Coal mining in Slovakia and Environment
Coal Mining in Slovak Republic - history

Map of Hanlova – Novaky coalfields from year 1900
From beginning of industrial coal mining was in HBP, a.s. collieries mined in total 227,72 mil. tonnes of coal. On all fields of Slovakia was during whole history (120 years) mined around 230 million tonnes of coals.

<table>
<thead>
<tr>
<th>Year (metric tonnes)</th>
<th>Colliery Handlová</th>
<th>Colliery Cigel’</th>
<th>Colliery Nováky</th>
<th>HBP, a.s. Total</th>
<th>Dolina mine</th>
<th>Záhorie/Čáry mine</th>
<th>Slovakia total</th>
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<td>1907</td>
<td>5 984</td>
<td>0</td>
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<td>5 984</td>
<td>0</td>
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<td>1940</td>
<td>792 887</td>
<td>0</td>
<td>100</td>
<td>792 987</td>
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<td>792 987</td>
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<td>672 737</td>
<td>0</td>
<td>208 500</td>
<td>881 237</td>
<td>22 278</td>
<td>0</td>
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<td>1960</td>
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<td>0</td>
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<td>2 465 239</td>
<td>549 351</td>
<td>0</td>
<td>3 014 590</td>
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<td>1970</td>
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<td>1 376 300</td>
<td>1 633 899</td>
<td>4 403 933</td>
<td>715 700</td>
<td>0</td>
<td>5 119 633</td>
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<td>2 080 144</td>
<td>1 256 201</td>
<td>4 816 995</td>
<td>979 628</td>
<td>0</td>
<td>5 796 623</td>
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<td>1 354 050</td>
<td>1 308 819</td>
<td>3 917 869</td>
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<td>1 000</td>
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<td>920 000</td>
<td>1 101 334</td>
<td>2 901 334</td>
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<td>384 000</td>
<td>3 638 334</td>
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<td>365 200</td>
<td>409 400</td>
<td>1 538 100</td>
<td>2 312 700</td>
<td>163 000</td>
<td>35 000</td>
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<td>482 300</td>
<td>1 253 429</td>
<td>2 054 579</td>
<td>146 000</td>
<td>6 202</td>
<td>2 206 781</td>
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<td>415 000</td>
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<td>1 945 000</td>
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<td>22 000</td>
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<td>565 500</td>
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<td>152 000</td>
<td>87 100</td>
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<td>2009</td>
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<td>575 000</td>
<td>1 476 000</td>
<td>2 277 000</td>
<td>139 700</td>
<td>152 300</td>
<td>2 569 000</td>
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<td>2010</td>
<td>318 000</td>
<td>288 000</td>
<td>1 453 000</td>
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<td>175 134</td>
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<td>583 000</td>
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<td>603 500</td>
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<td>2 085 000</td>
<td>83 000</td>
<td>179 000</td>
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<td>606 000</td>
<td>1 093 000</td>
<td>1 952 000</td>
<td>69 500</td>
<td>166 200</td>
<td>2 187 700</td>
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Coal Deposits in Slovak Republic


Coal Deposits mined out until 2WW: 15. Jedlove Kostolany, 17. Badin


Anyway, for „next generations“ we have around 1000 million (one billion) tonnes of lignite coal reserves.
Surface (Opencast) coal mining in past

Panoramic view (up) and aerial view (left) to former opencast coal mine at Lehota pod Vtácnikom, where was mined 2 million tonnes of coal on open pit, until 1990.

Former carrier is completely reclaimed and used as farmland.

Waste rock heap on horizon is forested

Picture source: K. Ivan & www.mapy.cz
Slovakia has no other significant energetic fossil fuels than lignite and semibituminous coal.

Our oilfields are exhausted and domestic natural gas production is minimal – up to 86 mil. cubic metres p.a. Natural gas consumption is 6 billion cubic metres p.a.

98% of natural gas is imported, mostly from Russian Federation.

Besides lignite must be the consumption of solid fuels covered by imports.

Left is the graphic expression of Slovak coal consumption in 2015 (kilotonnes). Domestic lignite production – orange colour – covers only 1/3 of Slovak annual coal consumption.

Majority of hard coal consumed annually is used for metallurgy and for home & industrial heating, mostly for private houses and in central heating stations in major towns.

Source: Slovak statistical Office 2016
After graphic evaluation from Slovak Statistic Office data about power production (GWh) by months for year 2015 is clear, that hydro power station output (blue) having significant oscillation during year, because is heavily dependant from actual weather and rain.

Rain, sunshine and wind are unpredictable for any year. Coal mining and its use as energy source is weather independent and predictable.

From domestic coal is during year produced 15% to 20% of total Slovak power consumption.

Picture source: Slovak statistic office & HBP p.l.c.
Thermal Powerstation ENO modernisation 2015

At year 2015 was two blocks of ENO (both 110 MWh) completely overhauled for some pollutant capture:

- renewed desulphurisation unit captured 97% of produced sulphur oxides
- New implemented denitrification technology decreased NOx gasses well below EU legislation
- Overhauled filtering equipment catches 98% of flying ash from boilers
Thermal energy used for central heating system

Thermal power station ENO producing per year approximately 800 000 Gigajoule of thermal energy used for two towns central heating and warm water production:

- Town Prievidza (60 000 inhabitants)
- Town Novaky (8 000 inhabitants)

- including their schools, kindergartens, industrial plants, sports halls, swimming pools and culture houses
- When once will be powerplant ENO switched off, this energy must be replaced from other sources

Pictures source: Slovak Power Stations, Inc.
HBP a.s. company use of geothermal energy: 10 Megawats

Conference: Sustainability of Mineral Resources and Environment

Geothermal well S1-NB2
Glasshouse Novaky: 5,3 Megawats of geothermal energy

- There are 2 glasshouses
- For glasshouse heating is used energy from geothermal well and from mine water
- Total production of tomatoes is 1,47 mil. Kg per annum, what is 19,1% from domestic tomato production
- Because there is still reserve of 2,7 MW of thermal energy, we designing another two greenhouse to be built in next years there
2014: Fish farm construction at Handlova colliery
Handlová geothermal energy – fish farm and glasshouse

- Project is based in African catfish (Clarias gariepinus) rearing, heat and water used for farm is gained from water and air from living mine.
- Projected annual production capacity is 1000 tonnes of fishes.
Side effect from underground coal mining wetlands & swamps

- Violet color – existing wetlands and ponds after underground mining
- Blue color – big lake which will be created in coming years
After-mining wetlands & swamps

Photo source: Kromkova
Wetlands & swamps life

By EIA study for new mining fields (2006) was on our ponds and wetlands observed presence of 85 preserved animal species:

- 6 preserved amphibians
- 5 preserved reptiles
- 69 preserved birds
- 5 preserved mammals

There was found many of rare plants, and also one of that, which was previously considered as exticted in Slovakia

Schoenoplectus mucronatus (Bog bulrush)

Himantopus himantopus – on Novaky wetlands was observed the second nesting of this bird, first nesting was observed on Senne pods, which is Ramsar agreement locality
Most valuable animals living in mining wetlands and ponds

Bull Bog, Hyla Arborea, Sea Eagle, Marsh harrier, Musk rat, European Beaver
Actually we have about 100 hectares of swamps, wetlands and waterponds over our mining fields.

On coming years will be the water covered yardage doubled or tripled
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Thank you for your attention