



THE GREAT COAL JOBS FRAUD

How unrealistic employment claims are deceiving coal mining communities in southeast Europe and delaying a just transition to sustainable energy

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EXECUTIVE SUMMARY

In several southeast European countries¹, new coal-fired power plants are planned. This is in contrast to most of the EU, where no new coal plants are planned, due to their climate and health impacts, and their poor economics. These plans for southeast Europe are accompanied by promises of creating new workplaces or saving current ones. This study examines these claims and finds that in almost all cases, they are exaggerated. In fact, even the current levels of employment cannot be maintained in most cases, so a fair and inclusive plan is needed to transform coal-dependent communities.

The planned 500 MW Kosovo e Re power plant is perhaps the regional prize winner in terms of exaggerated employment claims, with media statements by the preferred bidder suggesting that 10 000 jobs would be created during the construction phase and 500 during operation. Our analysis shows that no more than about 1600 workers should be required during the construction stage – and many of them are likely to be imported specialists – while no more than 200 should be required during operation.

In other cases such as Tuzla 7 and Banovići in Bosnia-Herzegovina or Pljevlja II in Montenegro, no exact numbers of workplaces are mentioned, but claims are frequently made about preserving the workplaces in the mines.

However, most of the plants and mines are already uneconomic and even if no new plants are built, the number of workers, particularly in the mines, will have to be reduced. In fact, all the countries have committed to participate in a regional electricity market either as part of EU membership or through the Energy Community Treaty, which means that subsidies can no longer be handed out to the energy sector at will, but must follow strict rules aimed at ensuring a level playing field.

At the same time, climate change is gathering pace. Calculations suggest that at least 80 per cent of coal reserves need to stay in the ground if we are to avoid catastrophic climate change of more than 2 degrees celsius. Even this is considered too large a change to ensure the safety of climate-vulnerable countries, and in the 2015 Paris Agreement, parties agreed to try to limit climate change to 1.5 degrees. According to new research by Oil Change International, this means that no new fossil fuel extraction or transportation infrastructure should be built, and governments should grant no new permits for such activities².

With the Paris Agreement coming into force, the broader policy framework for clean energy investments is also expected to move to the forefront. Meanwhile, worldwide employment in the renewable energy sector continues to grow significantly, reaching 7.7 million in 2014³, up 18 per cent from the previous year. The EU alone hosts almost 1.2 million of these jobs, and figures on job creation in the energy efficiency sector are also projected to rise.

All this means that a well-planned and just transition for the workers and communities that depend on coal is needed. Countries which have already restructured and in some cases closed their coal mining industries, such as the UK and the Romanian hard coal sector, have shown what can happen if coal mine closure is carried out without good planning and adequate inclusion of those affected.

So far, not one southeast European country has an adequate plan for a just transformation of their mining areas. This represents both a threat of future social unrest and an opportunity to let the people of these regions imagine the future they want and plan for life beyond coal.

1 For the purposes of this paper, southeast Europe includes Albania, Bulgaria, Bosnia and Herzegovina,

Croatia, Greece, Kosovo, Macedonia, Montenegro, Romania and Serbia. According to the UN, Kosovo is “under the United Nations Interim Administrative Mission in Kosovo (UNMIK) established pursuant to Security Council Resolution 1244”; in this paper it is referred to as “Kosovo”. According to the UN, the official name of Macedonia is “the former Yugoslav Republic of Macedonia”; in this paper it is referred to as “Macedonia”.

2 Oil Change International: The Sky’s Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production, 22 September 2016, <http://priceofoil.org/2016/09/22/the-skys-limit-report/>

3 http://www.irena.org/DocumentDownloads/Publications/IRENA_RE_Jobs_Annual_Review_2015.pdf, page 12

INTRODUCTION – PLANS FOR NEW LIGNITE MINES AND PLANTS

In 2004, the World Bank warned that the current levels of employment in the coal industry in southeast Europe were unsustainable. It estimated that the workforce needed to be reduced between 68 and 83 per cent in order for the industry to become viable. Such a political hot potato was never going to be easy to deal with, and successive governments have failed to either plan or implement coherent strategies for a well-organised and just re-organisation of the industry.

In the meantime, climate change has gathered pace. It has been calculated that at least 80 per cent of coal reserves need to stay in the ground if we are to avoid catastrophic climate change of more than 2 degrees celsius⁴. Even this is considered too large a change to ensure the safety of climate-vulnerable countries, and in the 2015 Paris Agreement, parties agreed to try to limit change to 1.5 degrees. A recent report by Oil Change International⁵ found that the potential carbon emissions from the oil, gas, and coal in the world's currently-operating fields and mines would take us beyond 2°C of warming and that the reserves in currently operating oil and gas fields alone, even with no coal, would take the world beyond 1.5°C. The study concludes:

- No new fossil fuel extraction or transportation infrastructure should be built, and governments should grant no new permits for them.

- Some fields and mines – primarily in rich countries – should be closed before fully exploiting their resources, and financial support should be provided for non-carbon development in poorer countries.
- This does not mean stopping the use of all fossil fuels overnight. Governments and companies should conduct a managed decline of the fossil fuel industry and ensure a just transition for the workers and communities that depend on it.

The last point is of crucial importance for southeast Europe. Countries which have already restructured and in some cases closed their coal mining industries, such as the UK⁶ and the Romanian hard coal industry - whose demise is outlined in this report - have shown what can happen if coal mine closure is carried out without good planning and adequate inclusion of those most affected.

However it is questionable how much has been learnt from such experiences. Today, a transition to cleaner energy systems is well under way in most of the EU and in the US, while even China's coal use appears to have peaked⁷. The coal industry is recognised in many parts of the world as an economic liability.

	Current employment (2004)	Labor force in viable industry	Required labor force reduction %
Bosnia & Herzegovina	15 000	3 000	80
Bulgaria	40 000	5 000	80 [sic]
Romania	40 000	7 000	83
Serbia	25 000	8 000	68

<https://www.energy-community.org/pls/portal/docs/11803.PDF>

⁴ <http://www.nature.com/nature/journal/v517/n7533/full/nature14016.html>

⁵ <http://priceofoil.org/2016/09/22/the-skys-limit-report/>

⁶ http://news.bbc.co.uk/onthisday/hi/dates/stories/march/12/newsid_3503000/3503346.stm

⁷ <https://www.theguardian.com/environment/2016/jul/25/china-coal-peak-hailed-turning-point-climate-change-battle>

Tougher pollution legislation and the development of various forms of carbon pricing, together with the rapidly falling costs of solar and wind generation, mean that coal is no longer an economic option in many places. A stark example of this is Vattenfall's sale of its lignite power plants and mines in Germany - a deal in which it expected to clock up a loss of EUR 2.4-2.9 billion. The company still considered this deal better than holding on to them.⁸

Another example, closer to the region in question, is the disastrous Šoštanj 6 lignite plant in Slovenia, whose costs more than doubled from around EUR 600 million to EUR 1.4 billion and which is expected to lose around EUR 70-80 million per year.⁹

Many of the changes in the electricity market have happened extremely fast, and have often not been predictable.

This situation has led some trade unions¹⁰ and other civil society organisations to recognise that a transition to a cleaner energy system is necessary, while emphasising that the transition must be a just one, with adequate planning, financing and inclusion of workers in decision-making. In 2015 the International Labour Organization adopted principles for such a just transition.¹¹

This increasing global recognition of the need for change is only just starting to reach southeast Europe. The region's coal industry is largely based on lignite/brown coal rather than hard coal, so the mines need to be near to the power plants because of the low calorific value, high moisture content, resulting in higher costs of transportation. This short supply chain has given rise to all sorts of measures aimed at keeping lignite costs low for the power plants while enabling uneconomic mines to continue working, such as the state covering mines' social welfare contributions in the Federation of Bosnia and Herzegovina from 2009-2015.¹²

Such measures, however, cannot continue. It is hardly fair to subsidise one highly polluting industry from the public purse while others have to fend for themselves. Moreover, all the states covered in this report are either EU Member States or Contracting Parties of the Energy Community Treaty. In both cases, state aid to the energy sector is strictly controlled and is not allowed if it distorts competition. Operating aid for the mining sector is not allowed at all, only assistance with the closure of mines¹³. While there is little or no

competition between lignite mines, there is competition between different types of energy generation and different energy generation companies that could easily be distorted by subsidies.

At the same time as the non-EU southeast European countries are opening up their energy markets and subsidies are becoming more and more tightly regulated, a second challenge looms. Of the 37 coal units currently in operation in Bosnia and Herzegovina, Kosovo, Macedonia, Montenegro and Serbia, with an installed capacity of 8658 MW, no fewer than 34 of them - 7662 MW installed capacity - still need to either implement investments to bring them into line with the EU Large Combustion Plants Directive or be closed during the next few years. Plans exist to improve pollution control measures on many of these plants, but they face increasing problems due to their old age and will gradually need to be phased out.

Numerous plans exist for new lignite plants in the region - some to replace existing ones, and some completely new ones. Governments and electricity companies often promote these projects as creating new jobs and saving existing jobs in lignite mines, but this report shows that these claims are almost always exaggerated and in some cases downright fraudulent.

The greatest need for workers comes in the coal mines and during the construction stage of the plants. However, while construction does temporarily require some local labour, the numbers cited by decision-makers often overlook the fact that many of the workers will need to be imported from China or elsewhere due to the need for specialist knowledge. Mines in the region tend to be overstaffed compared to their counterparts in nearby countries, putting the associated power plants at a disadvantage on the electricity market. Whether new plants are built or not, the number of jobs in the mines needs to be reduced if the existing power plants are to be anything like economically viable.

Just transition, however, is not just about the gradual and planned reduction of jobs in the fossil fuel industry. In parallel, it is crucial for communities currently dependent on fossil fuels to start defining their own future and plan for life beyond coal. This is not something that will happen in fifty years - the process is already ongoing, and it is in danger of being an unmanaged decline rather than a planned transition. Towns like Pljevlja and Gacko are

8 <https://corporate.vattenfall.com/press-and-media/press-releases/2016/vattenfall-to-sell-german-lignite-operations/>

9 http://www.focus.si/files/programi/energija/2014/myth_buster_short.pdf

10 See for example: <http://www.ituc-csi.org/what-s-just-transition?lang=en> and <https://www.verdi.de/presse/pressemitteilungen/++co++29a33326-7a86-11e6-a6c7-525400b665de>

11 http://www.ilo.org/wcmsp5/groups/public/---ed_norm/--relconf/documents/meetingdocument/wcms_420286.pdf

12 http://bankwatch.org/sites/default/files/EnCom-state-aid-cases-08Jun2015_0.pdf

13 <http://bankwatch.org/publications/risks-coal-and-electricity-investments-western-balkans-ukraine-and-moldova-due-state-ai>



New coal plants planned in southeast Europe

	Name of plant	Capacity	Status
1	Tuzla 7	450 MW	Planned
2	Banovići	350 MW	Planned
3	Ugljevik III	600 MW	Planned
4	Kakanj 8	300 MW	Announced
5	Gacko II	350 MW	Announced
6	Kostolac B3	350 MW	Planned
7	Pljevlja II	254 MW	Planned
8	Kosova e Re	500 MW	Announced
9	Rovinari 7	500 MW	Announced
10	Ptolemaida V	660 MW	Under construction
11	Meliti II	450 MW	Announced

already suffering from their overdependence on coal, and the answer is not more coal but transformation and diversification.

This paper takes a look at the employment situation at the lignite mines and plants across southeast Europe and the promises regarding future employment levels. The authors of the paper are aware that the calculations below are quite approximate and that each plant and mine has its own characteristics: for example most of the mines are open cast, but a few are underground. However, the aim is to give an overview and to point out a general problem present across southeast Europe: decision-makers offer unrealistic promises about preserving lignite industry jobs. They have not addressed – or in many cases acknowledged – the fact that the number of jobs in the lignite industry needs to be reduced, whether new power plants are built or not.

All the countries have committed to run their energy sectors according to market principles, which means that the electricity industry no longer needs to simply generate electricity, but that it needs to do so at a price that can compete with other producers. Many of the existing plants in the region already have serious financial problems and we expect that lignite will become even less viable in the medium term. However even those who do not share our vision of a decarbonised electricity system need to recognise that the process of creating a just transition away from over-employment in the lignite sector is already long overdue. The longer it is left the more drastic and less just the transition will be. With an earlier start, a better quality social dialogue can take place. More workplaces can be reduced through employees retiring rather than enforced redundancies, and more funds can be raised for ensuring a well-planned sustainable transformation of the mining regions.



WHAT HAPPENED SO FAR WITH NEW LIGNITE PLANTS IN THE REGION

A CAUTIONARY TALE FROM SLOVENIA

14
http://www.focus.si/files/programi/energija/2014/myth_buster_short.pdf

15
http://www.te-sostanj.si/blok6/files/default/blok6/brouura_b6.pdf

16
http://www.rtv.si/si/files/default/Letna%20porocila/LETNO%20POROCILO%20PV%202015_revidirano_avgust%202015.pdf

17
<http://www.focus.si/files/programi/energija/2014/mythbuster.pdf>

18
<http://www.hse.si/en/interesting/news/2016/06/598-Current-proceedings-within-the-HSE-group-focussing-on-the-most-recent-events-at-the-Sostanj-thermoelectric-power-plant>

19
<http://www.te-sostanj.si/nip5/index.html>

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<http://www.eft-stanari.net/sr/tpp-economic.html>, <http://www.nezavisne.com/ekonomija/privreda/Pustena-u-rad-TE-Stanari-vrijedna-milijardu-maraka-FOTO/388209>

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<http://www.vladars.net/sr-SP-Cyrl/Vlada/Premijer/Media/Vijesti/Pages/%D0%9F%D1%80%D0%B5%D0%B4%D1%81%D1%98%D0%B5%D0%B4%D0%BD%D0%B8%D1%86%D0%B0-%D0%A6%D0%B2%D0%B8%D1%98%D0%B0%D0%BD%D0%BE%D0%B2%D0%B8%D1%9B-%D0%BF%D1%80%D0%B8%D1%81%D1%83%D1%81%D1%82%D0%B2%D0%BE%D0%B2%D0%B0%D0%BB%D0%B0-%D0%BE%D1%82%D0%B2%D0%B0%D1%80%D0%B0%D1%9A%D1%83-%D0%A2%D0%95-%D0%A1%D1%82%D0%B0%D0%BD%D0%B0%D1%80%D0%B8.aspx>

22
<http://www.eft-stanari.net/sr/tpp-economic.html>

23
<http://balkans.aljazeera.net/vijesti/stanari-veliki-projekt-ili-veliki-zagadivac>

<http://www.avaz.ba/clanak/196388/stanari-uz-400-kineza-i-400-nasih-radnika?url=clanak/196388/stanari-uz-400-kineza-i-400-nasih-radnika>

Slovenia's 600 MW Šoštanj unit 6 project started in relative obscurity around 2006 but has become one of the most controversial topics in Slovenia in recent years, after massive cost increases doubled the price tag to EUR 1.4 billion and corruption scandals resulted in ten people being charged. Currently the plant is expected to run with losses of EUR 70-80 million annually, at least for the first few years of operations.¹⁴

Among the numerous promises made about the project was that around 3500 workplaces would be preserved for 40 years in the nearby Velenje underground lignite mine.¹⁵

Presumably this figure included indirect employment via the supply of goods and services to the mine, as there were just 1254 people employed in the mine in 2015,¹⁶ but this was never made clear to the public. Indirect employment is a notoriously slippery concept that can include activities clearly linked to the industry in question but often includes occupations like cleaners, caterers and bakers,

who may well operate regardless of whether the leading industry in the region is a coal mine or something else.

The investment programmes for the new unit were more modest in the employment field, as they included only the plant and not the mine. These stated that the Šoštanj power plant as a whole would still employ 450 and 400 people in 2014 and 2015 respectively but from 2028, as unit 5 closes, leaving only unit 6, this number would decrease to 200 workplaces until 2054. However with the Šoštanj 6 project awry, in October 2014, the management of the Šoštanj plant announced its plans to lay off 226 of the 452 employees.¹⁷ This has so far been only partially implemented: on 1 June 2016 Holding Slovenske Elektrarne announced that it expects that the Šoštanj power plant would have no more than 339 employees by the end of 2016.¹⁸

Unit 6 alone employs around 200 people and generates around 3500 GWh of electricity annually,¹⁹ making around 17.5 GWh per person per year.

AND FROM BOSNIA AND HERZEGOVINA

The only other coal power plant in the region to be built in recent years is the 300 MW Stanari plant near Doboj in Bosnia and Herzegovina. The plant has recently begun commercial operations and currently employs 720 people in the mine and plant together. EFT has announced that the complex will eventually employ 900 people.²⁰ The Republika Srpska government however could not resist pumping this number up to 1000 in their statements.²¹

Nevertheless, the construction stage highlights issues that are likely to be relevant for other plants in the region. For the construction stage 1200 workplaces were promised.²² In reality, the figures cited by the media once construction was underway suggested that there were about 400-450 workers from BiH, along with 350-400 Chinese workers.²³ In other words, little more than one third of the proclaimed workplaces for construction materialized for local workers.

EMPLOYMENT TRENDS IN THE EU LIGNITE SECTOR

GERMANY

Germany is often cited in southeast Europe as an example of the EU's continuing use of lignite. But the question is: for how much longer? Germany is not planning to build any new coal power plants and plans to satisfy at least 35 per cent of its electricity consumption from renewable energy by 2020, at least 50 per cent by 2030 and at least 80 per cent by 2050 (with 60 per cent of total energy from renewables).²⁴

A closer look shows that even with much more efficient production than in southeast Europe, Germany's lignite sector is currently uneconomic.

In the last two decades, Germany has undergone a massive reduction in the number of people employed in the lignite industry. In 1989 there were 156 731 employees in the lignite mining sector across Germany.²⁵ By 2012 this figure had dropped to 16 622.²⁶ Most of the job losses took place in the former East Germany, as one might expect, but even in the Rhineland the number

of workplaces dropped by almost a third.²⁷

Given total German lignite production of 185.4 million tonnes in 2012, it appears that productivity per person reached 11 154 tonnes per worker that year.²⁸ This does not appear to be evenly spread, as Vattenfall had 8200 employees within its Lusatian operations in 2014, and production of 63.6 million tonnes of lignite in 2013. So this would be nearer to 7756 tonnes per person per year.²⁹

Around 5700 people were employed in lignite power plants in Germany in 2013, and the plants generated around 161 000 GWh - around 28.2 GWh per employee.³⁰

As we will see later, this is many times more efficient than the lignite industry in southeast Europe. Yet even with such apparently high efficiency, Vattenfall is selling its lignite power plants and mines in Germany and expects to take a loss of EUR 2.4-2.9 billion. The company still considers this cheaper than keeping hold of them.³¹

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<http://www.bmwi.de/BMWi/Redaktion/PDF/V/viertel-monitoring-bericht-energie-der-zukunft,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf>

25
http://www.braunkohle.de/index.php?article_id=98&fileName=debriv_statistikfaltblatt_en_20140205.pdf

26
<http://euracoal.eu/info/country-profiles/germany/>

27
http://www.braunkohle.de/index.php?article_id=98&fileName=debriv_statistikfaltblatt_en_20140205.pdf

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<http://euracoal.eu/info/country-profiles/germany/>

29
<http://corporate.vattenfall.com/press-and-media/news/2014/lignite-in-numbers/>

30
<http://corporate.vattenfall.com/press-and-media/news/2014/lignite-in-numbers/>

31
<https://corporate.vattenfall.com/press-and-media/press-releases/2016/vattenfall-to-sell-german-lignite-operations/>

POLAND

Poland has also seen significant changes in its lignite industry over the past 15 years. In 2001 there were a total of 24 020 workers in lignite mines, producing 2500 tonnes of coal per employee per year. By 2013 the number of miners had decreased to 13 598 but they produced 4800 tonnes of coal per employee per year - a 92 per cent increase of productivity.³² By the end of 2015 a more rapid increase in efficiency took place. According to the Polish Mining Authority, 63 401 900 tonnes of lignite were produced at

12 mines, and the number of people employed was 6274,³³ making up 10 105 tonnes of lignite per worker.

In 2012, Poland had 9.6 GW of installed lignite generation capacity, which generated 55 600 GWh.³⁴ Country-wide data on average generation per employee was not found, but Poland's largest power plant, Belchatow, had 3 270³⁵ employees at the end of 2015 and generates around 34 000 GWh per year,³⁶ making around 10.4 GWh per employee per year.

32
<http://www.ppwb.org.pl/wb/86/7.php>

33
http://www.wug.gov.pl/english/supervised_plants

34
<https://euracoal.eu/info/country-profiles/poland/>

35
<https://www.elbelchatow.pgegiel.pl/index.php/o-oddziale/pracownicy/>

36
<https://www.elbelchatow.pgegiel.pl/index.php/o-oddziale/>

37
<http://euracoal.eu/info/country-profiles/czech-republic/>

38
[http://www.ey.com/Publication/vwLUAssets/EY_European_Lignite_Mines_Benchmarking_2014/\\$FILE/EY-European-Lignite-Mines-Benchmarking-2014.pdf](http://www.ey.com/Publication/vwLUAssets/EY_European_Lignite_Mines_Benchmarking_2014/$FILE/EY-European-Lignite-Mines-Benchmarking-2014.pdf)

CZECH REPUBLIC

In 2012, the Czech Republic produced 43.5 million tonnes of lignite. The sector employed

9093 workers, equalling 4784 tonnes per worker per year.³⁷

OTHER EU COUNTRIES

In 2014, Ernst and Young published a benchmarking report examining seven top lignite producers in Europe, including 20 open cast mines in total, from Bulgaria, Czech Republic, Greece, Hungary, Poland and Romania. The results are anonymised so it is not possible to know which companies were involved or which countries had which results, but the benchmarking findings demonstrated a production cost ranging from EUR 5.1 to 20.3 per tonne. This is mainly affected by the geological characteristics of the mine and the volume produced. The average lower calorific

value of the mines ranges from approximately 1100 to 4200 Kcal/Kg, leading to a range of production cost per Gcal of 3.2 to 10.4 EUR/Gcal. Productivity per employee varies massively, from 1 626 tonnes per year per employee to 11 192.³⁸

These figures can be applied to the southeast European mines below to see how they measure up, however due to the anonymity of the survey it cannot be assessed whether all of these lignite producers are economically feasible or not.

BOSNIA AND HERZEGOVINA

Bosnia and Herzegovina (BiH) has for several years been a net exporter of electricity to neighbouring countries like Croatia and Montenegro. However its lignite sector is marked by a very low level of efficiency in terms of both electricity generation and mining. Costs of electricity have so far been kept down by failing to invest sufficiently in pollution control equipment and by power plants paying prices for coal that do not cover production costs, meaning that the mines have had to be subsidised.³⁹

A lack of capital investments in new generation capacity has also delayed increases in electricity prices. However this situation now has to change as in 2016, the average age of BiH's coal power plants is 39 years old, and during the next few years they either have to be retrofitted to comply with the Large Combustion Plants Directive or closed. With energy efficiency measures, electricity demand can be reduced, but in any case investments

in generation will need to be made, inevitably raising the price of electricity.

At the same time, BiH's participation in the Energy Community means that it has to open its electricity market and will be exposed to competition from countries like Bulgaria and Romania – which are net exporters of electricity – so there will be pressure to keep prices down. BiH therefore needs to weigh carefully which investments are worth making and which are in danger of ending up as stranded assets due to their high investment and operational costs. Amer Jerlagić, former Director of the Elektroprivreda BiH utility (EP BiH) has recently backed this point, saying that with prices at EUR 35-40 MWh across Europe, depending on the electricity exchange, it is questionable whether BiH needs the planned units at Tuzla 7 or Banovići.⁴⁰ Even the current Director of EP BiH, Bajazit Jašarević, has recently admitted that both plants are currently unfeasible.⁴¹

39 <http://bankwatch.org/sites/default/files/EnCom-state-aid-cases-08Jun2015.pdf>

40 <http://www.zurnal.info/novost/19890/pogledajte-film-vladar-iz-podzemlja-omirsadu-kukicut>

41 <http://www.energetika.ba/termoenergija/12161-jos-malo-priprema-za-blok-7-exim-banka-zeli-provjeriti-poslovanje-ep-bih.html>

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43 <http://www.ers.ba/images/stories/izvjestaji/mh2014osn.pdf>

44 <http://www.usaideia.ba/wp-content/uploads/2015/12/prezentacija-eprs.pdf>

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REPUBLIKA SRPSKA

Ugljevik power plant - existing

The Ugljevik mine and power plant complex consists of a 300 MW lignite-fired power plant and the Bogutovo Selo opencast mine, as well as a half-built second unit that was never finished due to the collapse of Yugoslavia. A new 2x300 MW unit is planned (usually known as Ugljevik III) by Comsar Energy, along with new opencast mines.

Ugljevik I started operating in 1985 and in 2014 generated 1591 GWh,⁴² while the mine produced 1 750 170 tonnes of lignite.⁴³ It is projected that the plant will operate until

2039,⁴⁴ although this will depend on whether it is considered economic, and does not seem particularly likely given its current financial woes. In 2014 the mine and power plant company reported losses of EUR 5.5 million, rising to EUR 9 million in 2015.⁴⁵ In the first half of this year reported losses stood around EUR 4.5 million.⁴⁶ The plant also needs investments to comply with the EU's Large Combustion Plants and Industrial Emissions Directives, which will further increase operating costs.

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<http://www.narodnaskupstinars.net/?q=la/narodna-skupstina/poslanicka-pitanja-i-odgovori/narodni-poslanik-miladin-stani%C4%87-ministarstvu-industrije-energetike-i-rudarstva>

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<http://www.capital.ba/ers-priznala-samo-prosle-godine-zaposleno-600-novih-radnika/>

49
<http://comsar.com/projects-technologies/hpp-ugljevik/engine-local-economy>

50
<http://comsar.com/pressnews/press/comsar-energy-signed-epc-contract-china-power-engineering-and-consulting-group>

51
Environmental Impact Assessment for Ugljevik III power plant p.108, final version

52
<http://www.nosbih.ba/files/dokumenti/Indikativan%20plan%20razvoja/2016/IPRP%202017-2026%20-%20Prijedlog.pdf>

53
Environmental Impact Assessment for Ugljevik III power plant, final version

54
<http://bankwatch.org/sites/default/files/Sostanj-TE56-economics.pdf>

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<http://www.narodnaskupstinars.net/?q=la/narodna-skupstina/poslanicka-pitanja-i-odgovori/narodni-poslanik-miladin-stani%C4%87-ministarstvu-industrije-energetike-i-rudarstva>

<http://www.capital.ba/ers-priznala-samo-prosle-godine-zaposleno-600-novih-radnika/>

56
<http://www.ritegacko-rs.ba/en/o-nama/ljudski-resursi/>

57
<http://www.ers.ba/images/stories/izvjestaji/mh2014osn.pdf>

58
<http://www.ers.ba/images/stories/izvjestaji/mh2014osn.pdf>

59
<http://www.ritegacko-rs.ba/termoelektrana/ostvareni-rezultati-2/>

A breakdown of how many employees work at the mine vs. the power plant does not appear to be publicly available. For the Ugljevik mine and power plant the number of employees in 2013 were 1851 and 1915 in 2014.⁴⁷

This latter figure is notable as 67 people were recruited in 2014, an election year, a pattern which was repeated across Elektroprivreda Republike Srpske, which employed no less than 601 new workers during that year.⁴⁸

Ugljevik III, the new plant planned by Comsar Energy, is claimed by the company to lead to 800 new job openings.⁴⁹ However Comsar does not specify whether these would be permanent or temporary and whether they would be for the mine or power plant. For the construction phase this figure seems feasible, based on the experience with Stanari, but it would be useful if the company indicated how many of these jobs would be available to people from BIH. The China Power Engineering and Consulting Group Corporation (CPECC) was contracted for the construction works,⁵⁰ and Chinese companies usually bring at least a proportion of their own workers with them.

The environmental impact assessment predicts 303 workers for the plant itself,⁵¹ which is possible but on the high side compared to Šoštanj 6, also a 600 MW plant that is projected to have around 200 workers once the other units close. If the plant generates 3371 GWh annually as forecasted,⁵² this would only result in 11 GWh per worker per year, which would be comparable to Belchatow in Poland. But Belchatow also comprises several old units, so should not be a standard for a new plant. Šoštanj 6 generates 17.5 GWh per worker and at German lignite plants the average is 28.2 GWh, however they are still having financial problems.

Therefore the number of employees predicted for Ugljevik III seems impossibly high. On one hand it is possible that more employees per unit of output would be needed than at Šoštanj 6, since the net thermal efficiency would be much lower (34.1 per cent⁵³ compared to 43 per cent at Šoštanj 6⁵⁴), but on the other hand, the lower thermal efficiency will also disadvantage the plant on the market.

Gacko power plant – existing

The existing power plant at Gacko started operating in 1983 with a capacity of 300 MW and is planned to operate until 2035. In order to do so, it would have to improve its financial performance significantly and be refitted in line with the EU Large Combustion Plants and Industrial Emissions Directives.

The mine and power plant together employed 1600 people at the end of 2013 a year later this had increased to 1774, presumably as a result of 2014 being an election year, as mentioned above for Ugljevik.⁵⁵

A breakdown of the employment figures for 2013 shows that 689 people were employed in the mine, with 411 in the power plant. A further 150 were employed in technical services shared between the mine and power plant, 284 in 'independent sectors' and 66 in 'social standards'.⁵⁶

Comparing the 689 mine personnel with the mine production for 2013 - 2 480 622 tonnes⁵⁷ - results in 3 600 tonnes per person for the year, which appears to show that it is more productive than other mines in BIH. However it depends on how many of the technical services and other workers should be included in the mine figures. If we add half of them (75 + 142 + 33) to the 689 people directly employed by the mine, we arrive at 939 and the tonnes per person decreases to 2641. Considering that production went down in 2014 to 2 272 747 tonnes⁵⁸ and the number of workers went up, production levels have been decreasing rather than increasing.

The number of workers in the power plant is high considering the power output. German lignite plants generate around 28.2 GWh per employee per year. Gacko, with 411 people directly employed in the power plant in 2013 and an output of 1773 GWh⁵⁹, manages only 4.3 GWh per employee per year. This is far below even Belchatow in Poland with its 10.4 GWh per employee per year.

A new power plant has also been announced at Gacko, however the authors are not aware that any claims have been made yet about the jobs this would preserve or create, so it is not included here.



FEDERATION OF BOSNIA AND HERZEGOVINA

Of the Federation's two public electricity companies, Elektroprivreda BiH (EP BIH) and Elektroprivreda HZHB (EP HZHB), only the former owns coal power plants and mines, although EP HZHB occasionally expresses aspirations of building a plant at Kongora near Tomislavgrad. Banovići coal mine near Tuzla is also majority state-owned, and the company plans to build a coal power plant at the site.

EP BIH owns the Tuzla coal power plant, which is fed by the Kreka, Đurđevik and Banovići mines, and the Kakanj plant fed by the Kakanj, Breza, Zenica, Gračanica and Bila mines.⁶⁰ EPBIH, unlike some of the other companies in the region, has admitted for years that it needs to reduce the number of workers, and in 2008 a law on coal mine consolidation⁶¹ was passed in order to provide BAM 272 million (EUR 136 million) in subsidies while the company restructured.⁶²

In reality though, the money was provided, but there has not been substantial restructuring. EP BIH's projections about how much of a reduction in the workforce are needed also appear unrealistically low. In the long-term, the company estimates that a 25 per cent reduction is needed compared to 2012 for the mines, in order to reach 7 200.⁶³ Along with production improvements, it believes that this would double efficiency. The company also speculates that in the long term, after this stabilisation period, if there is an increase in production, it would also be possible to take on more workers. As we will see, all this seems optimistic.

Recently there have been reports of increased productivity at EP BIH's mines and a decrease in overall employment in EP BIH,⁶⁴ but it is too early to tell whether these are temporary or whether changes are finally starting to take place.

60 <http://www.elektroprivreda.ba/upload/documents/odluke/dugorocni-plan.pdf>, p.224

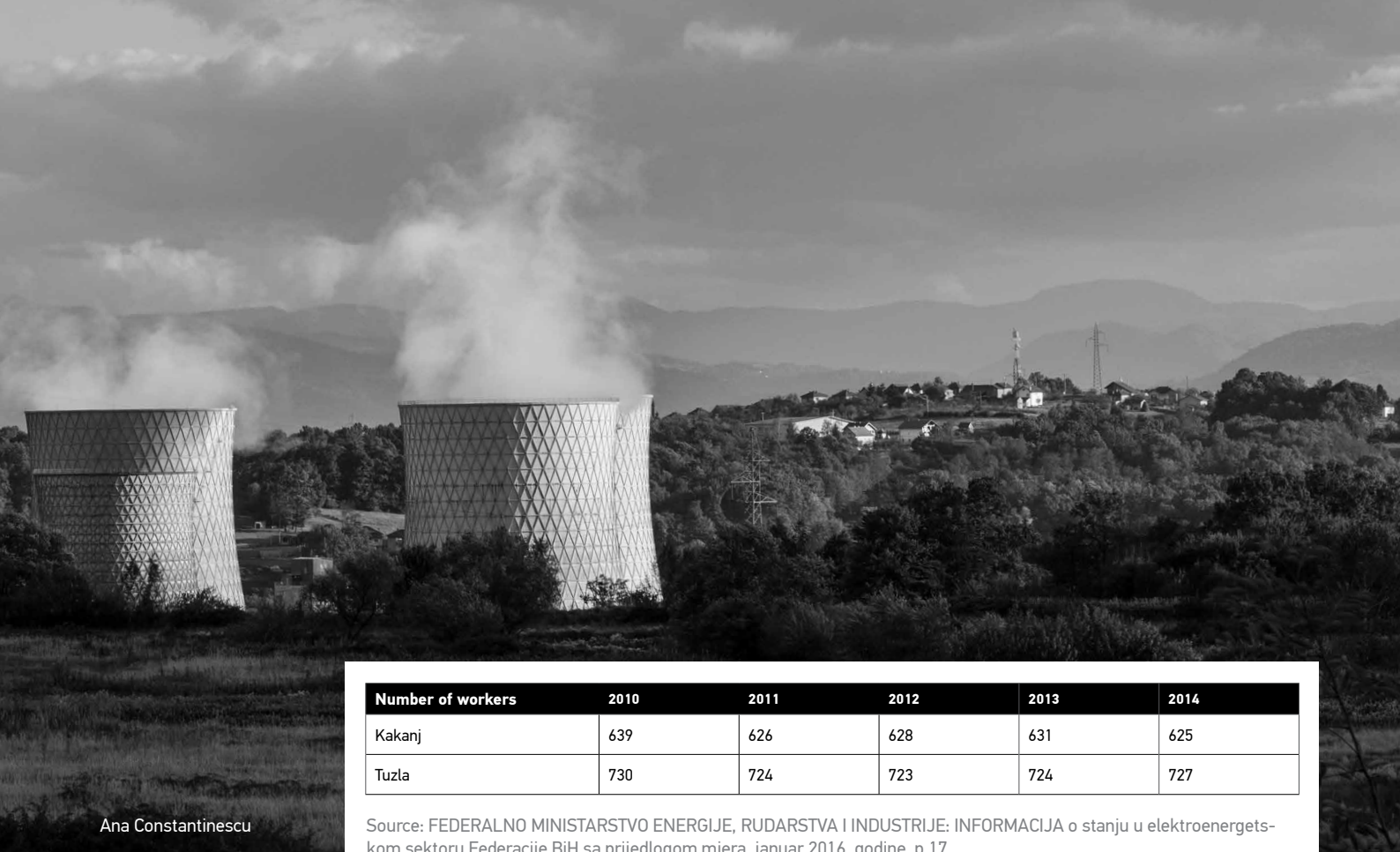
61 Zakon o finansijskoj konsolidaciji rudnika uglja u Federaciji Bosne i Hercegovine prema obračunatim, a neuplaćenim javnim prihodima u periodu od 2009. do 2015. godine

62 <http://www.elektroprivreda.ba/upload/documents/odluke/dugorocni-plan.pdf>

63 <http://www.elektroprivreda.ba/upload/documents/odluke/dugorocni-plan.pdf>, p.257

64 <http://www.avaz.ba/clanak/255784/rudari-obaraju-rekorde?url=clanak/255784/rudari-obaraju-rekorde>,

http://www.elektroprivreda.ba/upload/documents/tacka_2_dnevnog_reda_Usvajanje_lzvjestaja_o_poslovanju.pdf



Ana Constantinescu

Number of workers	2010	2011	2012	2013	2014
Kakanj	639	626	628	631	625
Tuzla	730	724	723	724	727

Source: FEDERALNO MINISTARSTVO ENERGIJE, RUDARSTVA I INDUSTRIJE: INFORMACIJA o stanju u elektroenergetskom sektoru Federacije BiH sa prijedlogom mjera, januar 2016. godine. p.17

65
http://www.elektroprivreda.ba/upload/documents/GI_bosanski_2014.pdf

66
<http://www.elektroprivreda.ba/stranica/organizacija-drustva>

<http://www.elektroprivreda.ba/upload/documents/materijali286MB.pdf>

67
<http://www.federalna.ba/bhs/vijest/162552/vmbih-dalo-zeleno-svjetlo-strateskom-partneru-iz-kine>

68
<http://www.elektroprivreda.ba/upload/documents/materijali286MB.pdf>

69
<http://www.energetika.ba/termoenergija/12161-jos-malo-priprema-za-blok-7-exim-banka-zeli-provjeriti-poslovanje-ep-bih.html>

70
<http://www.usaideia.ba/wp-content/uploads/2015/10/Prezentacija-EPBiH-NERP-Ugljevik-20.10.2015..pdf>

Tuzla units 3-6 – existing

Tuzla power plant units 3-6 have a total capacity of 715 MW and output of around 3100 GWh annually. In 2014 the plant had 727 employees.⁶⁵ This means that Tuzla generates 4.2 GWh per employee, while Šoštanj 6 generates 17.5 GWh. If Tuzla was to achieve 17.5 GWh per employee, it would need around 177 employees. Since the existing units 3-6 at Tuzla are planned to gradually close during the next fifteen or so years, the number of employees would be further reduced.⁶⁶

Tuzla unit 7 450 MW – planned

One of the justifications given for constructing Tuzla 7 is employment: “Salvation for 4000 workers from the Kreka mine, but also the whole BiH energy system”, proclaimed one rather optimistic news item on the project,⁶⁷ even though Kreka had only 3010 workers in 2014 and will need to decrease this number in the future.

The environmental impact assessment does not give the number of expected workers for the Tuzla 7 unit itself but mentions 800 workers, which presumably includes the existing units

as well. The projected generation per year is 2632 GWh.⁶⁸ Tuzla 7 is planned despite the fact that it is currently financially unfeasible due to low electricity prices.⁶⁹ Therefore if built, it can be assumed that the number of employees will be kept to an absolute minimum in order to minimise losses.

Kakanj units 5-7 – existing

In 2014 there were 625 workers at the Kakanj thermal power plant. With generation of 2300 GWh per year, this makes only 3.68 GWh per employee, while Belchatow generates 10.4 GWh annually per person and Šoštanj 6 generates 17.5 GWh per person. If Kakanj’s output per employee were to equal to Belchatow’s there would be only 221 employees, or if it was equal to Šoštanj 6’s, there would only be 131. Kakanj is planned to operate until 2027 (unit 5) and beyond 2030 (units 6 and 7),⁷⁰ however this depends whether it will be economic to do so.

An eighth unit is planned at Kakanj, but as yet the authors are unaware of any claims about employment made regarding the plant, so it is not covered here.

EP BIH mines supplying Tuzla power plant

Kreka mine

The Kreka mine, which supplies the Tuzla power station, consists of the Šikulje and Dubrave opencast lignite mines and the Mramor underground mines. In 2013 the mines produced 2 109 000 tonnes of lignite and had 3255 employees, with a production rate of 648 tonnes per employee per year. In 2014 the situation was even worse, at 622 tonnes per year,⁷¹ presumably as a result of the Šikulje mine being flooded by the devastating May 2014 floods.

Đurđevik

In 2014 the Đurđevik mine, which supplies the Tuzla power plant, produced around 466 000 tonnes of brown coal, with 945 employees, making only 493 tonnes per employee.⁷²

EP BIH mines supplying Kakanj power plant

Kakanj

The Kakanj mines consist of the Vrtlište opencast mine and Haljinići underground mine. In 2014, 1906 people were employed in the mines, producing 1 100 000 tonnes of brown coal – in other words, only around 577 tonnes of coal per employee.⁷³

Zenica

The Zenica underground brown coal mines consist of Stara jama, Raspotočje and Stranjani

and supply the Kakanj power plant. In 2014, 292 000 tonnes of brown coal were produced by the mines' 1469 employees, so 199 tonnes per person.⁷⁴ This particularly low figure might be regarded as a consequence of the tragic accident at the Raspotočje mine on 4 September 2014 in which five miners died.⁷⁵ However the 2011-2013 figures of 222-231 tonnes per person do not suggest that usual production is much higher. Recently it has been reported that new machinery has been purchased for Raspotočje, which should help to increase production. However at the same time, expectations are being raised about additional employment at the mine, from 360 to 500 workers, if production increased to 30 000 tonnes per month.⁷⁶ Such promises seem unrealistic.

Breza

The Breza mine consists of the Sretno and Kamenice underground brown coal mines and supplies Kakanj power plant. It was planned to produce 600 000 tonnes annually but in reality average production is around 450 000 tonnes. The total number of employees in 2014 was 1262, producing only 361 tonnes of coal each.⁷⁷

„Abid Lolić“ d.o.o. Travnik – Bila

This includes the Grahovčići underground and opencast mine and supplies the Kakanj power plant. Brown coal production in 2014 was 177 000 tonnes and the number of employees was 354 in 2014, making 500 tonnes per person.⁷⁸

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http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/EL_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf

72
http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/EL_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf

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http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/EL_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf

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http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/EL_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf

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<http://www.fmeri.gov.ba/ukopani-rudari-koji-su-poginuli-u-jami-raspotocje.aspx>

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<http://www.federalna.ba/bhs/vijest/176252/video-u-završnoj-fazi-nabavka-opreme-vrijedne-20-miliona-km>

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http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/EL_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf

78
http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/EL_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf

EPBIH mines employment and production levels.

Number of workers	Total no. of employees					Productivity tonnes/employee				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
Kreka	3872	3657	3475	3255	3010	598	723	718	648	622
Đurdevik	1147	1106	1037	972	945	456	540	565	495	493
Kakanj	2092	2024	1952	1989	1906	514	552	596	543	577
Zenica	1423	1439	1508	1504	1469	139	222	224	231	199
Breza	1255	1265	1268	1252	1262	342	366	373	369	361
Bila	292	280	276	280	354	324	367	425	571	500
Gračanica	210	210	209	200	199	1206	1213	1471	1320	1754
Average						475	551	563	519	515

Source: Federalno Ministarstvo Energije, Rudarstva i Industrije: Informacija o stanju u elektroenergetskom sektoru Federacije BiH sa prijedlogom mjera, January 2016.

Gračanica, Gornji Vakuf – Uskoplje

This supplies Kakanj with lignite and comprises the Dimnjače opencast mine. Annual production in 2014 was around 349 000 tonnes, and there were 199 employees, making 1754 tonnes per person - by far the highest in EP BIH but still much lower than production levels in other countries.

Banovići plant, 350 MW, planned

According to the 2015 environmental impact assessment for the plant, 1706 GWh will be generated annually. This is extraordinarily little if one considers that Stanari, which is 50 MW smaller and has a low net efficiency of 34.1 per cent, is expected to generate 2000 GWh. Indeed the BIH independent system operator's indicative generation capacity plan 2017-2026 expects 2200 GWh.⁷⁹

There are also inconsistencies with the number of people to be employed. On one page (31) the environmental impact assessment it states 200 people,⁸⁰ while later (156) it says 250. Even if we accept that the number is 200 and generation 2200 GWh, generation per employee would be 11 GWh annually per person, much lower than Šoštanj 6 or the German average. If its productivity was similar to Šoštanj 6, only 125 workers would be needed.

Banovići mine

Around 70 per cent of the brown coal from the Banovići underground and opencast mines is sold to the Tuzla power plant⁸¹, primarily for Unit 6. The Banovići mining company's website states that 2798 people are employed at the mine in 2016 and that 1 328 169 tonnes of coal were mined in the previous year,⁸² making only 474 tonnes per person.

79
<http://www.nosbih.ba/files/dokumenti/Indikativan%20plan%20razvoja/2016/Juli%202016/IPRP%202017-2026%20-%20Final.pdf>

80
 Rudarski institut d.d. Tuzla: IZMJENE I DOPUNE STUDIJE O UTICAJU NA OKOLIŠ ZA TE „BANOVIĆI“, Tuzla, May 2015, p.31

81
<http://rmub.ba/onama.html>

82
<http://rmub.ba/onama.html>

GREECE

In spite of the automatic association one tends to make when thinking of Greece – that of sunny beaches and therefore the potential for abundant renewable energy – the country's electricity generation is still very much reliant on lignite. Greece is second only to Germany in the EU for lignite coal production⁸³. Lignite is virtually the only fossil fuel available in Greece. The country imports 100 per cent of the natural gas and 98 per cent of the oil consumed nationally, with an energy dependency rate as high as 62.1 per cent (2013) as opposed to an average 53.2 per cent for the EU-28.⁸⁴ In the interconnected power grid of mainland Greece, the share of lignite in electricity consumption has decreased in the last ten years from 63 per cent in 2004 to 45 per cent in 2014. This decrease has been offset by an increase in the shares of RES and hydropower (from 11 to 25 per cent) as well as imports.

Apart from a very small amount of private mining, all production is carried out by the mining division (DEI) of the Public Power Corporation (PPC). PPC is Greece's main electricity provider, with an approximate 95 per cent share of Greece's total electricity supply. Exclusive rights for the production of electricity from lignite are granted to PPC, now a public company traded on the Athens and London stock exchanges, but in which the Greek government holds a 51 per cent share.

Total annual lignite extraction reached its peak in 2004 at 72 million tonnes⁸⁵, before dropping to 48 million tonnes in 2014⁸⁶.

Based on current data, the exploitable lignite reserves in the country total approximately 3.2 billion tonnes. The main deposits are located in:

- Western Macedonia (Ptolemaida, Amynteo and Florina) with estimated reserves of 1.8 billion tonnes;
- the Peloponnese (Megalopoli), with reserves around 223 million tonnes;

- Drama, with reserves of 900 million tonnes; and
- Ellassona, with 169 million tonnes.

Of these deposits, the ones in Drama and Ellassona remain unexploited⁸⁷.

The installed capacity of electricity generation at lignite-fired plants in Greece stood at 3 912 MW as of August 2015⁸⁸.

The permanent employment figures in lignite mining across the country, along with lignite production, have been trending downwards, from 4108 in 2011 to 3417 in 2014⁸⁹. This places the average productivity per miner per year at 14 710 tonnes, an absolute record in the scope of this report.

PPC's employment figure at the electricity generation end stood at 4 756 in 2014, while it produced 22 790 GWh⁹⁰ of electricity, a hypnotising number compared to the rest of the region, but an all-time low in Greece's history. This translates into a productivity level of 4.79 GWh/employee/year, way lower than for example in Slovenia (17.5) or Germany (28.2).

These two productivity figures present an intriguing paradox: on the one hand Greece has the highest productivity level when it comes to lignite mining, but on the other, it has one of the lowest levels when it comes to generated electricity per worker. Presumably, there is some compensation within the PPC Group, so that one part of the production chain can still keep employment numbers at an artificially high level and claim it is a major source of job creation and maintenance.

In order to comply with the Industrial Emissions Directive, the oldest and most polluting lignite-fired plants will have to be shut down. This means that after 2023, only the four more modern plants will be operational, with a total capacity of 2256 MW.

83 <https://www.worldenergy.org/data/resources/country/greece/coal/>

84 https://gr.boell.org/sites/default/files/hbsgr_lignitis_lignite_2015.pdf

85 <http://energytransition.de/2016/02/lignite-in-the-greek-energy-system-facts-and-challenges/>

86 PPC annual report, https://www.dei.gr/Documents2/INVESTORS/ANNUAL%20REPORTS/2014/Annual%20Report%202014%20GR_TOTAL_Digital_LOW.pdf, page 15

87 https://www.dei.gr/Images/mining-map-large_en.gif

88 https://gr.boell.org/sites/default/files/hbsgr_lignitis_lignite_2015.pdf, page 8

89 PPC's annual report, https://www.dei.gr/Documents2/INVESTORS/ANNUAL%20REPORTS/2014/Annual%20Report%202014%20GR_TOTAL_Digital_LOW.pdf, page 15

90 Independent Power Transmission Operator: <http://www.admie.gr/deltia-agoras/miniaia-deltia-energeias/>

Unit V of Ptolemaida Station - new unit, under construction

91
<http://tdm.tee.gr/wp-content/uploads/2015/04/paremvasi-tee-tdm-anaforika-me-tin-kataskeyi-tis-monadas-ptolemaida-v.pdf>

92
<http://www.welt.de/wirtschaft/article118285358/Bund-buergt-fuer-Braunkohlekraftwerk-in-Griechenland.html>

93
<http://www.hellenicparliament.gr/UserFiles/67715b2c-ec81-4f0c-ad6a476a34d732bd/9668159.pdf>

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<http://www.berliner-zeitung.de/energie/wendetrotz-energie-wende-und-eu-klimaziel-schwarz-gelb-foerdert-klimakiller-in-griechenland,10808242,22174884.html>

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http://www.die-klima-allianz.de/wp-content/uploads/2013/09/kfW-coal-briefing_April2013_EU.pdf

96
<https://www.dei.gr/en/anakoinwseis/xrimatistiriaka-etairikes-prakseis-katavoli-merismatos-ka/xrimatistiriakes-anakoinwseis-2016/upegrafi-to-mnimonio-sunergasias-me-tin-cmec>

With an installed capacity of 660 MW (+ 140 MWth for district heating), this plant is planned to use pulverized lignite fuel and has so far received an installation license issued by the Ministry of Productive Reconstruction, Environment and Energy in April 2015 and a construction permit in July 2015. The construction of the unit is supposed to be completed within 50 months from the date of issue of the construction permit, according to PPC's website.

For this unit it is said that 250 permanent jobs would be created, according to the 2011 environmental impact assessment, which seems to be a fair estimate if we look at Šoštanj 6, and 820 indirect jobs according to the Technical Chamber of Greece, Division of Western Macedonia.⁹¹

Some media reports quote a staggering 2500 jobs that would be created during the construction phase⁹². It is unclear how long these jobs last and whether they are direct or indirect. However, in a recent response⁹³ to a parliamentary question, PPC's CEO claimed that 1000 jobs will be created during the construction phase, a significant downgrade from the 3500 that PPC had initially promised and the 2500 figure which was the latest reported in the media. There is also an article claiming that according to the German Ministry of Finance, during the construction phase and until 2017, 1150 of these jobs will be created in Germany⁹⁴. The German investment bank KfW will fund the consortium that has

undertaken the construction of the plant with EUR 200 million⁹⁵ of the total estimated cost of EUR 1.6 billion. This is much like the situation in the Western Balkans, where many of the temporary jobs in Chinese-financed projects go to Chinese workers.

According to the 2011 environmental impact assessment, the new Ptolemaida V unit will operate 7000 hours (capacity factor 80 per cent), will produce 4620 GWh (gross) and 4160 GWh net per year (the plant's own consumption is approximately 500 GWh per year). The maximum electrical efficiency will be 41.5 per cent, therefore not meeting the standards laid out in the 2006 Large Combustion Plant Directive BAT reference document. If the 250 permanent jobs figure listed in the EIA report is accurate, this unit's generation productivity would be at 18.48 GWh/ person. However, in the same answer to the parliamentary question mentioned above, the company's CEO mentions 430 permanent jobs, which would translate into a lower productivity of 10.74 GWh/employee, higher than in the rest of the Balkans but still way below that in Germany, which is ironic, considering Germany's role in the realisation of this project.

Recently a memorandum of understanding was signed between PPC and China's CMEC for the construction of a new unit at the Meliti plant in Florina.⁹⁶ However no claims are known to have been made by the company or authorities regarding the employment levels at the plant.





Jagoda Munic

KOSOVO

Kosova A, existing plant, 2x200 MW + 1x210 MW operating

The Kosova A power plant near Prishtina consists of five installed units, of which only three are still operating. Kosovo has committed to close the plant by the end of 2017⁹⁷ due to its high levels of pollution, though some government documents foresee the plant operating longer⁹⁸ due to the fact that very little generation capacity has been added in Kosovo in recent years:

1905 GWh was generated in 2015.⁹⁹ It is not clear how many people currently work at the plant, as the latest figures are from January 2010, when 777 people worked there.¹⁰⁰ A European Commission study estimates that 600 people would be a more appropriate number,¹⁰¹ but it is not clear whether the number of employees has been reduced since then.

The same Commission study estimated how many people would be needed for the decommissioning works at Kosovo A and found the following:

- Decommissioning engineering: 30 engineers for 3.5 years
- Preparation and cleaning works: 100 unskilled workers for 1.5 years
- Safety measures: 25 maintenance workers plus 50 unskilled workers for 1.5 years
- Disaggregation works: 50 skilled workers plus 50 unskilled workers for 2.5 years

- Demolition works: 50 skilled workers plus 50 unskilled workers for seven years

In other words, a fairly large proportion of the workers at the existing plant could also be employed for decommissioning for some time. Although this would be temporary, it would help cushion the impacts of the closure by reducing the workforce more gradually.

Kosova B, existing plant, 2x339 MW

The two units of Kosova B generated 3556 GWh in 2015.¹⁰² No data was found about the current number of employees, but in January 2010 there were 705 workers.¹⁰³ The aforementioned EU study estimates that the plant only really needs 500 employees for its operation,¹⁰⁴ but it is not clear whether a reduction in staff numbers has taken place. Even with 500 employees, the plant would generate only 7 GWh per worker per year.

Kosovo C/Kosova e Re, 500 MW, planned

Plans for a new Kosovo C lignite power plant have been around for more than a decade, and have gradually shrunk from 2000 MW¹⁰⁵ to current plans for 500 MW¹⁰⁶ (450 MW net)¹⁰⁷. Little concrete information about the

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http://mzhe-ks.net/repository/docs/HLFSOS_-_MED_presentation.ppt

98
http://mzhe-ks.net/repository/docs/Balanca_e_energji_2015-2024_eng.pdf

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http://mzhe-ks.net/repository/docs/HLFSOS_-_MED_presentation.ppt

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project is available, as talks with the one and only bidder, ContourGlobal, are still ongoing at the time of writing, and no environmental and social assessment has yet been carried out yet. The Kosovo government expects 3370 GWh of electricity to be generated per year by the new plant,¹⁰⁸ but no official information is available about expected employment and no agreements appear to be in place to ensure a certain percentage of local labour will be used.

ContourGlobal may be the regional prize winner for most outrageous claims regarding coal plant employment. In February 2015, when the project was still planned to have a capacity of 600 MW, the company's executive vice president, Garry Levesley, promised 10 000 workplaces during construction and 500 once the plant comes online.¹⁰⁹ If we consider that the Stanari power plant in BiH required around 800 workers during the construction stage, there is no reason why a plant with twice as much capacity as Stanari would require more than ten times as many workers. Nor is there any explanation for why a plant with a similar capacity to Šoštanj 6 in Slovenia would require two and a half times more employees.

Sibovc mine - existing, to be extended

The main field currently being exploited is the South West Sibovc field. The coal

production division of Kosovo's public electricity company, KEK, currently has 3249 employees.¹¹⁰ In 2014 the mine produced 7.2 million tonnes of lignite and 8.2 million tonnes in 2015.¹¹¹ This means 2216 tonnes per employee in 2014 and 2523.8 tonnes in 2015, making it one of the more efficient mines in the region per employee but still very low-efficiency by central European standards, with Germany at 11 154 tonnes per year per employee, Poland at 10 105 tonnes, and the Czech Republic much lower at 4784 tonnes.

It has been estimated that if maintenance, overhauls and production of mining equipment was outsourced, the mine would need about 2 000 employees.¹¹² Some of these jobs would stay in Kosovo, while it is likely that some would not.

There is no clear data available on the necessary lignite production if the Kosova e Re plant was to be built. On one hand the fact that it would generate more electricity than Kosova A (3370 vs. 1905 GWh) may indicate that more coal would be needed, however the efficiency of the new plant would be higher than the ancient Kosova A and therefore may not require much more coal, if any. If this is the case, then not only would new mining jobs not be created, but as we have seen above, the number of workers could easily be reduced if it is decided to outsource some tasks.

MACEDONIA

Macedonia stands out in southeast Europe as one of the countries with the least diversified energy mix, relying predominantly on fossil fuels (low-grade lignite and oil) and hydropower, as well as electricity imports. In 2015, the country produced 5 251 GWh of electricity and imported another 2 656 GWh to cover its consumption¹¹³.

In 2014, thermal plants were fired mainly on lignite (93 per cent of the thermal input) with heavy fuel oil accounting for just under four per cent and natural gas just over three per cent.¹¹⁴

The installed lignite capacity is 800 MW at two power plants and four units at Bitola and Oslomej. There is also a 210 MW heavy fuel oil power plant at Negotino, which is no longer in normal operational but held in reserve. In the past, there have been plans to build a 300 MW coal plant on this site, but the project is not proceeding, and it is no longer mentioned in the country's Energy Strategy until 2035.

The lignite in Macedonia is extracted in Kicevo and Pelagonija Basins with the determined coal deposits: Suvodol, Brod-Gneotino, Zivojno, Oslomej, Popovjani and Stragomiste which are open in two large surface coal mines: Oslomej (supplying TPP Oslomej) and Suvodol opencast mines (supplying TPP Bitola).

Reviews of existing studies about the availability of lignite on the eastern fringe of the Pelagonia basin, which hosts the three Bitola power plant units, lead to the overall conclusion that even if two new lignite mines were to be opened in the region, Macedonia would still need to start importing coal from 2025 onwards. Imports would contribute to more than half of the country's total electricity production beyond 2030. It is also important to note that the two new mines would involve underground operations, with which the country has no experience

to date. Also, an increase in the price of such locally-sourced lignite is anticipated due to the higher cost of 'coal production in the new mines and transport with longer distances/ on rough terrain'¹¹⁵

Suvodol mine

This employed 1514 people in 2014, which produced an overall six million tonnes of lignite, according to the company's website¹¹⁶, resulting in a productivity per person of 3963 tonnes of lignite.

From the overall determined 664 million tonnes geological coal reserves in Macedonia, it is estimated that 38 per cent could be exploited with opencast excavation, and the rest with underground technology. ELEM, the state-owned utility which operates both the lignite power plants and the lignite mines, has plans and already secured a EUR 64.5 million loan from Deutsche Bank¹¹⁷ to develop an underground mine at Suvodol – a 'deep underlying coal seam' - with a planned annual capacity of 6.5 million tonnes¹¹⁸. There is no information available with regards to the number of jobs this mine expansion would bring, nor for what period of time, but the fact remains that Macedonia has no experience in underground mining, which may mean the jobs in this planned mine would be outsourced.

Bitola power plant

Bitola has an installed capacity of 675 MW at three units that were commissioned in 1982, 1984 and 1988, respectively, and consumes about 2 million tonnes of coal annually¹¹⁹. The Bitola power plant has undergone a major modernisation in recent years. This plant, combined with the 125 MW Oslomej lignite plant, covers 80 per cent of the domestic electricity consumption.

Bitola 1-3 has produced 3982 GWh (on average

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114
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for the 2008-2013 period) while employing 2597 people at the end of 2015¹²⁰. However it is not clear whether this figure also includes the mine. If not, this places the power plant at the bottom of the productivity regional ranking, with only 1533 GWh/worker produced for 2008-2013.

The first unit of the Bitola power plant is expected to be shut down by 2024, while no official date has been set for the remaining two. However, under obligations of the Energy Community Treaty, all power plants need to be compliant with the Industrial Emissions Directive strict emission limit values for existing plants by 2028, so further rehabilitation must be carried out.

Oslomej power plant

Oslomej entered operation in 1980 with an installed capacity of 125 MW and currently generates 525 GWh annually (averaged for the period 2008-2013¹²¹). It is supplied with coal from the Oslomej open cast mine that has an annual production of 1 200 000 tonnes of coal and an exploitation lifetime of 22 years from when it started in 1980 (it has not been running continuously).

This deposit is divided into two areas by the Temnica river, including:

- SM Oslomej – East, where the coal is entirely extracted; and
- SM Oslomej – West is in the final exploitation phase.

There is no available data on employment for the power plant, but the Oslomej complex (both the mine and power plant) has 750 employees, according to an answer to an official request for public information by the Macedonian NGO Analytica in June 2015. However, the company's website states that the number of employees at REK Oslomej was 974 in 2015, so this is the number used in the calculations below.

Oslomej is expected to go offline in 2017 and undergo a 'revitalisation' process in order to be put back online in 2021, according to the Macedonian Energy Strategy by 2035, which would extend the plant's life by 30 years¹²². There is no indication, however, as to how this process would be reflected in terms of job availability, or what the projected number of employees would be once the power plant would go back in operation.

The total electricity produced from the lignite units stood at 3 130 GWh in 2015¹²³, and the employment number according to the power plant operator ELEM was 3 694¹²⁴. But since the employment numbers for the mine and the power plant are aggregated, it is difficult to calculate the productivity per employee. If the number was indeed referring to power plant employees only, the productivity figure would be at an all time low for the region, at 0.85 GWh/ employee.

A study conducted by Eko-Svest in Macedonia concludes that there is over-employment in the biggest Macedonian thermal power plant, REK Bitola, and that by closing REK Bitola and opening one other smaller thermal power plant (TEC Mariovo), the number of employees in the coal sector will decline (from 3300 persons in 2015 to around 1000 in 2035/2040)¹²⁵.

Mariovo power plant - potential

Plans to build a new 300 MW thermal power plant have been around for at least five years. It would be fueled by coal deposits from the Mariovo basin. According to ELEM, the Mariovo power station "will be realized during 2013 to 2016," and "construction of the thermal power plant is planned to be in the same time as the opening of the mine¹²⁶." The Mariovo basin contains an estimated 70 million tonnes of underground coal reserves. The construction of the power plant was discussed in the feasibility study prepared for ELEM in 2013¹²⁷.

A public hearing was held on 21 January 2014 as part of the EIA. Extensive comments were given by civil society organizations, but after the hearing the study was neither approved, nor rejected, resulting in no further developments in the process.

In the draft version of the new energy strategy for Macedonia, discussed in early 2015, the opening of the power plant is postponed until 2033.

The EIA report states that the mine will operate in three shifts with approximately 500 employees, but there is no data available on projected annual generation. However, considering that the Šoštanj power plant in Slovenia has 200 employees for 600 MW i.e. double that foreseen in Mariovo, this number seems highly unlikely and another case of empty promises from governments in the region.

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MONTENEGRO

Pljevlja 1 – existing plant, 220 MW

The number of workers at the existing Pljevlja power plant has steadily decreased in recent years, from 333 in 2010 to 195 in 2015.¹²⁸ Pljevlja I generated 1411 GWh in 2015,¹²⁹ making 7.2 GWh per employee, while Belchatow in Poland generates 10.4 GWh annually per person and Šoštanj 6 generates 17.5 GWh per person. If Pljevlja's output per employee were to equal to Belchatow's it would only need 135 employees, or if it was equal to Šoštanj 6 in Slovenia, there would only be 80. Even with the decrease in the number of employees in recent years, Pljevlja I was in July 2016 reported as bordering on unfeasible due to the current low market price of electricity.¹³⁰

As the plant is not in compliance with the Large Combustion Plants Directive, it will need to decrease its working hours from 1 January 2018 and will be able to run for a maximum 20 000 hours until the end of 2023. Therefore further staff cuts can be expected.

Pljevlja II - planned, 254 MW

The main two justifications for the

construction of Pljevlja II are that pollution in Pljevlja will decrease and that much-needed jobs will be created in the town. Both are false.

The Pljevlja II project does not include the construction of a district heating system, so smoke from individual stoves will persist. Nor will pollution from the plant be carried out of the Pljevlja valley, as it is planned for the pollution to be emitted from the cooling tower, not the existing 250 metre chimney.

Jobs are likely to further decrease rather than increase. The feasibility study for the new plant estimates that 147 workers will be employed.¹³¹ Generation will be around 1700 GWh annually.¹³² This would make 11.5 GWh per worker, much less than Šoštanj 6 in Slovenia at 17.5 GWh per worker, in a situation where Šoštanj 6 has huge financial problems. This may lead to a further decrease in the number of workers at Pljevlja. In order to achieve the same output per employee as Šoštanj 6, only 97 employees would be needed at the new plant.

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132
www.gov.me/ResourceManager/Download.aspx?rId=244860&rType=2,p.57



CEE Bankwatch Network

Year	2010	2011	2012	2013	2014	2015	2016
Number of workers	1200	1076	1062	1013	921	935	872
Annual production in tonnes	1 937 855 (of which 1 833 311 sold to Pljevlja I)	2 063 170 (of which 1 882 184 sold to Pljevlja I)	1 785 014 (of which 1 703 254 sold to Pljevlja I)	1 692 542 (of which 1 646 655 sold to Pljevlja I)	1 655 037 (of which 1 604 529 sold to Pljevlja I)	Data not found	1 710 000 planned (of which 1 600 000 for Pljevlja I)
Tonnes per year per worker	1614.8	1917.4	1680	1670.8	1797	–	1961

Sources: http://www.rupv.me/sites/rupv.me/files/2013_-_izvjestaj_nezavisnog_revizora_rudnik_uglja_ad_pljevlja.pdf, <http://www.scmn.me/fajlovi/RUPV201112R.pdf>, <http://www.scmn.me/fajlovi/RUPV201512.pdf>, <http://www.scmn.me/fajlovi/RUPV201606.pdf>, <http://www.scmn.me/fajlovi/RUPV201412.pdf>, <http://www.gov.me/ResourceManager/FileDownload.aspx?rId=223118&rType=2>,

Existing mines to be expanded (Potrlica and potentially others at Mataruge and Otišovići)

The existing number of workers and production in the last few years is shown in the table below. The number of mineworkers has decreased.

One of several factors that will affect whether a new coal plant could be feasible is the price of coal. In order to reduce coal production costs to a feasible level, Fichtner, Deloitte and Poyry have calculated that the number of employees in the mine would need to be reduced to 544 or 520, depending on the scenario, by around 2025.¹³³ This may be possible, based on reductions in recent years, but it certainly

means that promises of additional employment are not realistic.

The number of people needed for the mine and unit 2 of Pljevlja should be compared with the number of people that would be needed for rehabilitation and landscape restoration if Pljevlja II is not built. Unfortunately no figures are available for this, but it is possible that for at least the first few years, a large proportion of the employees from the mine could continue to be employed in rehabilitation work, considering the scale of the mine, ash dump and spoil heap and their impact on Pljevlja.

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www.gov.me/ResourceManager/FileDownload.aspx?rId=244860&rType=2,
 p.43

ROMANIA

Romania has a balanced energy mix, one of the most diversified in the region, generating 61 670 GWh of electricity in 2015, of which came 14 467 GWh from lignite and 1 740 GWh from hard coal. Renewables production

was at 9 497 GWh and hydro electricity at 16 545 GWh. This mix makes Romania sufficiently independent and places the country among the top electricity exporters of the region.

THE DECLINE OF HARD COAL

Coal mining was once a thriving industry in Romania, employing almost a quarter of a million people directly, including at both underground and open cast mines and enabling some other 700 000 indirect jobs¹³⁴.

The industry has been hardest hit by a programme launched in 1997 with World Bank funds¹³⁵ aimed at closing unprofitable hard coal mines.

By 2000, the population of the Jiu Valley – Romanian's main hard coal mining region – was estimated at 160-170 000 inhabitants, largely concentrated in the region's six mining towns: Petroșani, Lupeni, Vulcan, Uricani, Petrila, and Aninoasa, and also including small villages such as Câmpul lui Neag and Lonea. In the late 1990s, eighty per cent of the workforce still depended on the mines for work and income, and by 2015 this number was still high, although the economic demographics of the region have undergone significant changes in recent years.

Through mine closures, forced layoffs and voluntary severance, the number of actual miners in the Jiu Valley has decreased considerably. The mine closures were accompanied by large lay-offs of miners. It is estimated that in 1989 there were some 50 000 mine workers (including both actual underground miners and auxiliary workers). The number of mineworkers in the Jiu Valley in 2000 was estimated to be between 18 000-20 000, decreasing to 4700 today. The impact of unemployment has been considerable, and with eleven of the original fifteen mines closed by 2015, social disruptions are only going to increase. There have been no long-term social programmes, though laid-off miners and their families no longer rise up in rebellion as they used to in the early 1990s when the fear of losing their jobs was first felt. Some have left to find work abroad, some waste away in decaying ghettos, and almost none have found new work in the area, which remains mono-industrial, with no opportunities for other types of businesses to emerge.

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http://www.puterea.ro/evenimente_puterea/conferintele-puterea-modernizarea-sectorului-de-carbune-necesita-investitii-de-2-miliarde-de-euro-84778.html

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<http://documents.worldbank.org/curated/en/791121468295193557/Romania-Mine-Closure-and-Social-Mitigation-Project>

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The measure endorsed by the Government is in accordance with the Council Decision 2010/787/EU of 10 December 2010 on state aid to facilitate the closure of uncompetitive coal mines and the European Commission decision C(2012) 1020 final, through which the European Commission has authorized Romania to grant from public funds a state aid worth 1.169 billion lei (approximately 270 million euros) to close the uncompetitive coal mines (...) from 2011 to 2018,

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<http://energie.gov.ro/wp-content/uploads/2016/08/ACTIVITATEA-MINIERA-2016-2030-22072016.pdf> table page 17

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draft Energy Strategy 2015-2035 - <http://energie.gov.ro/files/download/ca40a9f65974c0b>

In 1990 there were 15 active mines in the Jiu Valley, but by 2016:

- Eight mining units closed between 1994-2015: Câmpul lui Neag, Valea de Brazi, Bărbăteni, Aninoasa, Iscroni, Dâlja, Petrila Sud, and Lonea Pilier.
- Three mining units considered to be unprofitable (Uricani, Paroseni, Petrila) are operating within the Jiu Valley National Society for Mine Closure and are to be closed by 2018, receiving state aid for this;¹³⁶ and
- Four mining units considered to be profitable (Lupeni, Vulcan, Livezeni, Lonea) are operating within the Hunedoara Energy Complex (CEH). Some 4700 workers are employed in these mines

The Hunedoara Energy Complex (CEH), which operates two thermal power plants – Paroşeni and Mintia – and the remaining four hard coal mines, registered losses of some RON 404 million (EUR 90 million) in 2015 and was declared insolvent in 2016¹³⁷. The company produces five per cent of Romania's electric power and employs 6 300 people (4 700 in the mines and 1 600 in the power plants). Economists say there is no option except to cut costs and reduce the number of jobs. "Romania can no longer afford to pay millions of euro every year to preserve an industry that is not modernised and efficient," according to economic analyst Ilie Serbanescu.¹³⁸

According to European Council Decision

2012/1020 final and EC 2015/8066 final, all underground activity should stop by December 2017, and works towards ecological reconstruction and environmental monitoring should be finalised by 2019. In spite of this, the Romanian Government is negotiating with the Commission to allow state aid for closure of the Lonea and Lupeni underground mines on the one hand, and for keeping two power plant units (Mintia 3 and Paroşeni 4) in operation, on the other, making it even clearer that this sector can only be artificially kept alive.

If one lesson is to be learnt from this, it is that mine closures and the phasing out of a once secure and well-paid sector needs thorough planning and a diversification strategy well in advance.

Existing lignite mines

The Oltenia Energy Complex is today the third largest Romanian company in terms of employees – 15 268¹³⁹ as of 31 December 2015 – surpassed only by other state giants, the National Post and the Romanian Railways. Having dropped from 45 000 employees in 1994, however, the company is in further decline. In 2015 alone, OEC recorded a loss of EUR 200 million.

The complex was established in 2012 through the merger of Oltenia National Lignite Company and three large energy complexes: Rovinari, Turceni and Craiova. 15 open-pit mines and four power plants are managed today by the

Name of lignite mine	2013 Total number of employees	2014 Total number of employees	2015 Total number of employees
UMC Rovinari	548	562	504
Tismana I + II	742	782	791
Pinoasa	572	607	613
USM Rovinari	695	700	590
Roşia	1313	1258	1205
Peşteana	1146	1130	1008
Seciuri	1281	1168	339
Lupoia	1038	1032	954
Roşiuta	1235	1226	1177
Husnicioara	661	660	616
Jilt Sud	1784	1421	1228
Jilt Nord	1045	982	896
UMC Motru	311	299	167
<i>Executive jobs for the whole mining division</i>	218	149	130
Total	12 589	11 976	10 218

company. Its shareholders are the Romanian state through the Energy Ministry (77.15 per cent), the “Fondul Proprietatea” investment fund (21.56 per cent), Electrocentrale Grup SA (0.84 per cent) and Mine Closure and Conservation (0.44 per cent). Mining activities started in 1957, while the power plants were built between 1964 and 1987.

The mining activity of the Oltenia Energy Complex employs 10 218 miners in 15 pits as of December 2015 and produced 22.4 million tonnes of coal in 2015, marking a stark decline by 7.2 million tonnes compared to 2012 when the company was established¹⁴⁰ and an even more dramatic fall from the 34 million tonnes of lignite produced in 2008¹⁴¹.

The productivity figure for lignite stands at 2 220 tonnes/ worker in 2015, a substantial increase from 1 778 tonnes/worker in 2013, but nowhere near the productivity levels of other EU Members States like Poland or the Czech Republic, that Romania likes to compare itself with.

The production cost per tonne of lignite has also followed the downward trend, dropping from RON 61.53 /tonne (approximately EUR 14.3 in 2012 to RON 52.65 /tonne (EUR 11.8 /tonne). During the adoption of the 2016-2030 National Energy Strategy, the lignite working group’s report points out that half of the production cost for one tonne of lignite is represented by personnel costs¹⁴², and 15 per cent by energy consumption.

However in the framework of the sector’s restructuring by 2030, the report only speaks of measures such as reducing mining equipment by 30 per cent and energy savings in the mines’ own operation by 47 per cent until 2030. Not one word is given about further job cuts, which are inherently more efficient than reducing equipment is, and whose costs make up the highest proportion in the overall lignite price.

As of 2016, the complex has so far laid off 802 employees¹⁴³, although the restructuring plan speaks of 2 000 job cuts in 2016, followed by other 3 000 between 2017 and 2020¹⁴⁴.

Three lignite mines are expected to close in the near future:

- Husnicioara by the end of 2016, being the ‘captive’ supplier of an only beneficiary power plant (Halânga) which has been declared bankrupt earlier in 2016. So the total number of lignite miners will be reduced by 661.
- Rovinari starting in 2019, when its coal is expected to run out. This pit currently employs 1234 miners.
- Peşteana quarry - employing 1146 - is also expected to stop operation in 2023 for the same reason.

Lignite production is expected to follow

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<http://energie.gov.ro/wp-content/uploads/2016/08/ACTIVITATEAMINIERA-2016-2030-22072016.pdf>
 page 20, fig. 9

143
http://ceoltenia.ro/lista-nominala-personalului-afectat-de-planul-de-disponibilizare/?parent_page=142

144
<http://www.zf.ro/companii/energie/dezastru-doua-mii-de-concedieri-la-complexul-energetic-oltenia-in-2016-15276068>

electricity production's downward trend by 2020, from 23 million tonnes/year to 19.7 million tonnes/year, but the Energy Strategy lignite working group's document speaks of an increase by 4.5 million tonnes/year from 2021, when a new 600 MW unit is expected to enter operation.

In spite of all evidence pointing at a decline in both electricity consumption and consequently production, as well as in available coal reserves, the Oltenia Energy Complex is pressuring the Romanian Government to issue governmental decisions to expropriate land and homes sitting at the edges of the mines to expand them. In December one such decision was issued for the Jilt Nord mine, causing protests, lawsuits and an intervention by the Romanian Ombudsman over the procedural adoption of the act as well as over the ridiculous price of 1 EUR/m² offered

to owners, regardless of what was on the seized lands¹⁴⁵.

Five more such decisions are listed in the above-mentioned working group's report: for Jilt Sud and the Roşia pits by the end of 2016, for Pinoasa and Tismana by June 2017 and for Roşiuta by the end of 2017.

All these pits have recently been granted environmental permits for expansion, following three years of court battles and an infringement procedure, because the Complex had previously only applied for deforestation permit, not for mine expansion. Even with the new permitting process, the EIA Directive provisions have not been adhered to in terms of public participation and access to documentation and are being challenged in court for suspension by Bankwatch Romania.

EXISTING LIGNITE MINES

145
See more: <http://stories.bankwatch.org/a-village-disappearing>

146
<http://ceoltenia.ro/job-uri/locurile-noastre-de-munca/>

147
<http://ceoltenia.ro/despre/domenii-de-activitate/producerea-de-energie/>

148
http://www.greenpeace.org/romania/Global/romania/energie/publicatii/starea_termocentralelor_pe_carbune_din%20Romania_in_2016.pdf

In December 2015, Oltenia Energy Complex had 4 603¹⁴⁶ employees to an installed capacity of 4 980 MW (1320 MW Rovinari, 2310 MW Turceni, 630 MW Işalnita, 300 MW Craiova, 420 MW Brăila) and 14 467 GWh production in 2015. This brings the figure to 3.14 GWh per worker.

However since 31 December 2015, four units (Brăila 1 and 2 and Turceni 1 and 7) have been shut down as they have run out of the 20 000 operating hours under the Large Combustion Plant Directive opt-out derogation, leaving the Oltenia Energy Complex with 3 900 MW operational.

The **Işalnita** thermal power plant has an installed capacity of 630 MW (two 315 MW units) and is the oldest lignite power plant in the country, having entered operation in 1964 and 1968, respectively. Since then, the plant has delivered 203 TWh of electricity and currently employs 756 people. It underwent refurbishment works, with both units equipped with de-SO_x and dense slurry installations for ash and wastewater removal¹⁴⁷. According to an analysis of the coal power plants' operating compliance, Işalnita's units are two of the very few (ten of 31) functioning in full compliance with current legislation¹⁴⁸.



Mihai Stoica

Rovinari thermal power plant, built between 1972 and 1978 with six units, has a functional installed capacity of 1320 MW. Currently only 3 are operational, while the fourth is undergoing rehabilitation for SOx emission-level compliance. Since the first unit was commissioned in 1972, Rovinari has produced 182 TWh of electricity and currently employs 1480 people. Two of the plant's units (5 and 6) benefit from NOx emission level compliance derogation until 31 December 2017, under Romania's EU accession treaty, while units 3 and 4 have a NOx derogation until June 2020 according to the Transitional National Plan under the Industrial Emissions Directive.

Turceni thermal power plant was put in operation between 1978 and 1987 with seven 330 MW units. Like Rovinari however, it has only 1 320 MW of compliant installed capacity from four units. Two units (1 and 7) have been opted-out under the Large Combustion Plant Directive's 20 000 operating hours derogation in 2015, while unit 6 has not recorded any electricity production since 2012, due to severe technical failures. Unit 3 is expected to go offline in 2029 and no other date for closure has been mentioned for the remaining units. The

plant employs 1 571 people currently, an abrupt fall from the 4 500 employees in early 2012.¹⁴⁹ Turceni is the subject of a series of legal actions on the national and European levels, as well as to the European Bank for Reconstruction and Development compliance mechanism for failing to obtain environmental permits for Units 6¹⁵⁰ and 7.¹⁵¹

Craiova II is the newest lignite power plant, commissioned in 1987, with an installed capacity of 300 MW in two units that supply both electricity to the national grid and heating to the city of Craiova. The plant employs 672 workers. Both units have undergone rehabilitation in 2015 and have been equipped with de-SOx installations. However the plant has been operating illegally since 2010, without an integrated environmental authorisation, though this has not resulted in any sanctions from the environmental inspectorate. Only in 2016 has a request for such a permit been submitted.

Oltenia Energy Complex's output is expected to drop from 14 TWh in 2016 to 13.4 by 2030, but this figure counts the construction of a new unit at Rovinari, which seems less and less likely.

149 http://adevarul.ro/locale/targu-jiu/230-salariati-complexurile-energetice-turceni-rovinari-vor-disponibilizati1_50ae98d97c42d5a6639e4ab3/index.html

150 <http://bankwatch.org/news-media/for-journalists/press-releases/ebd-suspends-loan-romanian-coal-plant-turceni>

151 <http://www.greenpeace.org/romania/ro/campanii/schimbari-climatice-energie/carbunele-energia-trecutului/gnm-suspenda-activitatea-gup-7-Turceni/>



Rovinari 600 MW project – planned

Plans to build a new unit at the existing Rovinari power plant have been around for more than five years and seemed to gain speed in 2013 when the Romanian and Chinese governments signed a memorandum of understanding listing this as one planned investment. China Huadian Engineering (CHE) is set to build the 600 MW unit, with Chinese banks securing finance. CHE would be the general contractor, but Romanian companies would do the actual construction work. Since then, there have been numerous trips by Romanian officials to China and several Chinese delegations visiting the project site. A pre-feasibility study has been reportedly finalised but was never made public, and the Huadian-Oltenia joint venture was established in 2015.

The job numbers that have been thrown in the public sphere range from 4000 for the 'implementation phase' (not specified whether Romanian or Chinese or both), 3000 jobs maintained during the project lifetime and 1800 new jobs created in the mining sector. The Romanian government¹⁵² estimated 500 jobs,

which is more down to earth according to OEC's former director.¹⁵³

No environmental impact assessment has been conducted and the project seems at a stand-still. The memorandum estimates the project costs at EUR 847 639 million, with a 30 year lifespan and an expected date of operation in 2019. The lignite would come from three nearby open pits: Roşia, Tismania and Pinoasa. All three are listed by the lignite working group within the National Energy Strategy 2016-2030 as needing governmental decisions for expropriation due to expansion and state budget allocations for this process.

Although no clear figure has been put forward with regards to planned generation of this new unit, the agreement for setting up the Huadian-Oltenia Company estimates a total of 6 750 operating hours/year, with 41.72 per cent technical efficiency, which would result in 4 050 GWh/year. If we take into account the 500 jobs figure, it would translate to 8.1 GWh/worker, which is not even half that of Šoštanj 6 in Slovenia, making even this 500 figure very incredible.

152
<http://gov.ro/ro/stiri/masuri-pentru-realizarea-unei-investitii-importante-la-sucursala-electrocentrale-rovinari>

153
<http://www.puterea.ro/economie/chinezii-de-la-huadian-vin-la-rovinari-pentru-discutii-despre-grupul-de-500-mw-88911.html>

SERBIA

Electricity production in Serbia includes over 70 per cent from coal, while the remaining 30 per cent is produced by large hydropower plants.

Serbia has a large amount of coal reserves, with 4 billion tonnes of proven lignite deposits. The reserves are located in two main coal basins, Kolubara and Kostolac. The coal mines in Serbia are owned and managed by subsidiaries of state-owned EPS.

The Kolubara Mining Basin provides around 75 per cent of the lignite used for EPS' thermal generation. It produces over 30 million tonnes of lignite annually, which is supplied to the Nikola Tesla and Morava power plants, together producing more than half of Serbia's electricity.

25 percent of lignite is produced in the Kostolac basin¹⁵⁴ and supplies the Kostolac A and B thermal power plants.

Year	Drmno (tonnes of lignite mined)	Drmno number of mine workers	Drmno productivity (tonnes lignite/worker)	Kolubara (tonnes of lignite mined)	Kolubara number of mine workers	Kolubara productivity (tonnes lignite/worker)
2006	6,306,125	2258	2792.79	29,198,420	6480	4505.93
2007	6,691,964	2297	2913.35	29,275,954	6678	4383.94
2008	6,826,344	2195	3109.95	30,538,976	6776	4506.93
2009	8,339,474	2036	4096.01	29,141,916	6332	4602.32
2010	7,552,111	1970	3833.56	29,739,634	6190	4804.46
2011	9,229,774	1926	4792.20	31,060,625	6084	5105.30
2012	7,904,296	1904	4151.42	31,060,625	6084	5105.30
2013	8,803,759	1873	4700.35	30,709,715	5984	5131.97
2014	5,849,119	1877	3116.21	23,355,175	6881	3394.15
Total	79,182,838			318,823,980		

Source: Federalno Ministarstvo Energije, Rudarstva i Industrije: Informacija o stanju u elektroenergetskom sektoru Federacije BiH sa prijedlogom mjera, January 2016.

EXISTING LIGNITE MINES¹⁵⁵

Lignite production in Serbia seems to be the exception to the rule in the region, as it has not followed a clear downward trend. Production is quite level at around 38 million tonnes per year, with small variations from one year to the next. Catastrophic flooding in May 2014 hampered for several days the Veliki Crljeni and Tamnava-West Field open cast mines and partly Field D and Field B in the Kolubara mining basin. After the flood, coal production was completely stopped at Tamnava West, the hardest hit and which only re-opened for full production one year later.

It is noteworthy, however, that in spite of variations in the lignite produced, the number of workers at both the Kolubara and Kostolac mining basins was decreasing until 2014, when the number of employees suddenly jumped from 5 984 to 6 881, a 15 per cent increase. This is presumably because the pumping of water from the flooded mine required extra labour, which should be counted as an exception to the rule.

The productivity level measured in tonnes of lignite produced by worker per year is above

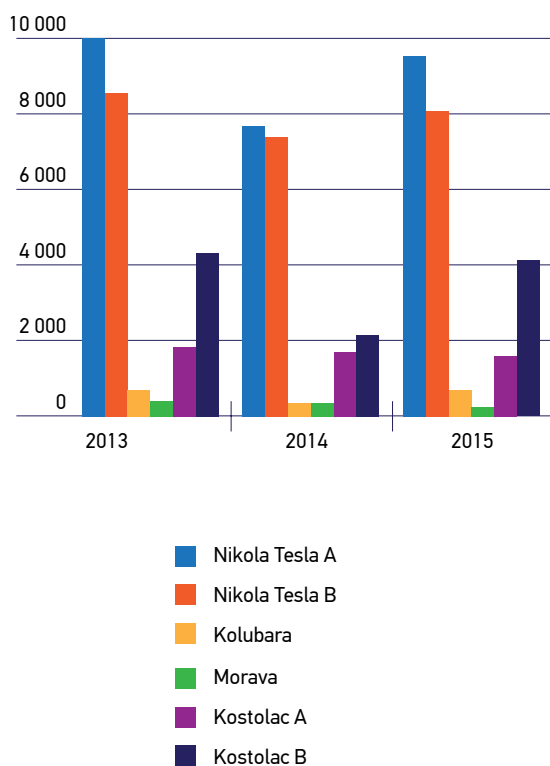
¹⁵⁴ <http://www.te-ko.rs/>

¹⁵⁵ Source: EPS answer to information requests from CEKOR, 09.12.2015 and 13.01.2016

the average for the region, and has noted an improvement over the last ten years. The Kolubara mining complex in particular has better productivity than the Drmno mine, standing at over 5 000 tonnes/worker between 2011-2013, while in the Kostolac basin it increased from 2 792.79 in 2006 to 4 700 in

2013, noting that in 2014 the level was much lower than in the previous year. This can be explained by the flooding of the mine in July and October 2014, but also by the fact that one unit at the Kostolac B power plant was taken offline for rehabilitation works, so less coal was needed.

EXISTING POWER PLANTS



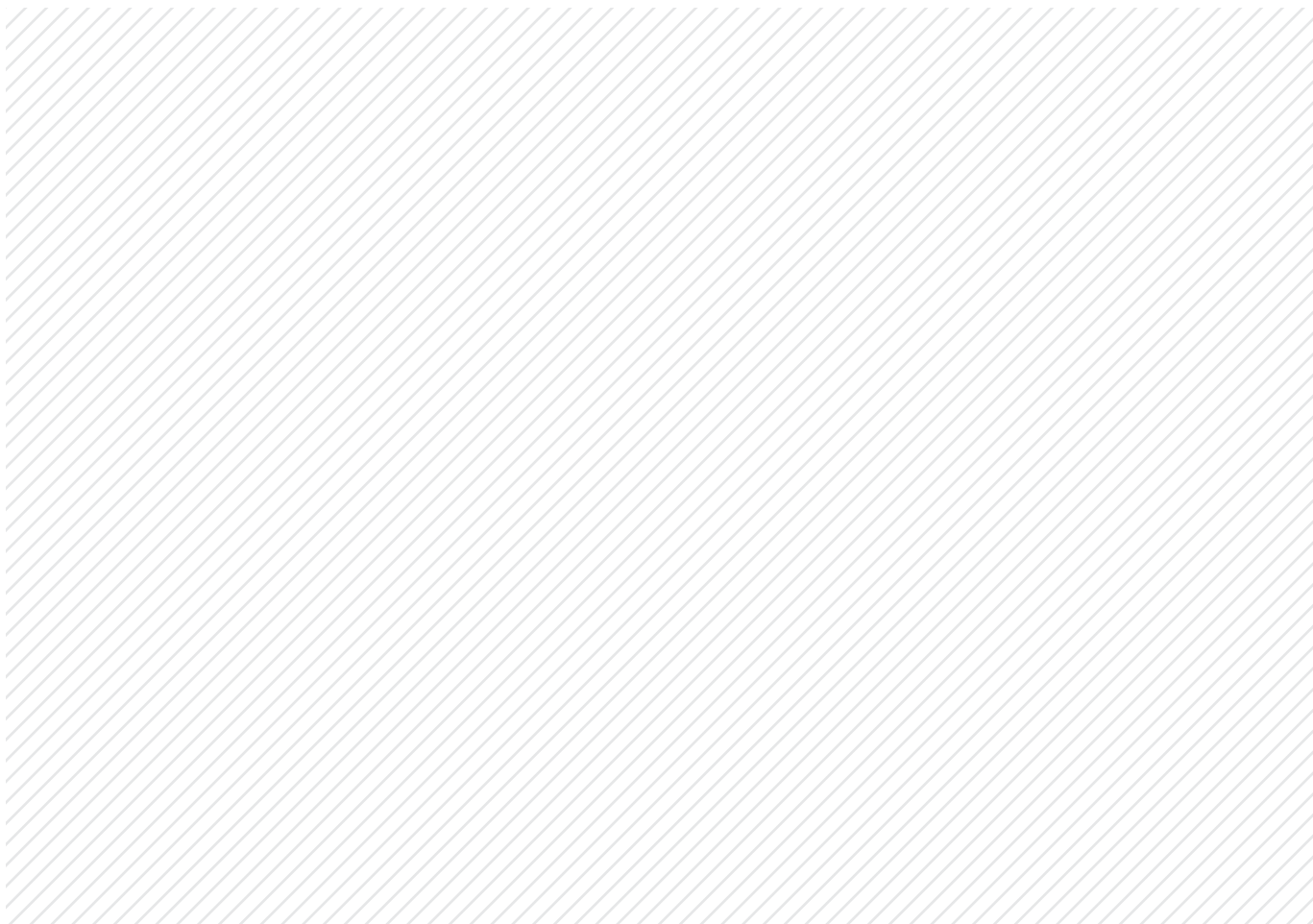
According to a 2015 EPS Technical Report¹⁵⁶, the total output capacity stands at 4 032 MW in six thermal power plants:

- 1597 MW in Nikola Tesla A, generating 9 693 GWh in 2015, 7 851 in 2014 and 10 120 in 2013
- 1190 MW in Nikola Tesla B, generating 8 196 GWh in 2015, 7 523 in 2014 and 8 658 in 2013
- 216 MW in Kolubara, generating 803 GWh in 2015, 459 in 2014 and 753 in 2013
- 108 MW in Morava, generating 336 GWh in 2015, 490 in 2014 and 533 in 2013
- 281 MW in Kostolac A, generating 1 743 GWh in 2015, 1 834 in 2014, and 1 983 in 2013
- 640 MW in Kostolac B, generating 4 246 GWh in 2015, 2 298 GWh in 2014 and 4 489 in 2013¹⁵⁷

There is no publicly available data on the breakdown of employees for each thermal power plant.

156
<http://www.eps.rs/Eng/Tehnicki%20Izvestaji/TEHNICKI%20GODISNJAK%20WEB%202015%20E.pdf>

157
 All figures from EPS' annual technical report <http://www.eps.rs/Eng/FolderDocs.aspx?list=Tehnicki%20Izvestaji>



Kostolac B3 350 MW unit - planned

In November 2013 a deal was signed with China's National Machinery and Equipment Import and Export Corp (CMEC) to construct the new Kostolac B3 lignite plant in northeast Serbia. No tender procedure has taken place and a contract for a USD 608 million loan was signed with China's ExIm Bank in December 2014.

The project's EIA approval, initially issued in December 2013, has since expired, and the project is currently in the process of obtaining a new one, which will include, among others, public consultations in Romania due to its potential transboundary environmental impacts.

To supply the new unit with lignite, the Drmno mine has to expand from 9 million tonnes/year to 12 million, but the expansion does not yet have an EIA study or environmental permit, so there is no information with regards

to expected employment numbers. According to a Decision from 2013 by the Ministry of Environment¹⁵⁸, no such EIA is planned to even be conducted, leaving this project in a haze of mystery and speculation on all sides.

When it comes to the number of jobs that would be created for this new unit, no official information can be found in either the investment plan from 2015, or the feasibility study of 2013. Media reports speak about 600 jobs in the construction phase¹⁵⁹, most likely to be equally divided between Chinese and Serbian workers, as in the case of Stanari in BIH.

The anticipated electricity generation per year is at 2 765 GWh, almost double that estimated at the Banovici power plant (1 706 GWh) for the same installed capacity. Yet it will be indeed the number of employees that would tip the scale towards higher productivity or political jobs.

158 http://mmediu.ro/app/webroot/uploads/files/2016-08-01_raspunsuri_chestionar_EIA.pdf

159 <http://www.novosti.rs/vesti/naslovna/ekonomija/aktuelno.239.html:540369-Goran-Horvat-Novi-blok-Kostolca-otvara-600-radnih-mesta>



Overview of mine productivity per employee (country average and mine-by-mine)

Country	Year	Number of employees	Lignite production in tonnes	Lignite production per employee in tonnes per year	Source
Bosnia and Herzegovina (EPBIH)	2014	9145	4 710 000	515	http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/El_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf
Bosnia and Herzegovina (Banovići)	2016/2015	2798	1 328 169	474	http://rmub.ba/onama.html
Bosnia and Herzegovina (Federation average)	2014-2016	11943	6 038169	505	ibid
Bosnia and Herzegovina - Republika Srpska (Gacko only)	2013	689 (939)	2 480 622	3600 (2641)	http://www.ritegacko-rs.ba/en/o-nama/ljudski-resursi/ http://www.ers.ba/images/stories/izvjestaji/mh2014osn.pdf
Czech Republic	2012	9 093	43 500 000	4784	http://euracoal.eu/info/country-profiles/czech-republic/
Germany	2012	16 622	185 400 000	11 154	http://euracoal.eu/info/country-profiles/germany/
Greece	2014	3417	48 000 000	14 047	https://www.dei.gr/Documents2/ANNUAL%20REPORT/AR-2015/Annual_Report_2015_EN_WEB.pdf PPC 2015 Annual Report, page 10
Kosovo (Sibovc)	2016/2015	3249	8 200 000	2524	Information request to KEK, Sept. 2016, Auditors' Report for the year ended 31 December 2015. http://kek-energy.com/kek/en/financial-audit-reports/
Macedonia (Suvodol only)	2014	1514	6 000 000	6963	http://elem.com.mk/index.php?option=com_content&view=article&id=121&Itemid=151&lang=mk
Montenegro (Pljevlja)	2014	921	1 655 037	1797	http://www.scmn.me/fajlovi/RUPV201412R.pdf
Poland	2013	13 598	-	4 800	http://www.ppw.org.pl/wb/86/7.php
Romania	2015	10 218	22 400 000	2192	Redundancy plan - Annex 6 to the Decision of the General Assembly of shareholders of Oltenia Energy Complex on 11.07.2016
Serbia (Drmno and Kolubara only)	2013	7857	39 513 474	5029	Source: EPS responses to information requests by CEKOR
Slovenia (Velenje only)	2013	1333	3 721 188	2792	http://www.rlv.si/si/files/default/Letna%20porocila/LETNO%20POROCILO%202013.pdf

Mine	Year	Number of employees	Lignite production in tonnes	Lignite production per employee in tonnes per year	Source
Stanari, RS, BIH	2014/2013	566	881 632	1557	http://www.eft-group.net/index.php/news/single/70/EFT-Stanari-Receive-Best-Greenfield-Investment-Award-for-2013 , http://www.eft-stanari.net/sr/stanari-mine-results.html
Ugljevik, RS, BIH	2014	No data found	1 750 170	No data found	http://www.ers.ba/images/stories/izvjestaji/mh2014osn.pdf
Gacko, RS, BIH	2013	689 (939)	2 480 622	3600 (2641)	http://www.ritegacko-rs.ba/en/o-nama/ljudski-resursi/ http://www.ers.ba/images/stories/izvjestaji/mh2014osn.pdf
Kreka, FBH	2014	3010	1871000	622	http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/El_materijali_2016/INFORMACIJA%20za%20parlament%20el.sektora_bos.pdf
Đurdevik, FBH	2014	945	466000	493	
Kakanj, FBH	2014	1906	1100000	577	
Zenica, FBH	2014	1469	292000	199	
Breza, FBH	2014	1262	456000	361	
Bila, FBH	2014	354	177000	500	
Gračanica, FBH	2014	199	349000	1754	
Banovići, FBH	2016/2015	2798	1 328 169	474	
Vattenfall Lusatia operations, DE	2014/2013	8200	63 600 000	7756	http://corporate.vattenfall.com/press-and-media/news/2014/lignite-in-numbers/
Sibovc, KOS	2016/2015	3249	8 200 000	2524	Information request to KEK, Sept. 2016, Auditors' Report for the year ended 31 December 2015. http://kek-energy.com/kek/en/financial-audit-reports/
Suvodol, MK	2014	1514	6 000 000	3963	http://elem.com.mk/index.php?option=com_content&view=article&id=121&Itemid=151&lang=mk
Pljevlja, ME	2014	921	1 655 037	1797	http://www.scmn.me/fajlovi/RUPV201412R.pdf
Roşia, RO	2015	1205	3 617 000	3001	Redundancy plan - Annex 6 to the Decision of the General Assembly of shareholders of Oltenia Energy Complex on 11.07.2016
Peşteana, RO	2015	1008	2 016 000	2000	
UMC Rovinari, RO	2015	504	1 119 000	2220	
Tismana, RO	2015	791	2 665 000	3369	
Pinoasa, RO	2015	613	1 500 000	2447	
Roşiuța, RO	2015	1177	3 348 000	2884	
Lupoia, RO	2015	945	2 340 000	2476	
Husnicioara, RO	2015	616	1 098 000	1782	
Jilt Sud, RO	2015	1228	2 301 000	1874	
Jilt Nord, RO	2015	896	2 185 000	2439	
Drmno, SRB	2013	1873	8 803 759	4700.35	EPS answer to information request by CEKOR, 13.01.2016
Kolubara mining complex, SRB	2013	5984	30 709 715	5131.97	EPS answer to information request by CEKOR, 09.12.2015
Velenje (Šoštanj), SLO	2013	1333	3 721 188	2792	http://www.rlv.si/si/files/default/Letna%20porocila/LETNO%20POROCILO%202013.pdf

Overview of productivity per employee in existing power plants

Country/ power plant	Year	Number of employees	Generation in GWh	GWh per employee	Source
Germany - country average existing units	2013	5700	161 000	28.2	http://corporate.vattenfall.com/press-and-media/news/2014/lignite-in-numbers/
Greece	2014	4756	22 708	4.77	Independent Power Transmission Operator: http://www.admie.gr/deltia-agoras/miniaia-deltia-energeias/ And https://www.dei.gr/Documents2/ANNUAL%20REPORT/AR-2015/Annual_Report_2015_EN_WEB.pdf PPC 2015 Annual Report, page 10
Šoštanj 6, SLO	Average	200	3 500	17.5	http://www.te-sostanj.si/nip5/index.html
Stanari, BIH	2016	No data available	2000	No data available	http://www.eft-group.net/index.php/investments/tpp-stanari
Ugljevik I, BIH	2014	No data available	1591	No data available	http://www.ers.ba/images/stories/izvjestaji/mh2014osn.pdf
Gacko, BIH	2013	411	1773	4.3	http://www.ritegacko-rs.ba/en/o-nama/ljudski-resursi/ , http://www.ritegacko-rs.ba/termoelektrana/ostvareni-rezultati-2/ ,
Tuzla units 3-6, BIH	2013/average	727	3100	4.2	http://www.elektroprivreda.ba/upload/documents/GI_bosanski_2014.pdf
Kakanj 5-7, BIH	2014	625	2300	3.68	http://www.elektroprivreda.ba/upload/documents/GI_bosanski_2014.pdf
Kosova A, KOS	2015	No data available	1905	No data available	http://mzhe-ks.net/repository/docs/HLFSOS_-_MED_presentation.ppt
Kosova B, KOS	2015	No data available	3556	No data available	http://mzhe-ks.net/repository/docs/HLFSOS_-_MED_presentation.ppt
Pļjevlja I, ME	2015	195	1411	7.2	http://www.mrt.gov.me/rubrike/javna_rasprava/148445/Javna-rasprava-o-Nacrtu-Detaljnog-prostornog-plana-za-Termoelektranu-Pļjevlja-i-Nacrtu-Izvjestaja-o-strateskoj-procjenitica.html , http://www.cdm.me/ekonomija/te-pljevlja-nakon-33-godine-rada-uspjesan-rezultat , http://www.epcg.com/o-nama/proizvodnja-i-elektroenergetski-bilans
Bitola 1-3, MK	Average 2008-2013	2597* <i>Includes mines and power plant</i>	3982	No data available	Strategy for development of the energy sector in Macedonia until 2035), 2015, Ministry of Economy http://www.economy.gov.mk/ministerstvo/sektori_vo_ministerstvo/sektor_za_ene_rgetika/4528.html
Oslomej	Average 2008-2013	750* <i>Includes mines and power plant</i>	525	No data available	Strategy for development of the energy sector in Macedonia until 2035), 2015, Ministry of Economy http://www.economy.gov.mk/ministerstvo/sektori_vo_ministerstvo/sektor_za_ene_rgetika/4528.html
Turceni 1-5, 7, RO	2015	1571	4940	3,14	Redundancy plan - Annex 6 to the Decision of the General Assembly of shareholders of Oltenia Energy Complex on 11.07.2016
Rovinari 2-6, RO	2015	1480	6130	4,14	
Craiova 1-2, RO	2015	1100	672	1,63	
Işalnita 1-2, RO	2015	2780	756	3,67	
Nikola Tesla A, SRB	2015	No data available	9693	No data available	http://www.eps.rs/Eng/FolderDocs.aspx?list=Tehnicki%20Izvestaji
Nikola Tesla B, SRB	2015	No data available	8196	No data available	http://www.eps.rs/Eng/FolderDocs.aspx?list=Tehnicki%20Izvestaji
Kolubara	2015	No data available	803	No data available	http://www.eps.rs/Eng/FolderDocs.aspx?list=Tehnicki%20Izvestaji
Morava	2015	No data available	336	No data available	http://www.eps.rs/Eng/FolderDocs.aspx?list=Tehnicki%20Izvestaji
Kostolac A	2015	No data available	1743	No data available	http://www.eps.rs/Eng/FolderDocs.aspx?list=Tehnicki%20Izvestaji
Kostolac B	2015	No data available	4246	No data available	http://www.eps.rs/Eng/FolderDocs.aspx?list=Tehnicki%20Izvestaji

Overview of productivity per employee in planned power plants

Planned power plant	Number of employees	Average planned generation in GWh	GWh per employee	Source
Ugljevik III, BIH	303	3371	11	http://www.nosbih.ba/files/dokumenti/Indikativan%20plan%20razvoja/2016/IPRP%202017-2026%20-%20Prijedlog.pdf
Gacko II, BIH	No data available	No data available	No data available	
Tuzla 7, BIH	No data available	2632	No data available	http://www.elektroprivreda.ba/upload/documents/materijali286MB.pdf
Banovići, BIH	200	2200	11	Rudarski institut d.d. Tuzla: IZMJENE I DOPUNE STUDIJE O UTICAJU NA OKOLIŠ ZA TE „BANOVIĆI“, Tuzla, May 2015, p. 31, http://www.nosbih.ba/files/dokumenti/Indikativan%20plan%20razvoja/2016/Juli%202016/IPRP%202017-2026%20-%20Final.pdf
Kakanj 8, BIH	No data available	1755	No data available	http://www.new.sarajebusinessforum.com/sites/default/files/2016-04/E-204%20PresentationTE%20Kakanj%20bl%208.pdf
Ptolemaida V, GR	250	4620	18.48	http://tdm.tee.gr/wp-content/uploads/2015/04/paremvasi-tee-tdm-anaforika-me-tin-kataskeyi-tis-monadas-ptolemaida-v.pdf
Meliti II, GR	No data available	Around 3500	No data available	http://www.wvf.gr/images/pdfs/Roadmap_PostLignite_EN.pdf , http://www.wvf.gr/images/pdfs/Lignite_Study_WWFGreece.pdf
Kosova e Re, KOS	500	3370	6.74	http://mzhe-ks.net/repository/docs/DSEKKS_VERSIONI_FINAL_3_GUSHT_2016_Anglisht.pdf , http://www.reuters.com/article/kosovo-energy-contourglobal-idUSL6N0VE2DW20150204
Pljevlja II, ME	147	1700	11.5	www.gov.me/ResourceManager/FileDownload.aspx?rId=244860&rType=2
Rovinari 7, RO	500	4050	8.1	http://www.puterea.ro/economie/chinezii-de-la-huadian-vin-la-rovinari-pentru-discutii-despre-grupul-de-500-mw-88911.html
Kostolac B3	600	2765	4.6	http://www.novosti.rs/vesti/naslovna/ekonomija/aktuelno.239.html:540369-Goran-Horvat-Novi-blok-Kostolca-otvara-600-radnih-mesta , Investment plan, revision December 2015

EMPLOYMENT IN RENEWABLES AND ENERGY EFFICIENCY

A country's energy sector should not be planned in terms of which energy source provides the most jobs. Nor does a coal-mining area's transformation away from coal need to be based around energy provision but can rather be based around other kinds of industry or service. Nevertheless, within the energy sector itself, it is important to highlight that coal is not the only possibility for employment. While renewable energies like wind and solar

require relatively little employment during the operational period, manufacturing and installing the equipment can provide significant employment. Few in the southeast European region have yet grasped this opportunity, but a factory manufacturing solar panels has recently opened in Kosovo, initially with 50 workplaces¹⁶⁰, and a company in northern Croatia started in 2009 with 40 employees and by 2015 had increased to 140.¹⁶¹

Overview of jobs in all renewable energy sectors in the EU, 2013

The adoption of the climate and energy package in 2009 on the EU level, with targets for both renewable energy production and energy efficiency, has been a real boost in the EU countries' economies, reflected in employment opportunities and energy production, even though the sector's development had begun already. This trend has translated in 2013 into:

- one of every fourth kWh consumed in the EU being from renewable energy sources
- 1 148 050 jobs in all types of renewable energy production facilities excluding large hydro; and
- a turnover of over EUR 130 billion¹⁶².

A source-by-source comparison at the EU level shows that solid biomass added 37 900 jobs in

2013, wind another 12 600, and geothermal 7 300 jobs in the EU, compared to the previous year. Interestingly, the biomass sector, at 342 100 jobs, now tops wind energy's 319 600 jobs. Both are far ahead of solar PV (165 000), geothermal heat and power (104 600) and biofuels (97 200). Biogas, small hydropower and solar thermal heat and power contribute smaller shares to overall employment.


With the entering into force of the Renewable Energy Directive in 2014 in the Energy Community countries¹⁶³ and a deadline to deliver on the set targets by 2020, it is fair to assume that the countries of the Western Balkans would experience a similar 'golden age' of renewable energy production if their governments shifted their energy policies towards this sector. The sources of renewable energy which employ the highest number of

160
<http://renewables.seenews.com/news/kosovo-opens-5-mln-euro-plant-for-solar-panels-527873>

161
http://www.fzoeu.hr/hr/novosti/proizvodnjom_solarnih_modula_utostrucili_broj_radnih_mjesta/

162
http://www.energies-renouvelables.org/observ-er/stat_baro/barobilan/barobilan14_EN.pdf, pages 138-139

163
https://www.energy-community.org/portal/page/portal/ENC_HOME/AREAS_OF_WORK/Obligations/Renewable_Energy



people in the EU are exactly those which are believed to have the highest potential in the Western Balkan countries: biomass, wind and solar.

Two examples close to home include:

- Slovenia employs 3 800 people in the overall renewables sector, with the highest numbers in solid biomass, heat pumps and solar photovoltaic, while Croatia has created 3 400 jobs overall, with solid biomass and wind in the lead.
- Romania employed 18 950 people in the renewables sector, with 3 000 more than the lignite sector currently employs.

It is important to note that while the lignite sector employment figures have been on a constant downward trend, those in the renewables sector have been on the rise in the last four to five years.

For the time being, the access of renewable electricity to the grids in Western Balkan countries faces serious administrative hurdles. In BIH there is no priority or guaranteed access for producers of renewable energy in either entity, and the amount of wind capacity is very conservatively capped at 350 MW until 2019. Kosovo has a restrictive cap of 150 MW of wind capacity being connected to the grid until 2020. In Serbia investments in renewables are being held back by feed-in tariff quotas (500 MW for wind until 2020) and other administrative issues.

Renewable energy employment growth in the Western Balkans will depend on the political commitment to a strong investment trajectory, in other words a choice between a 40 year long lock-in that a lignite power plant creates or a more flexible renewables based sector, as well as on continued technological development and cost reductions.

Jobs in the renewable energy sector across EU-28, 2013 figures

Country	Country total	Solid biomass	Wind power	Photo voltaic	Biofuels	Heat pumps	Biogas	Small hydro power	Solar thermal	Waste*	Geothermal energy
Germany	363100	51600	137800	56000	25600	15800	49200	13100	12500	n.a.	1500
France	176850	52500	20000	26400	30000	32000	3500	3850	6700	650	1250
United Kingdom	98700	21000	36000	15600	3500	7350	2800	4950	800	6500	200
Italy	95200	20000	30000	10000	5000	11000	4200	4500	4000	1000	5500
Spain	60200	16000	20000	7500	5000	4700	500	1500	4500	500	<50
Sweden	50400	27500	4500	800	5000	8700	300	600	100	2900	<100
Austria	39750	18100	4500	4850	900	1300	500	6150	2900	450	100
Denmark	37500	3500	27500	500	1500	2500	200	<50	1200	600	<100
Poland	34850	19500	3000	<50	7500	650	500	1000	2500	<50	200
Finland	32350	24350	1500	<50	1000	5000	100	400	<50	<50	0
Belgium	21250	3300	3500	10000	2000	500	400	400	500	650	<50
Greece	20400	2700	1400	12000	700	0	100	1250	2100	n.a.	150
Netherlands	19900	3300	4000	6500	600	2800	700	<50	300	1300	400
Romania	18950	12500	2000	2500	1000	0	<50	500	250	n.a.	200
Czech Republic	14700	6900	250	1500	2800	650	1300	400	800	100	<50
Portugal	14500	7000	1500	750	1750	850	150	1700	600	200	<100
Hungary	7050	4400	100	<50	600	100	150	450	150	100	1000
Latvia	6150	5200	<50	<50	500	0	100	350	<50	n.a.	0
Bulgaria	5900	3000	250	1500	750	0	<50	400	<50	<50	<50
Lithuania	5250	3100	400	700	800	100	<50	150	<50	<50	<100
Ireland	4700	100	3500	<50	400	150	100	100	250	100	0
Slovakia	4450	2200	<50	200	1000	100	100	250	450	<50	150
Estonia	4400	3000	100	<50	<50	1300	<50	<50	<50	n.a.	0
Slovenia	3800	1750	<50	500	350	600	100	400	100	<50	<100
Croatia	3400	2100	400	200	250	0	<50	250	200	n.a.	<100
Luxembourg	700	150	<50	300	250	<50	<50	<50	<50	<50	0
Cyprus	600	<50	<50	200	<50	0	<50	0	400	n.a.	0
Malta	100	0	0	100	<50	0	<50	0	<50	<50	0

* direct jobs only

Approximate potential from energy efficiency retrofits/renewable energy based on EU experience

One of the most recent Commission reports¹⁶⁴ presents the potential for job creation in energy efficiency retrofits and deep building renovation as a result of a technical analysis of the long-term renovation strategies submitted by Member States under Article 4 of the Energy Efficiency Directive.

As the European building stock consumes approximately 40 per cent of primary energy and it is responsible for 36 per cent of greenhouse emissions in the EU¹⁶⁵, a step-up in the deep building renovation sector not only contributes to meeting Europe's emissions reduction targets but, as the report shows, in most of the EU Member States brings forward encouraging employment numbers.

The national renovation strategies that Member States have submitted to the Commission include a chapter on wider-benefits of deep building renovations, such as societal ones which put into perspective job creation in this sector.

This is very relevant for the Western Balkan countries as well, given that the Energy Efficiency and Energy Performance of Buildings Directives are already part of the Energy Community acquis and should have started implementation already in 2012. It shows that with sufficient planning and acknowledgement of the benefits, these measures are more beneficial and less costly than the current energy policy in the region, which relies heavily on generation capacities and too little on demand side management.

A few examples:

In the **Czech Republic**, the 'fast and deep' renovation scenario would contribute to savings of 18.6 PJ in the residential sector (25.4 PJ including other buildings outside industry). On the basis of a total investment in

building renovation reaching CZK 35-40 billion (EUR 125-145 million) per year as a result of implementing the renovation strategy, 35 000 new jobs will be created and GDP increased by one per cent¹⁶⁶.

In Greece's renovation strategy, wider benefits have been identified and quantified in detail e.g. for the environmental, health, more comfortable indoors temperature, employment (i.e. for each million euro investment, 21.1 jobs are created for basic building insulation), energy security and increased property value.

Slovenia too has provided a detailed analysis to quantify the additional benefits of energy savings. Wider benefits have been identified and quantified e.g. for the economy, energy security, social benefits (7 000 new jobs per year), reducing energy poverty and greenhouse gas and particulate emissions. The number of new jobs per year envisaged dwarfs the employment figure at Šoštanj 6, even if 7 000 turns out to be too optimistic.

Perhaps the most concrete example comes from Spain, whose national renovation strategy provides a clear picture of the main benefits (energy savings and CO2 emission reduction) of such a scenario. Moreover, it shows that investing in building renovation is seen as a strategically important action, especially in terms of employment: the report estimates 55 additional jobs created for every million of public spending in the sector.

This is only part of the wider 'energy transformation' and the benefits that it can bring in terms of employment and environmental improvements. It is an important example that governments in southeast Europe should be inspired by and fast track in their national priorities.

¹⁶⁴
http://iet.jrc.ec.europa.eu/energyefficiency/system/tdf/syntesis_report_building_renovation_strategies_online_fin.pdf?file=1&type=node&id=9117

¹⁶⁵
<https://ec.europa.eu/energy/en/topics/energy-efficiency/buildings>

¹⁶⁶
http://iet.jrc.ec.europa.eu/energyefficiency/system/tdf/syntesis_report_building_renovation_strategies_online_fin.pdf?file=1&type=node&id=9117, page 59

CONCLUSIONS

This study finds that the promised employment figures are exaggerated for the planned lignite power plants of the Balkans, in all cases where sufficient information is available. In fact, it shows that in all the countries analysed the levels of employment are on a descending trend, while energy companies are faced with economic uncertainties and difficulties in maintaining current levels of employment.

Bosnia and Herzegovina has suffered from a long term lack of capital investments in electricity production and a long history of state subsidies for the lignite mining sector. The country's participation in the Energy Community means that with the progressive opening of the electricity market, BIH is being exposed to competition from countries like Bulgaria and Romania which are net exporters of electricity, so there will be pressures to keep prices down. BIH therefore needs to weigh carefully which investments are worth making and which are in danger of ending up as stranded assets due to their high investment and operational costs. The only coal power plant built in recent years in the country – the 300 MW Stanari – highlights issues that are likely to be relevant for other plants in the region. For the construction stage, 1200 workplaces were promised but in reality, figures cited by the media once construction was underway suggested that there were about 400-450 workers from BIH, along with 350-400 Chinese workers. This means that only slightly over one third of the proclaimed workplaces for construction materialised for local workers.

Kosovo has been planning a new lignite unit for over ten years, but to this point no official information is available about expected the employment at the plant that is expected to generate 3370 GWh of electricity/year. The preferred bidder for this plant, ContourGlobal,

may be the regional prize winner for most outrageous claims regarding coal plant employment, with promises of 10 000 workplaces during construction and 500 once the plant comes online. There is no reason that a plant with a similar capacity to Šoštanj 6 in Slovenia would require two and a half times more employees, nor that construction would need over ten times more than the recently built Stanari power plant in Bosnia and Herzegovina.

In **Macedonia**, reviews of existing studies about the availability of lignite on the eastern fringe of the Pelagonia basin, which hosts the three Bitola power plant units, lead to the overall conclusion that even if two new lignite mines were to be opened in the region, Macedonia would still need to start importing coal from 2025 onwards. The state-owned utility that operates both the lignite power plants and mines has plans to develop an underground mine at Sudovol, but there is no information available about the number of jobs this mine expansion would bring, nor for what period of time. All we know is that Macedonia has no experience in underground mining, which may mean the jobs in this planned mine would be imported. Such a struggle for domestic fuel resources may win Macedonia the regional prize for the most unrealistic coal development pathways and signals an urgent need for diversification and a well thought through transition plan for the people that depend on coal jobs.

The new unit planned at Pljevlja in **Montenegro** is promoted to tackle the small town's two biggest problems: air pollution and unemployment. This is just wishful thinking. The project does not include the construction of a district heating system, so smoke from individual stoves will persist, and jobs are likely

to further decrease rather than increase. The feasibility study for the new plant estimates that 147 workers will be employed. Generation will be around 1700 GWh annually. This would make 11.5 GWh per worker, much less than Šoštanj 6 with 17.5 GWh per worker, in a situation where Šoštanj 6 has huge financial problems. This may lead to further decreasing the number of workers at Pljevlja. As for the mine, in order to reduce the coal production cost to a potentially-feasible level, Fichtner has calculated that the number of employees in the mine would need to be reduced to 544 or 520, depending on the scenario, by around 2025, compared to 872 in 2016.

Greece seems to be the regional prize winner for lignite mining productivity per employee: with an average of 14 710 tonnes per year per worker, which should put things into perspective for mine operators in the rest of the countries of the study if they are planning to be anywhere near competitive in an open European energy market. One mine in BIH currently has production as low as 515 tonnes per worker per year, and one mine in Serbia has 4 650 tonnes per worker. The mine operator in Greece had to make lignite production more competitive and keep operational costs at a minimum, given that tougher EU environmental standards and renewable energy commitments are pushing lignite out of the country's energy mix, so the number of employees in mining has dropped from 4 108 in 2011 to 3 417 in 2014.

Serbia also qualifies for a regional prize, that is the one for the least transparency about information related to employment in both existing and planned lignite power plants. Even though the government has signed a financing agreement with China's ExIm Bank for the construction of a new 350 MW unit at Kostolac

B power plant and for the expansion of nearby Drmno mine, there is no environmental impact assessment for the mine expansion, nor does the government plan such a process, according to a decision from 2013. With regards to the new lignite unit, only a few media articles speak about 600 jobs in the construction phase, most likely to be equally divided between Chinese and Serbian workers, as in the case of Stanari in BIH, but not a word about long-term jobs in the plant's operation or in other alternative sectors.

Romania is the only country in the region which has gone through a socially-failed process of hard coal mine closures in the early 2000s and also the only country in the region that currently employs more people in the renewable energy sector than in the lignite one. Production of coal-based electricity has shrunk from 37 per cent in 2011 to 25 per cent in 2015, as renewables grew from two to 15 per cent. Plans to build a new 600 MW unit at the existing Rovinari power plant have been around for over five years, but it is unlikely that these will materialise given the steep downward trend in lignite production. It is perhaps the most urgent country where the government must recognise that a transition to a cleaner energy system is necessary, while ensuring that the transition is a just one, with adequate planning, financing and the inclusion of workers in decision-making.

Romania and other countries like the UK that have undergone poorly planned closures in the coal mining sector serve as a lesson that thorough participatory and transparent planning needs to take place for moving coal mining communities beyond coal to a more diverse and sustainable economy. In short, a just transition needs to be planned and implemented urgently.

RECOMMENDATIONS

Governments and companies need to stop making exaggerated claims about employment in the coal sector and should examine the numerous other ways to stimulate jobs, especially in the household energy efficiency renovation sector.

Social and employment vulnerability assessments need to be undertaken for existing coal mines and plants.

Workers' education and training on climate-friendly and climate-resilient technologies need to be promoted by governments as part of capacity-building strategies

Decommissioning and rehabilitation plans for coal mines, ash dumps and power plants planned for closure need to be drawn up and their labour requirements calculated.

Coal-affected communities need to start inclusive processes for envisioning and planning a future beyond coal.

Provisions for a just transition away from coal need to be included in state-level energy and climate policies and local development plans. These need to be widely consulted at a stage where all options are still open.

Administrative barriers such as grid quotas for renewable energy need to be reviewed to ensure that states are making the maximum use of sustainable renewable energies.

States and regions need to consider how to use EU funds to the best effect for transforming mining communities, and the EU needs to ensure that such funds are available also in pre-accession countries.

“ In several southeast European countries, new coal-fired power plants are planned. This is in contrast to most of the EU, where no new coal plants are planned, due to their climate and health impacts, and their poor economics. These plans for southeast Europe are accompanied by promises of creating new workplaces or saving current ones. This study examines these claims and finds that in almost all cases, they are exaggerated. In fact, even the current levels of employment cannot be maintained in most cases, so a fair and inclusive plan is needed to transform coal-dependent communities. “