



**HORNONTRIANSKE BANE
PRIEVIDZA, a.s.**

CMM – Coal Mine Methane Utilization from the East Shaft Colliery *(The Handlova Mining Area, Slovakia)*

- ▶ Geology
- ▶ Coal Mine Methane
- ▶ Underground Degasification
- ▶ Degasification on Surface
- ▶ Power&Heat Production
- ▶ GHG and Kyoto





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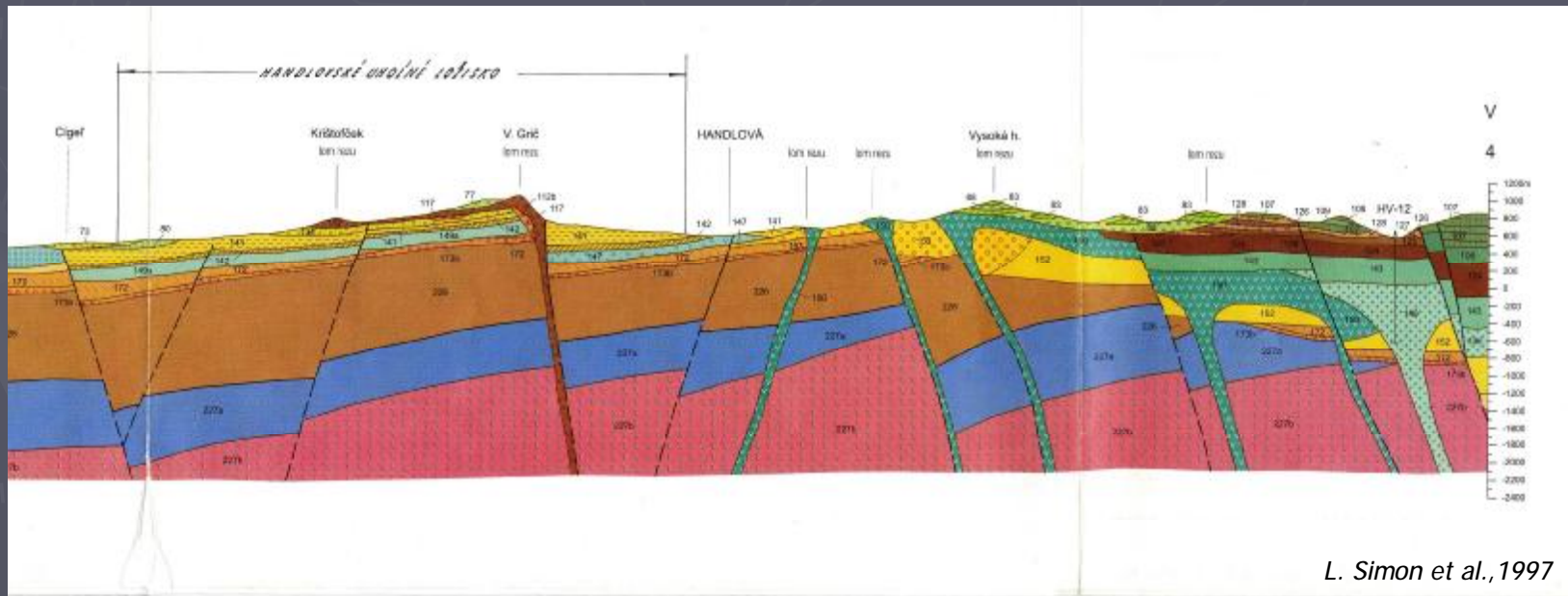
Slovakia





Geology

- ▶ The Handlova Coal Deposit – Tertiary – Neogene Age of Coal
- ▶ Subtimenous Coal with approx. 20 MJ/kg LHW
- ▶ Underlying rocks – tuffites of the Stiavnica Stratovolcano
- ▶ Overlaying rocks – clays and claystones
gravels
- andesites – the Vtacnik Volcano



L. Simon et al., 1997



Coal Mine Methane - CMM

- ▶ Methane – product of geochemical conversion of organic parts from deeper coal seams underlying geological formations
- ▶ In many cases methane stays inside the coal seams
- ▶ Methane creates dangerous and risky conditions underground for miners
- ▶ Methane is explosive in concentration with air in range between 5–15 of volume %
- ▶ Methane has special requirements for electric equipments underground
- ▶ Methane Collieries need adequate ventilation system connected with adequate monitoring system to protect miners

- ▶ When enormous volume of methane a degasification system has to be applied
- ▶ Following the degasification system and process we can think of CMM utilization
- ▶ There is also a possibility to use methane from closed mines



Underground Degasification – II.

- ▶ Mining area within the East Shaft equals approx. to 6 km²
- ▶ Proved exploitable reserves calculated at about 3,000,000 tons
- ▶ Production a year - with two longwall faces: 300,000 – 400,000 tons of coal
- ▶ A Study to evaluate methane productivity was done:
 - Active degasing sources – H1-H3, H8-H12 and DV-1 (degasing boreholes, sea-walls against longwal goafs with pipes)
 - Some degasing sources in reconstruction – H4 – H7
 - Degasing sources in future – H13 – H22
- ▶ Capacity of all sources for 5 years of mining and degasing (10 longwall panels) under 50% efficiency equals to 5,250,000 m³ of CH₄ in concentration as of 40%



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Underground Degasification – III.

(pictures from underground)





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Underground Degasification – IV.

(pictures from underground)





Degasification on Surface – I.

- ▶ Separate degasification station - unit
- ▶ Gas – pipes shared with the mining nitrogen self-ignition and fire-fighting system
- ▶ Dispatching room shared with the cogeneration unit
- ▶ Possible to use after closing-down the colliery



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Degasification on Surface – II.





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Power&Heat Production - I.





Power&Heat Production - II.

- ▶ Project finished in 2007 year
- ▶ Type of Cogeneration CHP unit: TEDOM CENTO SP160 BIO – 2 pcs each in 160 kWe and 220 kWt

Some Results as of 2007 year:

- ▶ Operating hours: 4,896
- ▶ Power production: 549,966 MWhs
- ▶ Power supply: 502,630 MWhs
- ▶ Heat production: 3122,4 GJ
- ▶ Heat consumption: 1473 GJ

Some Results as of 2008 year:

- ▶ Operating hours: 3,918
- ▶ Power production: 323,846 MWhs
- ▶ Power supply: 295,631 MWhs
- ▶ Heat production: 2096,7 GJ
- ▶ Heat consumption: 1528 GJ



GHG and Kyoto

- ▶ Methane is not trading GHG under ETS mechanism
- ▶ But possible to reduce and trade through JI – ERU units
- ▶ Also possible to trade through AAU units (Assigned Amount Units) under rules of Ministry of Environment e.g. Green Investment Scheme
- ▶ We suppose degasified and CHP used coal mine methane in approx. amount of more than 1 million cubic metres CH₄ /year what equals to approx. 15,000 tons of CO₂ equivalent/year
- ▶ The approved baseline and monitoring methodology ACM0008 is applied to the project activity

BUT REMEMBER – FIRST YOU HAVE TO SOLVE MINERS SAFETY !

OF COURSE WE CAN HELP TO SOLVE THE WORLD CLIMATE CHANGE PROBLEM



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