6.00	5.50
Amount of subsidy per year		**0.00**	**0.00**	**14.31**	**0.00**	**0.00**	**0.12**

Loan 2		2015	2016	2017
Interest rate		1.00	1.00	1.00
USD Libor*		0.79	1.38	1.79
Interest rate on government guaranteed loans		1.79	2.38	2..79
Interest rate on comparable commercial loans**		4.30	3.40	3.30
Interest rate differential		2.51	1.02	0.51
* Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx			
** Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html			

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 2	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		10,519.45	10,727.26	5,327.89	87.13	87.13	43.91
Interest rate differential (%)		2.51	1.02	0.51	2.51	1.02	0.51
Amount of subsidy per year		**263.62**	**109.85**	**27.28**	**2.18**	**0.89**	**0.22**

Fiscal support summary of calculated subsidies	**Year Currency**	**2015 RSD million**	**2016 RSD million**	**2017 RSD million**	**2015 EUR million**	**2016 EUR million**	**2017 EUR million**
Budgetary expenditures		2,243.87	2,992.23	2,535.00	18.59	24.30	20.89
Taxes and contributions in arrears		3,012.08	3,127.93	2,868.14	24.95	25.41	23.64
Write-offs		0.00	5113.30	0.00	0.00	41.53	0.00
Government loans		263.62	109.85	41.59	2.18	0.89	0.34
Total:		**5,255.95**	**11,233.46**	**5,403.14**	**43.53**	**91.24**	**44.53**

Serbia - Public finance support

Measure or project (written description)	Source of subsidy	Subsidy type	Amount (in original currency)	Repayment period and interest rate	Beneficiary	International support	2015 (RSD million)	2016 (RSD million)	2017 (RSD million)	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (RSD million)	Average annual amount (EUR million)	Source
Loan to JP PEU Resavica (loan 1)[68]	Deposit Insurance	Loan provided by state institution	EUR 1,851,192	No repayment	JU PEU Resavica	No	111.75	113.96	112.31	0.93	0.93	0.93	112.67	0.93	Audit and Company Reports. http://www.jppeu.rs/informator.html Downloaded on 09.09..2018
Loan to JP PEU Resavica (loan 2)[69]	Deposit Insurance	Loan provided by state institution	EUR 243,990	No repayment	JU PEU Resavica	No	14.73	15.02	14.80	0.24	0.24	0.24	14.85	0.24	Audit and Company Reports. http://www.jppeu.rs/informator.html Downloaded on 07.09..2018
Loan to JP PEU Resavica (loan 3)[70]	Development Fund of Serbia	Loan provided by state institution	RSD 1,988.04 million	No repayment	JU PEU Resavica	No	994.02	994.02	994.02	8.23	8.07	8.19	994.02	8.17	Audit and Company Reports. http://www.jppeu.rs/informator.html Downloaded on 07.09..2018

[68] Calculated 50% of total subsidy (50% of all production goes to electricity production)

[69] Calculated 50% of total subsidy (50% of all production goes to electricity production

[70] Calculated 50% of total subsidy (50% of all production goes to electricity production

"Flue Gas Desulphurization Construction Project for Thermal Power Plant Nikola Tesla A." (loan 4)[71]	Ministry of Finance	State loan guarantee	JPY 28,252 billion (cca. EUR 213 million)	15 years, 0.6%	JP EPS Belgrade	JICA ODA Loan	25716	26224.11	24121.74	213.00	213.00	198.80	25353.98	208.27	https://www.reuters.com/article/us-serbia-energy-cleanup/serbias-largest-power-plant-to-start-clean-up-to-meet-eu-standards-idUSKCN1BJ1ZI
Flue Gas Desulphurization Construction Project for Thermal Power Plant Kostolac B (loan 5)	Ministry of Finance	State loan guarantee	USD 130.5 million (cca. EUR 157 million)	15 years, 3%	JP EPS Belgrade	China Exim Bank	18955	19329.51	17144.88	157.00	157.00	141.30	18476.48	151.77	http://www.eps.rs/SiteAssets/Lists/Sitemap/EditForm/izvestajioposlovanju/godisnjiizvestaji/Godisnji%20izvestaj%202015_%20srpski.pdf Downloaded on 09.09..2018
Kolubara project A - design, production and installation of the BTO system for the future surface kop Field C (loan 6)	Ministry of Finance	State Loan guarantee	EUR 80 million	8.5 years, EURIBOR + 1%	JP EPS Belgrade	EBRD	8522.32	7531.92	6280.96	70.59	61.18	51.76	7445.06	61.18	http://www.eps.rs/SiteAssets/Lists/Sitemap/EditForm/izvestajioposlovanju/godisnjiizvestaji/Godisnji%20izvestaj%202015_%20srpski.pdf Downloaded on 09.09..2018
EPS Restructuring project (refinancing of existing loans in commercial banks 2015) (loan 7)	Ministry of Finance	State guarantee Loan	EUR 200 million	15 years, EURIBOR +1	JP EPS Belgrade	EBRD	24146.56	24623.58	23368.55	200.00	200.00	192.59	24046.23	197.53	http://www.eps.rs/Documents/JP%20EPS%20izvestaj%202017.pdf Downloaded on 09.09..2018

[71] https://www.jica.go.jp/balkan/english/office/others/c8h0vm0000bfpaeh-att/jica_serbia.pdf Downloaded on 11.09..2018

Kolubara project B and C - Interlayer stacker for Tamnava West Field and coal quality management system for Tamnava surface mine (loan 8)	Ministry of Finance	State loan guarantee	EUR 65 million	7.5 years 1.75%	JP EPS Belgrade	KfW	7847.63	8002.66	7361.09	65.00	65.00	60.67	7737.13	63.56	http://www.eps.rs/Documents/JP%20EPS%20izvestaj%202017.pdf Downloaded on 09.09..2018
Emergency flood recovery project (loan 9)	**Ministry of Finance**	**State loan guarantee**	**EUR 157.11 million**	**21 years 6 months EURIBOR**	**JP EPS Belgrade**	**IBRD**	**18968.33**	**19343.05**	**19063.21**	**157.11**	**157.11**	**157.11**	**19124.86**	**157.11**	**http://www.eps.rs/Documents/JP%20EPS%20izvestaj%202017.pdf Downloaded on 09.09..2018**
TENT A modernization and ash transportation system (loan 10)	Ministry of Finance	State loan guarantee	EUR 45 million	12 years 5 years grace	JP EPS Belgrade	KfW	0.00	0.00	5460.15	0.00	0.00	45.00	1820.05	15.00	http://www.eps.rs/Documents/JP%20EPS%20izvestaj%202017.pdf Downloaded on 09.09..2018
Kostolac B second phase Drmno open pit mine and 350 MW unit at Kostolac B (loan 11)	Ministry of Finance	State loan guarantee	USD 608 million (cca EUR 529 million)	20 years 2.5%	JP EPS Belgrade	China Exim Bank	63867.65	65129.37	64187.11	529.00	529.00	529.00	64394.71	529.00	http://www.eps.rs/SiteAssets/Lists/Sitemap/EditForm/izvestajioposlovanju/godisnjiizvestaji/Godisnji%20izvestaj%202015_%20srpski.pdf Downloaded on 09.09..2018
Construction of a waste water purification plant in TENT A	EU	Grant	EUR 6 million	-	JP EPS Belgrade	EU	724.40	0	0	6.00	0.00	0.00	241.47	2.00	http://www.eps.rs/SiteAssets/Lists/Sitemap/EditForm/izvestajioposlovanju/godisnjiizvestaji/Godisnji%20izvestaj%202015_%20srpski.pdf Downloaded on 09.09..2018

Kolubara project B and C - Interlayer stacker for Tamnava West Field and coal quality management system for Tamnava surface mine	KfW	Grant	EUR 9 million	-	JP EPS Belgrade	KfW	1086.60	0	0	9.00	0.00	0.00	362.20	3.00	http://www.eps.rs/SiteAssets/Lists/Sitemap/EditForm/izvestajioposlovanju/godisnjiizvestaji/Godisnji%20izvestaj%202015_%20srpski.pdf Downloaded on 09.09..2018
NOx emission reduction at the TPP Nikola Tesla unit 4	EU IPA 2	Grant	EUR 8.59 million	-	JP EPS Belgrade	EU	0.00	0.00	1.042.28	0.00	0.00	8.59	347.43	2.86	http://www.cfcu.gov.rs/dokumenti/sr/331601196_contract-award-notice.pdf Downloaded on 11.09..2018
Supervision of works NO x emission reduction at the TPP Nikola Tesla unit 4	EU IPA 2	Grant	EUR 0.7 million	-	JP EPS Belgrade	EU	0	0	84.65	0.00	0.00	0.70	28.22	0.23	http://www.cfcu.gov.rs/dokumenti/sr/330678127_can.pdf Downloaded on 11.09..2018
Construction and commissioning of the industrial wastewater treatment facility in TPP Kosotlac B	EU IPA	Grant	EUR 5.44 million	-	JP EPS Belgrade	EU	0.00	0	660.05	0.00	0.00	5.44	220.02	1.81	http://www.cfcu.gov.rs/tenderi.php?rec=0&status=0&komponenta=0&tip=0&program=0&godina=0&num=41 Downloaded on 11.09..2018
Emergency flood recovery grant for Kolubara	EU Solidarity Fund	Grant	EUR 3.59 million	-	JP EPS Belgrade	EU	0.00	442.05	0.00	0.00	3.59	0.00	147.35	1.20	http://www.eps.rs/SiteAssets/Lists/Sitemap/EditForm/izvestajioposlovanju/finansijski/Finansijski%20izve%c5%a1taji%20za%202016.%20godinu%20i%20Izve%c5%a1taj%20nezavisnog%20revizora/JP%20EPS%20pojedinacni-potpisan.pdf Downloaded on 09.09..2018

Supervision of construction and commissioning of the industrial wastewater treatment facility in TPP Kosotlac B	EU IPA	Grant	EUR 0.51 million	-	JP EPS Belgrade	EU	0.00	0	61.52	0.00	0.00	0.51	20.51	0.17	http://www.cfcu.gov.rs/dokumenti/sr/100355620_can-kostolac.pdf Downloaded on 09.09..2018_
TOTAL OUTSTANDING BALANCE							**170955.12**	**171749.25**	**169957.32**	**1416.10**	**1395.12**	**1400.83**	**170887.23**	**1404.02**	

Loan 1	2015	2016	2017
Interest rate on government conditional loans	0	0	0
Interest rate on comparable commercial loans*	7.2	6.00	5.5
Interest rate differential	7.2	6.00	5.5

* Source: National Bank of Serbia https://www.nbs.rs/internet/cirilica/90/mp.html

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 1	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		111.75	113.96	112.31	0.93	0.93	0.93
Interest rate differential (%)		7.2	6.00	5.5	7.2	6	5.5
Amount of subsidy per year		**8.05**	**6.84**	**6.18**	**0.07**	**0.06**	**0.05**

Loan 2	**2015**	**2016**	**2017**
Interest rate on government conditional loans	**0**	**0**	**0**
Interest rate on comparable commercial loans*	**7.2**	**6.00**	**5.5**
Interest rate differential	**7.2**	**6.00**	**5.5**

* Source: National Bank of Serbia https://www.nbs.rs/internet/cirilica/90/mp.html

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 2	Year	2015	2016	2017	2015	2016	2017

	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		14.73	15.02	14.80	0.24	0.24	0.24
Interest rate differential (%)		7.2	6.00	5.5	7.2	6	5.5
Amount of subsidy per year		**1.06**	**0.90**	**0.81**	**0.02**	**0.01**	**0.01**

Loan 3	2015	2016	2017
Interest rate on the government's conditional loans	0	0	0
Interest rate on comparable commercial loans*	7.2	6.00	5.5
Interest rate differential	7.2	6.00	5.5
* Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 3	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		994.02	994.02	994.02	8.23	8.07	8.07
Interest rate differential (%)		7.2	6.00	5.5	7.2	6	5.5
Amount of subsidy per year		**71.57**	**59.64**	**54.67**	**0.59**	**0.48**	**0.44**

Loan 4	2015	2016	2017
Interest rate on government guaranteed loans	0.6	0.6	0.6
Interest rate on comparable commercial loans*	4.3	3.40	3.3
Interest rate differential	3.7	2.80	2.7
* Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 4	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		25716.09	26224.11	25844.72	213.00	213.00	213.00

Interest rate differential (%)	3.7	2.80	2.7	3.7	2.8	2.7
Amount of subsidy per year	**951.50**	**734.28**	**697.81**	**7.88**	**5.96**	**5.75**

Loan 5	2015	2016	2017
Interest rate on government guaranteed loans	3.00	3.00	3.00
Interest rate on comparable commercial loans*	4.3	3.40	3.3
Interest rate differential	1.3	0.40	0.3
* Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 5	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		18955.05	19329.51	19049.86	157.00	157.00	15700
Interest rate differential (%)		1.3	0.40	0.3	1.3	04	03
Amount of subsidy per year		**246.42**	**77.32**	**57.15**	**2.04**	**063**	**047**

Loan 6	2015	2016	2017
Interest rate	1.00	1.00	1.00
Euribor*	0.17	-0.04	-0.15
Interest rate on government guaranteed loans	1.17	0.97	0.86
Interest rate on comparable commercial loans**	4.3	3.40	3.3
Interest rate differential	3.132	2.44	2.445
* Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		
** Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 6	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		9658.41	8690.68	7422.95	80.00	70.59	61.18
Interest rate differential (%)		3.132	2.44	2.445	3.132	2.435	2.445
Amount of subsidy per year		**302.50**	**211.62**	**181.49**	**2.51**	**1.72**	**1.50**

Loan 7	2015	2016	2017
Interest rate	1.00	1.00	1.00
Euribor*	0.17	-0.04	-0.15
Interest rate on government guaranteed loans	1.17	0.97	0.86
Interest rate on comparable commercial loans**	4.3	3.40	3.3
Interest rate differential	3.132	2.44	2.445
* Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		
** Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 7	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		24146.56	24623.58	24267.34	200.00	200.00	200.00
Interest rate differential (%)		3.132	2.44	2.445	3.132	2.435	2.445
Amount of subsidy per year		**756.27**	**599.58**	**593.34**	**6.26**	**4.87**	**4.89**

Loan 8	2015	2016	2017
Interest rate	1.75	1.75	1.75
Euribor*	0.00	0.00	0.00
Interest rate on government guaranteed loans	1.75	1.75	1.75
Interest rate on comparable commercial loans**	4.3	3.40	3.3
Interest rate differential	2.55	1.65	1.55
* Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		
** Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)							
Loan 8	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		7847.63	8002.66	7886.89	65.00	65.00	65.00
Interest rate differential (%)		2.55	1.65	1.55	2.55	1.65	1.55
Amount of subsidy per year		**200.11**	**132.04**	**122.25**	**1.66**	**1.07**	**1.01**

Loan 9	2015	2016	2017
Interest rate	0.80	0.80	0.80
Euribor*	0.17	-0.04	-0.15
Interest rate on government guaranteed loans	0.97	0.77	0.66
Interest rate on comparable commercial loans**	4.3	3.40	3.3
Interest rate differential	3.332	2.64	2.645
* Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		
** Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)							
Loan 9	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		18968.33	19343.05	19063.21	157.11	157.11	157.11
Interest rate differential (%)		3.332	2.64	2.645	3.332	2.635	2.645
Amount of subsidy per year		**632.02**	**509.69**	**504.22**	**5.23**	**4.14**	**4.16**

Loan 10	2015	2016	2017
Interest rate	1.00	1.00	1.00
Euribor*			
Interest rate on government guaranteed loans	1.00	1.00	1.00

Interest rate on comparable commercial loans**		4.3	3.40	3.3			
Interest rate differential		3.3	2.40	2.3			
* Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx						
** Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html						

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 10	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		0.00	0.00	5460.15	0.00	0.00	45.00
Interest rate differential (%)		3.3	2.40	2.3	3.3	2.4	2.3
Amount of subsidy per year		**0.00**	**0.00**	**125.58**	**0.00**	**0.00**	**1.04**

Loan 11	2015	2016	2017
Interest rate	2.50	2.50	2.50
USD Libor*	0.00	0.00	0.00
Interest rate on government guaranteed loans	2.50	2.50	2.50
Interest rate on comparable commercial loans**	4.3	3.40	3.3
Interest rate differential	1.8	0.90	0.8
* Source:	https://www.global-rates.com/interest-rates/euribor/2017.aspx		
** Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding loan balance in the previous year x interest rate differential)

Loan 11	Year	2015	2016	2017	2015	2016	2017
	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding loan balance in the previous year		63867.65	65129.37	64187.11	529.00	529.00	529.00
Interest rate differential (%)		1.8	0.90	0.8	1.8	0.9	0.8
Amount of subsidy per year		**1149.62**	**586.16**	**513.50**	**9.52**	**4.76**	**4.23**

Public finance support	Year	2015	2016	2017	2015	2016	2017
Summary of calculated subsidies	Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Loan 1		8.05	6.84	6.18	0.07	0.06	005
Loan 2		2.09	1.77	1.60	0.02	0.01	001
Loan 3		71.57	59.64	53.88	0.59	0.48	044
Loan 4		951.50	734.28	697.81	7.88	5.96	575
Loan 5		246.42	77.32	57.15	2.04	0.63	047
Loan 6		302.50	211.62	181.49	2.51	1.72	150
Loan 7		756.27	599.58	593.34	6.26	4.87	489
Loan 8		200.11	132.04	122.25	1.66	1.07	101
Loan 9		632.02	509.69	504.22	5.23	4.14	416
Loan 10		0.00	0.00	125.58	0.00	0.00	104
Loan 11		1149.62	586.16	513.50	9.52	4.76	423
Grants		1810.99	441.99	1848.50	15.00	3.59	1523
Amount of subsidies per year		6131.13	3360.94	4705.49	50.78	27.30	38.78

Measure or project (written description)	Source of subsidy	Subsidy type	Beneficiary	2015 (RSD million)	2016 (RSD million)	2017 (RSD million)	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (RSD million)	Average annual amount	Source
Loan to underground coal mines[72]	JP EPS Belgrade	Loan provided by SOE	JP PEU Resavica	1166.91	1166.91	1166.91	9.67	9.48	9.62	1166.91	9.59	Audit and Company Reports. http://www.jppeu.rs/informator.html Downloaded on 07.09.2018
Debt for electricity	JP EPS Belgrade	Right not to pay	JP PEU Resavica	788.23	800.49	1161.06	6.53	6.50	9.57	916.59	7.53	http://www.jppeu.rs/dokumenti/Izvestaj%20revizora%20i%20set%20redovnih%20finansijskih%20izvestaja%20za%202017.%20godinu.pdf Downloaded on 07.09.2018
TOTAL				**1955.14**	**1967.40**	**2327.97**	**16.19**	**15.98**	**19.19**	**2083.50**	**17.12**	

	2015	2016	2017
Interest rate on comparable commercial loans*	7.2	6.00	5.5
* Source: National Bank of Serbia	https://www.nbs.rs/internet/cirilica/90/mp.html		

Subsidy calculation (outstanding balance of the loan and debt for electricity X interest rate on comparable commercial loans)

Year	2015	2016	2017	2015	2016	2017
Currency	RSD million	RSD million	RSD million	EUR million	EUR million	EUR million
Outstanding balance	1955.14	1967.40	2327.97	16.19	15.98	19.19
Interest rate on comparable loans	72	6	5.5	7.2	6	5.5
Amount of subsidy per year	**140.77**	**118.04**	**128.04**	**1.17**	**0.96**	**1.06**

[72] Loan could be converted in capital no interest payment no repayment up to privatization

Annex 1.6 - Ukraine – Detailed list of subsidy measures

Ukraine – Fiscal support

Measure or project (written description)	Source of subsidy	Subsidy type	Beneficiary	2015 (in UAH million)	2016 (in UAH million)	2017 (in UAH million)	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (in UAH million)	Average annual amount (EUR million)	
UAH/EUR exchange rate				24.23	28.29	30.00	24.23	28.29	30.00			www.bank.gov.ua/files/Exchange_r.xls Accessed on 01.09.2018.
Restructuring of coal and peat industry[73]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	State coal mines	205.71	106.70	244.12	8.49	3.77	8.14	185.51	6.80	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146477 Downloaded on 12.10.2018
Rescue measures at coal mining enterprises[74]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	State coal mines	234.41	263.21	287.65	9.67	9.30	9.59	261.76	9.52	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146478 Downloaded on 12.10.2018

[73] State Treasury Service of Ukraine Reports on the Execution of State Budget

[74] State Treasury Service of Ukraine Reports on the Execution of State Budget

State support for coal mining enterprises on partial compensation of production costs of finished marketable coal[75]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	State coal mines	1212.00	1372.76	2121.77	50.02	48.52	70.72	1568.84	56.42	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146479 Downloaded on 12.10.2018
Measures to improve safety measures at mining enterprises such as installation of modern equipment to control air parameters at mines and devices to control degassing parameters[76]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	State coal mines	0.00	0.00	99.40	0.00	0.00	3.31	33.13	1.10	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146480 Downloaded on 12.10.2018
Replenishment of current capital or increase the statutory funds of coal mines to settle the arrears of wages to employees as of 1 January 2015[77]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	State coal mines	200.00	500.00	0.00	8.25	17.67	0.00	233.33	8.64	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146482 Downloaded on 13.10.2018
State support for construction of mine №10 "Novovolynska"[78]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	State coal mines	145.83	50.00	70.25	6.02	1.77	2.34	88.69	3.38	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146483 Downloaded on 13.10.2018
Prevention of the emergency situation due to flooding of the mines of Pervomaysko-Stakhaniv coal mining region[79]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	State coal mines	0.00	0.00	9.83	0.00	0.00	0.33	3.28	0.11	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146484 Downloaded on 13.10.2018

[75] State Treasury Service of Ukraine Reports on the Execution of State Budget
[76] State Treasury Service of Ukraine Reports on the Execution of State Budget
[77] State Treasury Service of Ukraine Reports on the Execution of State Budget
[78] State Treasury Service of Ukraine Reports on the Execution of State Budget
[79] State Treasury Service of Ukraine Reports on the Execution of State Budget

Loan guarantee payment from budget for Loan Lisichanskvugillya PJSC and the State Development Bank of the PRC	Ministry of Finance	Direct budget transfer	State coal mine	419.50	461.69	455.60	17.31	16.32	15.18	447.62	16.27	http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146486 Downloaded on 13.10.2018
Taxes and contributions in arrears - state coal mines[80]	Government/Tax administration	Taxes and contributions	State coal mine	3342.20	4213.97	5293.10	137.94	148.95	176.41	4283.09	154.43	http://sfs.gov.ua/dovidniki--reestri--perelik/pereliki-/296361.html Accessed on 28.10.2018
Taxes and contributions in arrears - Centrenergo[81]	Government/Tax administration	Taxes and contributions	Centrenergo	98.20	120.19	475.08	4.05	4.25	15.83	231.16	8.05	http://sfs.gov.ua/dovidniki--reestri--perelik/pereliki-/296361.html Accessed on 28.10.2018
State support for repairs of TPP[82]	Ministry of Energy and Coal Industry of Ukraine	Direct budget transfer	Centrenergo	59.31	56.26	52.66	2.45	1.99	1.75	56.08	2.10	http://www.centrenergo.com/ru/shareholders/reports/ Accessed on 20.10.2018
VAT exemption for coal supply[83]	Ministry of Finance	Revenue forgone	TPPs	0.00	2116.20	2608.85	000	74.80	86.95	157502	5392	http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=64598 Accessed on 05.12.2108
Total support				**5917.17**	**9260.97**	**11718.31**	**244.22**	**327.34**	**390.56**	**8965.48**	**266.89**	

[80] The State Fiscal Service of Ukraine

[81] The State Fiscal Service of Ukraine

[82] Centrenergo Audit Reports

[83] Ministry of Finance support documents

	2015	2016	2017
Interest rate on short-term commercial loans*	18.20%	16.40%	13.50%
*Source: National Bank of Ukraine	https://bank.gov.ua/control/en/publish/category?cat_id=82116		

Subsidy calculation for taxes and contributions in arrears (amount of debt x interest rate on comparable commercial loans*)

	Year	2015	2016	2017	2015	2016	2017
	Currency	UAH million	UAH million	UAH million	EUR million	EUR million	EUR million
Outstanding balance of tax and con. in arrears		3440.40	4334.16	5768.18	142.00	153.19	192.25
Interest rate on comparable commercial loans* (%)		18.20%	16.40%	13.50%	18.20%	16.40%	13.50%
Amount of subsidy per year		**626.15**	**710.80**	**778.70**	**25.84**	**25.12**	**25.95**

Fiscal support	**Year**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
summary of calculated subsidies	**Currency**	**UAH million**	**UAH million**	**UAH million**	**EUR million**	**EUR million**	**EUR million**
Taxes and contrib. in arrears		626.15	710.80	778.70	25.84	25.12	25.95
Direct budget transfers		2476.77	4926.81	5950.13	102.22	174.14	198.31
Total:		**3102.92**	**5637.61**	**6.728.84**	**128.07**	**199.27**	**224.26**

Measure or project (written description)	Source of subsidy	Subsidy type	Beneficiary	2015 (in UAH million)	2016 (in UAH million)	2017 (in UAH million)	2015 (EUR million)	2016 (EUR million)	2017 (EUR million)	Average annual amount (in UAH million)	Average annual amount (EUR million)	Source (with hyperlink)
Electricity arrears of state owned mines to SOE "Regional Electricity Networks"	SOE "Regional Electricity Network"	SOE investment	State-owned coal mines	8874.70	1106380	12501.40	366.29	391.06	416.14	10813.30	391.16	http://search.ligazakon.ua/l_doc2.nsf/link1/GH6D900A.html Accessed on 28.11.218
TOTAL				8874.70	1106380	12501.40	366.29	391.06	416.14	10813.30	391.16	

	2015	2016	2017
Interest rate on short-term commercial loans*	18.20%	16.40%	13.50%

*Source: National Bank of Ukraine https://bank.gov.ua/control/en/publish/category?cat_id=82116

Subsidy calculation for electricity arrears (amount of debt x interest rate on comparable commercial loans*)

Year	2015	2016	2017	2015	2016	2017
Currency	UAH million	UAH million	UAH million	EUR million	EUR million	EUR million
Electricity arrears	8874.70	11063.80	12501.40	366.29	391.06	416.14
Interest rate on comparable commercial loans* (%)	18.20%	16.40%	13.50%	18.20%	16.40%	13.50%
Amount of subsidy per year	**1615.20**	**1814.46**	**1687.69**	**66.66**	**64.13**	**56.18**

Annex 2 Accounting data: Costs of production of electricity in 2017

Power producers	fuel	Produced electricity	Produced electricity total	Operating expenses (audited reports)	Unit costs of production in 2017	Operating expenses coal /hydro	Unit operating expenses coal /hydro
		MWh	MWh	EUR	EUR/MWh	EUR	EUR/MWh
[1]	[2]	[3]	[4]	[5]	[6]=[5]/[4]	[7]	[8]=[7]/[3]
EPBIH	coal	6.007.230	6.948.640	330.953.610	48	302.711.310	50
	hydro	941.410				28.242.300	30
ERS - RiTE	coal	2.870.620	4.445.920	128.463.596	45	128.463.596	45
ERS-HE	hydro	1.575.300		45.375.947	29	45.375.947	29
EPHZHB	coal	0	2.055.000				
	hydro	2.055.000		59.835.461	29	59.835.461	29
Total BIH	coal	8.877.850	13.449.560	564.628.614	42	431.174.906	49
	hydro	4.571.710				133.453.708	29
EPCG	coal	1.265.000	2.241.200	108.416.208	48	79.130.208	63
	hydro	976.200				29.286.000	30
EPS	coal	24.240.000	34.004.000	1.235.229.017	36	942.309.017	39
	hydro	9.764.000				292.920.000	30
KEK	coal	5.725.962	5.725.962	145.509.000	25	145.509.000	25
	hydro	0				0	
ELEM	coal	3.145.100	4.080.000	157.730.020	50	157.730.020	50
	hydro	934.900		31.829.138	34	31.829.138	34
Ukraine	coal	44.457.000	142.225.000				
	hydro&other	97.768.000					

Note: Operating expenses for ERS and EPHHZHB (Bosnia and Herzegovina) and ELEM (North Macedonia) are taken from their respective financial reports for 2017. For other producers, the costs of production from hydro power plants are estimated at 30 EUR/MWh and deducted from total operating expenses disclosed in the financial reports 2017. The difference is attributed to coal-fired production from thermal power plants.

Annex 2.1 Costs of generation in coal fired thermal power plants adjusted for direct coal subsidies (data 2017)

Power producer	Produced electricity from coal 2017	**Operating and financial expenses 2017**	**Unit costs of electricity from coal**	Subsidies to 2017 power production	Expenses adjusted for subsidies	**Adjusted unit costs of electricity from coal**	Impact of subsidies on TPP' cost
	MWh	**000 EUR**	**EUR/MWh**	000 EUR	000 EUR	**EUR/MWh**	%
[1]	[2]	[3]	[4]=[3]/[2]	[5]	[6]=[3]+[5]	[7]=[6]/[2]	[8]=[7]/[4]-1
EPBIH	6.007.230	304.828	**51**	13.012	317.840	**53**	4%
EPCG	1.265.000	80.989	**64**	850	81.839	**65**	1%
EPS	24.240.000	958.501	**40**	49.942	1.008.443	**42**	5%
KEK[84]	5.725.962	148.391	**26**	14.370	162.761	**28**	10%
ERS	2.870.620	130.194	**45**	10.310	140.504	**49**	8%
ELEM	3.145.100	164.787	**52**	2.930	167.717	**53**	2%
Ukraine	44.457.000	n/a	n/a	193.490			

[84] The cost calculation for KEK cannot be taken for benchmarking due to abnormally low costs associated with valuation of assets in use.

Annex 2.2 Assessed costs of electricity produced in the incumbent utilities operating coal fired plants including all analysed subsidies

Power producers	fuel	capacity	produced electricity per source	operating expenses 2017 (audited reports)	Operating expenses per plant	Financial expenses per plant	Coal subsidies	Carbon costs	Return on equity	Return on equity per plant type	Full costs per plant type	Full costs of utility	Unit costs of utility
		MW	MWh	EUR	EUR	EUR	EUR	EUR	EUR	EUR	EUR	EUR	EUR/MWh
[1]	[2]		[3]	[5]	[7]	[6]	[7]	[8]			[9]	[10]	[11]
EPBIH	coal	1165	6.007.230	330.953.610	302.711.310	2.116.416	13.012.000	120.144.600	45.855.090	31.893.241	469.877.568		
	hydro&	510	941.410		28.242.300	197.457	0	0	0	13.961.848	42.401.605	512.279.173	74
ERS - RiTE	coal	600	2.870.620	128.463.596	128.463.596	1.730.221	10.310.000	57.412.400	13.200.258	5.866.781	203.782.998		
ERS-HE	hydro	750	1.575.300	45.375.947	45.375.947	1.313.559	0	0	0	7.333.476	54.022.983	257.805.981	58
EPHZHB	coal		0	0	0		0	0	0	0	0		
	hydro	860	2.055.000	59.835.461	59.835.461	449.393	0	0	13.104.360	13.104.360	73.389.214	73.389.214	36
Total BIH	coal	1765	8.877.850	564.628.614	431.174.906	3.846.637	23.322.000	177.557.000	59.055.347	26.829.521	662.730.064		
	hydro&	2120	4.571.710	0	133.453.708	1.960.409	0	0	0	32.225.827	167.639.944	830.370.008	62
EPCG	coal	225	1.265.000	108.416.208	79.130.208	1.859.060	850.000	25.300.000	29.700.060	7.637.158	112.917.366		
	hydro&	650	976.200	0	29.286.000	688.036	0	0	0	22.062.902	51.348.902	164.266.268	73
EPS	coal	4054	24.240.000	1.235.229.017	942.309.017	16.192.352	49.941.873	484.800.000	171.129.693	94.324.918	1.587.568.160		
	hydro&	3301	9.764.000	0	292.920.000	5.033.448	0	0	0	76.804.774	374.758.223	1.962.326.382	58
KEK	coal	960	5.725.962	145.509.000	145.509.000	2.882.000	14.370.000	114.519.240	3.686.040	3.686.040	280.966.280		
	hydro		0	0	0	0	0	0	0	0	0	280.966.280	49
ELEM	coal	824	3.145.100	157.730.020	157.730.020	7.056.734	2.930.000	62.902.000	17.253.387	10.302.022	240.920.776		
	hydro&	556	934.900	31.829.138	31.829.138	1.424.014	0	0	0	6.951.365	40.204.517	281.125.293	69
Ukraine - all	coal		44.457.000	0	0	0	193.490.000	889.140.000					
	hydro&		97.768.000	0	0	0	0	0					

Annex 2.3 Component of electricity prices charged to end-customers

ELECTRICITY PRICE COMPONENTS FOR HOUSEHOLD CONSUMERS - ANNUAL DATA 2017

EUR/kWh - Households	Energy and supply	Network costs	Taxes fees levies
Montenegro	00378	00427	00189
North Macedonia*[85]	00516	00175	00124
Serbia	00240	00289	00162
Bosnia and Herzegovina	00342	00381	00140
Kosovo*	00334	00254	00098

Source: EUROSTAT

Electricity price components for non-household consumers - annual data 2017

EUR/kWh - Industry	Energy and supply	Network costs	Taxes fees levies
Montenegro	00413	00308	00193
North Macedonia	00471	00072	00098
Serbia	00424	00215	00195
Bosnia and Herzegovina	00398	00193	00117
Kosovo*	00565	00181	00079
Ukraine			

Source: EUROSTAT

* For North Macedonia, the price of the energy component charged to households included network costs for customers supplied under universal service. In the analysis, the breakdown of the price provided by the regulatory authority was used with the energy component in the amount of 45,17 EUR/MWh.

[85] The reported price for households includes network charges for regulated supply. The net energy and supply component, as reported to ACER, is 45,17 EUR/MWh. The regulator set the price of regulated generation at 38,54 EUR/MWh.

Annex 3. **Contracting Party – General Data**

Bosnia and Herzegovina - Key electricity facts and figures

Electricity Facts and Figures	2015	2016	2017	Index
Description of data (unit)				*(2017/2015)*
Electricity production [GWh]	*14408*	*16509*	*15151*	*105.2*
Gross electricity consumption [GWh]	*12606*	*12865*	*13366*	*106.0*
Final consumption of electricity [GWh]	*11183*	*11432*	*11735*	*104.9*
Consumption structure [GWh]				
Industrial transport services and other non-residential sectors	*6457*	*6699*	*6979*	*108.1*
Households (residential customers)	*4726*	*4733*	*4756*	*100.6*
Capacity of power plants [MW]	*4009*	*4352*	*4385*	*109.4*
by source: Coal-fired	*1856*	*2156*	*2156*	*116.2*
Hydro	*2150*	*2180*	*2207*	*102.6*
Other renewable	*9*	*15*	*22*	*244.4*
Electricity generation in coal-fired TPP [GWh]	*8712*	*10608*	*10918*	*125.3*
Share of coal-fired electricity generation in total electricity production [%]	*60.47*	*64.26*	*72.06*	
Share of coal-fired electricity generation in final electricity consumption [%]	*77.90*	*92.79*	*93.04*	

Source: SERC Annual Reports 2015-2017

Kosovo* - Key electricity facts and figures

Electricity Facts and Figures	2015	2016	2017	Index
Description of data (unit)				*(2017/2015)*
Electricity production [GWh]	*5503*	*5835*	*5300*	*96.3*
Gross electricity consumption [GWh]	*5590*	*5346*	*5463*	*97.7*
Final consumption of electricity [GWh]	*3860*	*3686*	*4008*	*103.8*
Consumption structure [GWh]				
Industrial transport services and other	*1746*	*1472*	*1717*	*98.3*
Households (residential customers)	*2114*	*2214*	*2291*	*108.4*
Capacity of power plants [MW]	*1222*	*1033*	*1038*	*84.9*
by source: Coal-fired	*1171*	*960*	*960*	*82.0*
Hydro	*49*	*71*	*75*	*153.1*
Other renewable	*1*	*2*	*3*	*300.0*
Electricity generation in coal-fired TPPs [GWh]	*5361*	*5601*	*5121*	
Share of coal-fired electricity generation in total electricity production [%]	*97.42*	*95.99*	*96.62*	
Share of coal-fired electricity generation in final electricity consumption [%]	*138.89*	*151.95*	*127.77*	

Source: ERO Annual Reports 2015-2017

North Macedonia - Key electricity facts and figures

Electricity Facts and Figures	*2015*	*2016*	*2017*	Index
Description of data (unit)				(2017/2015)
Electricity production [GWh]	*5.261*	*5.302*	*5.229*	*99.4*
Gross electricity consumption [GWh]	*7.764*	*7.435*	*7.271*	*93.7*
Final consumption of electricity [GWh]	*6.645*	*6.455*	*6.377*	*96.0*
Consumption structure [GWh]				
Industrial transport services and other non-residential sectors	*3503*	*3398*	*3280*	*93.6*
Households (residential customers)	*3142*	*3057*	*3097*	*98.6*
Capacity of power plants [MW]	*2054*	*2057*	*2062*	*100.4*
by source: Coal-fired	*800*	*825*	*825*	*103.1*
Gas-fired	*287*	*287*	*287*	*100.0*
Oil-fired	*200*	*200*	*200*	*100.0*
Hydro	*671*	*685*	*689*	*102.7*
Other renewable	*58*	*60*	*61*	*105.2*
Electricity generation in coal-fired TPP [GWh]	*3093*	*2699*	*3145*	*101.7*
Share of coal-fired electricity generation in total electricity production [%]	*58.79*	*50.91*	*60.15*	
Share of coal-fired electricity generation in final electricity consumption [%]	*46.55*	*41.81*	*49.32*	

Source: ERC Annual Reports 2015-2017

Montenegro - Key electricity facts and figures

Electricity Facts and Figures	*2015*	*2016*	*2017*	Index
Description of data (unit)				(2017/2015)
Electricity production [GWh]	*2872*	*3023*	*2347*	*81.7*
Gross electricity consumption [GWh]	*3464*	*3338*	*3472*	*100.2*
Final consumption of electricity [GWh]	*2876*	*2787*	*2945*	*102.4*
Consumption structure [GWh]				
Industrial transport services and other	*1625*	*1536*	*1659*	*102.1*
Households (residential customers)	*1251*	*1251*	*1286*	*102.8*
Capacity of power plants [MW]	*886*	*892*	*972*	*109.7*
by source: Coal-fired	*219*	*219*	*219*	*100.0*
Hydro	*668*	*674*	*681*	*101.9*
Other renewable	*0*	*0*	*72*	
Electricity generation in coal-fired TPP [GWh]	*1412*	*1216*	*1265*	*89.6*
Share of coal-fired electricity generation in total electricity production [%]	*49.16*	*40.22*	*53.90*	
Share of coal-fired electricity generation in final electricity consumption [%]	*49.10*	*43.63*	*42.95*	

Source: RAE Annual Reports 2015-2017

Serbia - Key electricity facts and figures

Electricity Facts and Figures		*2015*	*2016*	*2017*	Index
Description of data (unit)					2017/2015
Electricity production [GWh]		*35912*	*36781*	*34441*	*95.9*
Gross electricity consumption [GWh]		*34115*	*34018*	*34518*	*101.2*
Final consumption of electricity [GWh]		*28947*	*29210*	*29713*	*102.6*
Consumption structure [GWh]					
Industrial transport services and other		*14469*	*14888*	*15504*	*107.2*
Households (residential customers)		*14062*	*13931*	*13815*	*98.2*
Capacity of power plants [MW]		*7192*	*7450*	*7838*	*109.0*
by source:	Coal-fired	*3905*	*4032*	*4386*	*112.3*
	Gas-fired	*353*	*357*	*357*	*101.1*
	Hydro	*2898*	*3024*	*3054*	*105.4*
	Other renewable	*36*	*37*	*41*	*113.9*
Electricity generation in coal-fired TPPs [GWh]		*25017*	*25016*	*24240*	*96.9*
Share of coal-fired electricity generation in total electricity production [%]		*69.66*	*68.01*	*70.38*	
Share of coal-fired electricity generation in final electricity consumption [%]		*86.42*	*85.64*	*81.58*	

Source: AERS Annual Reports 2015-2017

Ukraine - Key electricity facts and figures

Electricity Facts and Figures		*2015*	*2016*	*2017*	Index
Description of data (unit)					(2017/2015)
Electricity production [GWh]		*144063*	*141301*	*142225*	*98.7*
Gross electricity consumption [GWh]		*142717*	*130095*	*130780*	*91.6*
Final consumption of electricity [GWh]		*117140*	*116864*	*104917*	*89.6*
Consumption structure [GWh]					
Industrial transport services and other		*80122*	*80413*	*69367*	*86.6*
Households (residential customers)		*37018*	*36451*	*35550*	*96.0*
Capacity of power plants [MW]		*49319*	*51595*	*51785*	*105.0*
by source:	Coal-fired	*24523*	*24565*	*24565*	*100.2*
	Gas-fired	*4376*	*5947*	*5972*	*136.5*
	Nuclear	*13835*	*13835*	*13835*	*100.0*
	Hydro	*5884*	*6220*	*6229*	*105.9*
	Other renewable	*701*	*1028*	*1184*	*168.9*
Electricity generation in coal-fired TPP [GWh]		*44457*	*44904*	*41769*	
Share of coal-fired electricity generation in total electricity production [%]		*30.86*	*31.78*	*29.37*	
Share of coal-fired electricity generation in final electricity consumption [%]		*37.95*	*38.42*	*39.81*	

Source: NEURC Annual Reports 2015-2017

Audited financial reports of incumbent operators:

EPBIH	http://www.sase.ba/v1/Tr%C5%BEi%C5%A1te/Emitenti/Profil-emitenta/symbol/JPESR#tab_FinancialReportsTab
	ERS
RITE Gacko	https://www.blberza.com/Pages/FinRepCompany.aspx?code=rite
RITE Ugljevik	https://www.blberza.com/Pages/FinRepCompany.aspx?code=rteu
HE Drina	https://www.blberza.com/Pages/FinRepCompany.aspx?code=hedr
HE Vrbas	https://www.blberza.com/Pages/FinRepCompany.aspx?code=helv
HE Trebisnjica	https://www.blberza.com/Pages/FinRepCompany.aspx?code=hetr
EPHZHB	http://www.sase.ba/v1/Tr%C5%BEi%C5%A1te/Emitenti/Profil-emitenta/symbol/JPEMR#tab_FinancialReportsTab
EPCG	
EPS	http://eps.rs/Documents/JP%20EPS%20izvestaj%202017.pdf
KEK	http://kek-energy.com/kek/en/financial-audit-reports/
ELEM	https://www.mse.mk/Objavi/Repository/Announcement166/%D0%95%D0%9B%D0%95%D0%9C%20%D0%90%D0%94%20%D0%A1%D0%BA%D0%BE%D0%BF%D1%98%D0%B5%20-%20RI%20ELEM%202017%20za%20CRM20190129102913.PDF

6.1 References

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