Coal and Peat in the Western Balkans and Ukraine

Dr Hrvoje Medarac

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https://recruitment.jrc.ec.europa.eu/
Why?

EU policy

• 2050 target: Europe as climate neutral continent
• 2030 target: 55% reduction of GHG emissions
• Decarbonisation of power sector in EU

Western Balkans and Ukraine

• Members of the Energy Community- need to implement core EU energy legislation
• Sofia Declaration at the Western Balkans Summit (2020)- 2050 climate commitments
• 21st EU-Ukraine Summit (2019)- progressive integration of UA to EU energy market
Research context- cooperation with DG ENER

Series of Science for Policy Reports on Coal Regions in Transition

2018: EU coal regions: opportunities and challenges ahead (Alves Dias et al, 2018)

2020: Clean energy technologies in coal regions: Opportunities for jobs and growth (Kapetaki et al, 2020)

2021: Recent trends in EU coal, peat and oil shale regions (Alves Dias et al, 2021)

2021: Recent trends in coal and peat regions in the Western Balkans and Ukraine (Ruiz, Medarac et al, 2021)
2018 Coal and Peat Statistics (Eurostat)

Production of coal and peat (Mt)

- Montenegro: 1.6
- North Macedonia: 5
- Albania: 0.3
- Serbia: 37.6
- Bosnia and Herzegovina: 14.5
- Kosovo*: 7.7
- Ukraine: 26.3

Coal and Peat

Coal: dark green
Peat: light green

Coal import and export (Mt)

- Montenegro: Import 0.1, Export 0.1
- North Macedonia: Import 0.1, Export 0.1
- Albania: Import 1.4, Export 1.6
- Serbia: Import 0.8, Export 0.1
- Kosovo*: Import 0.1, Export 0.1
- Ukraine: Import 22.2, Export 0.1

* This designation is without prejudice to positions on status and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.
### Historical coal production and imports in Ukraine

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal Production (Million tonnes)</th>
<th>Coal Import (Million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>55</td>
<td>12</td>
</tr>
<tr>
<td>2011</td>
<td>63</td>
<td>13</td>
</tr>
<tr>
<td>2012</td>
<td>66</td>
<td>15</td>
</tr>
<tr>
<td>2013</td>
<td>64</td>
<td>15</td>
</tr>
<tr>
<td>2014</td>
<td>46</td>
<td>16</td>
</tr>
<tr>
<td>2015</td>
<td>34</td>
<td>17</td>
</tr>
<tr>
<td>2016</td>
<td>36</td>
<td>17</td>
</tr>
<tr>
<td>2017</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>2018</td>
<td>26</td>
<td>22</td>
</tr>
<tr>
<td>2019</td>
<td>26</td>
<td>22</td>
</tr>
</tbody>
</table>

- **Beginning of conflict**: Production -60%
- **Imports +47%**

- **New energy strategy**
Coal mines

65 mines in 12 regions

93 Mt of coal produced in 2018

• Hard coal - Ukraine

• Lignite - Western Balkans

Largest mines

• Serbia (28.4 Mt and 8.6 Mt)

• Kosovo* (7.7 Mt)

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Coal in power generation

Share of coal in power generation in WB&UA

Evolution of share of coal in power generation from 2014 to 2019

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52 power plants (35 GW) in 26 regions

Installed coal power capacities in 2018 [GW]

- Ukraine, 26.1
- Serbia, 4.4
- Bosnia and Herzegovina, 2.0
- Kosovo*, 1.3
- Montenegro, 0.2
- North Macedonia, 0.8

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### Direct employment in the coal sector in 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Mining jobs</th>
<th>Power plant jobs</th>
<th>Overall jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukraine</td>
<td>55,599</td>
<td>40,749</td>
<td>96,348</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>14,472</td>
<td>2,466</td>
<td>16,938</td>
</tr>
<tr>
<td>Serbia</td>
<td>12,331</td>
<td>2,931</td>
<td>15,262</td>
</tr>
<tr>
<td>Kosovo*</td>
<td>3,249</td>
<td>1,482</td>
<td>4,731</td>
</tr>
<tr>
<td>North Macedonia</td>
<td>2,980</td>
<td>678</td>
<td>3,658</td>
</tr>
<tr>
<td>Montenegro</td>
<td>750</td>
<td>171</td>
<td>921</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>89,381</strong></td>
<td><strong>48,477</strong></td>
<td><strong>137,858</strong></td>
</tr>
</tbody>
</table>

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Coal mining productivity

Significantly lower productivity than in EU (755 t/FTE compared to 4730 t/FTE)

Lower productivity in Ukrainian regions (389 t/FTE) than in Western Balkans (1632 t/FTE)

Productivity distribution for underground (UG), open pit (OP) and mixed (UG&OP) mines in the EU, Western Balkans (WB) and Ukraine (UA) mines
Benchmark of coal power plants

Average age 44 years in 2018 (35 in EU)

Higher employment intensity (1.67 jobs/MW compared to 0.4 jobs/MW in EU)
### Indirect employment in the coal sector in 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Intra-regional</th>
<th>Inter-regional</th>
<th>Total indirect jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montenegro</td>
<td>195</td>
<td>866</td>
<td>1,061</td>
</tr>
<tr>
<td>North Macedonia</td>
<td>1,084</td>
<td>2,843</td>
<td>3,927</td>
</tr>
<tr>
<td>Serbia</td>
<td>8,878</td>
<td>28,830</td>
<td>37,708</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>11,988</td>
<td>1,262</td>
<td>13,250</td>
</tr>
<tr>
<td>Kosovo*</td>
<td>946</td>
<td>4,021</td>
<td>4,967</td>
</tr>
<tr>
<td>Ukraine</td>
<td>58,786</td>
<td>11,698</td>
<td>70,484</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>81,877</strong></td>
<td><strong>49,522</strong></td>
<td><strong>131,398</strong></td>
</tr>
</tbody>
</table>

- **0%**  | **20%**  | **40%**  | **60%**  | **80%**  | **100%** |

- [Graph showing distribution of direct and indirect employment by country]

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Future developments for the coal sector
Based on national energy strategies (2014-2020)

<table>
<thead>
<tr>
<th>Country</th>
<th>Strategy/Risk Foresight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montenegro (2014)</td>
<td>Pljevlja I closed until 2035 (new government plan)</td>
</tr>
<tr>
<td>North Macedonia (2020)</td>
<td>Full coal phase-out by 2027 (NECP)</td>
</tr>
<tr>
<td>Serbia (2015)</td>
<td>Decommissioning all coal power plants below 300 MW until 2024 (strategy)</td>
</tr>
<tr>
<td>Bosnia and Herzegovina (2017)</td>
<td>Power plants Tuzla 3 and 4 and Kakanj 5 and 6 decommission before 2030 (strategy)</td>
</tr>
<tr>
<td>Kosovo* (2017)</td>
<td>Kosovo A refurbished and still operational in 2030 (strategy)</td>
</tr>
<tr>
<td>Ukraine** (2017)</td>
<td>Imported coal decommissioned first (saving mining jobs)</td>
</tr>
</tbody>
</table>

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** Ukrainian energy strategy projects 52% decrease of primary supply of coal by 2030.
## Jobs at risk in coal mines

### Chart

<table>
<thead>
<tr>
<th>Country</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montenegro</td>
<td>750</td>
<td>-</td>
</tr>
<tr>
<td>North Macedonia</td>
<td>3 000</td>
<td>-</td>
</tr>
<tr>
<td>Serbia</td>
<td>3 000</td>
<td>-</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>5 400</td>
<td>8 100</td>
</tr>
<tr>
<td>Kosovo*</td>
<td>1 500</td>
<td>750 - 28 000</td>
</tr>
<tr>
<td>Ukraine</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Under UN Security Council Resolution 1244/99

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### Chart

- **Mining jobs in 2018**
- **Mining jobs at risk by 2030 min**
- **Mining jobs at risk by 2030 max**

*Under UN Security Council Resolution 1244/99
Jobs at risk in coal power plants

- Montenegro: 170
- North Macedonia: 680
- Serbia: 700
- Bosnia and Herzegovina: 540 - 1,200
- Kosovo*: 780
- Ukraine: 15,000 - 15,800

*under UN Security Council Resolution 1244/99

[Graph showing job risk in various countries]
Regional distribution of jobs at risk by 2030
Carbon intensive industries

Iron and steel industry

Cement industry

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Carbon intensive industries

The most intensive use of coal for industry happens in the Eastern regions of Ukraine
(for iron and steel production)

Western Balkans:
- all regions below 1Mt/year
Peat in Ukraine

0.6 Mt of peat produced in 2018 by around 500 employees
Key points

1. 93 Mt of coal produced in 2018 (like 20% of EU coal production)
2. 40% of power generated from coal (20% in EU)
3. 138 000 employees in the coal sector (like 2/3 of EU coal sector)
   • Geographically: 96 500 in Ukraine and 41 500 in Western Balkans
   • By sector: 89 500 in coal mining and 48 500 in coal power plants
4. Less productive mines and older power plants than in EU
5. Between 29 000 and 64 000 jobs at risk by 2030
6. 20 Mt of coal for iron and steel compared to 2 Mt for cement production
7. Use of peat is negligible compared to use of coal
Keep in touch

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Thank you

Contact e-mails: Hrvoje.MEDARAC@ec.europa.eu
Jose.MOYA@ec.europa.eu

Report available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC126154

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