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Pre-feasibility study for Project: ”Mitigating Climate Change through Attracting FDI in Advanced Fossil Fuel Technologies”

Background information on the Project

- 9 countries participate: Afganistan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, and Uzbekistan
- Overall goal: enhancing capacities to attract and absorb FDI into advanced fossil fuel technologies for electricity generation
- One of the principal goals: increasing skills to develop pre-feasibility studies on the power sector and related fossil fuel projects in each targeted countries.
- Pre-FS includes technological, financial and economic risks, as well as regulatory and policy elements

Background information on the Project

* Pre-FS will serve as an example of establishment of the long-term power generation investment blueprint

* Underground coal gasification is a clean coal technology
* The UCG is a proven underground combustion process aimed at production of a synthetic gas (syngas) that can be economically used for the various purposes
* Lack of the attention to this technology at the international level, and
* Requires greater speed and scale , which might be stimulated by stronger governmental policies and measures

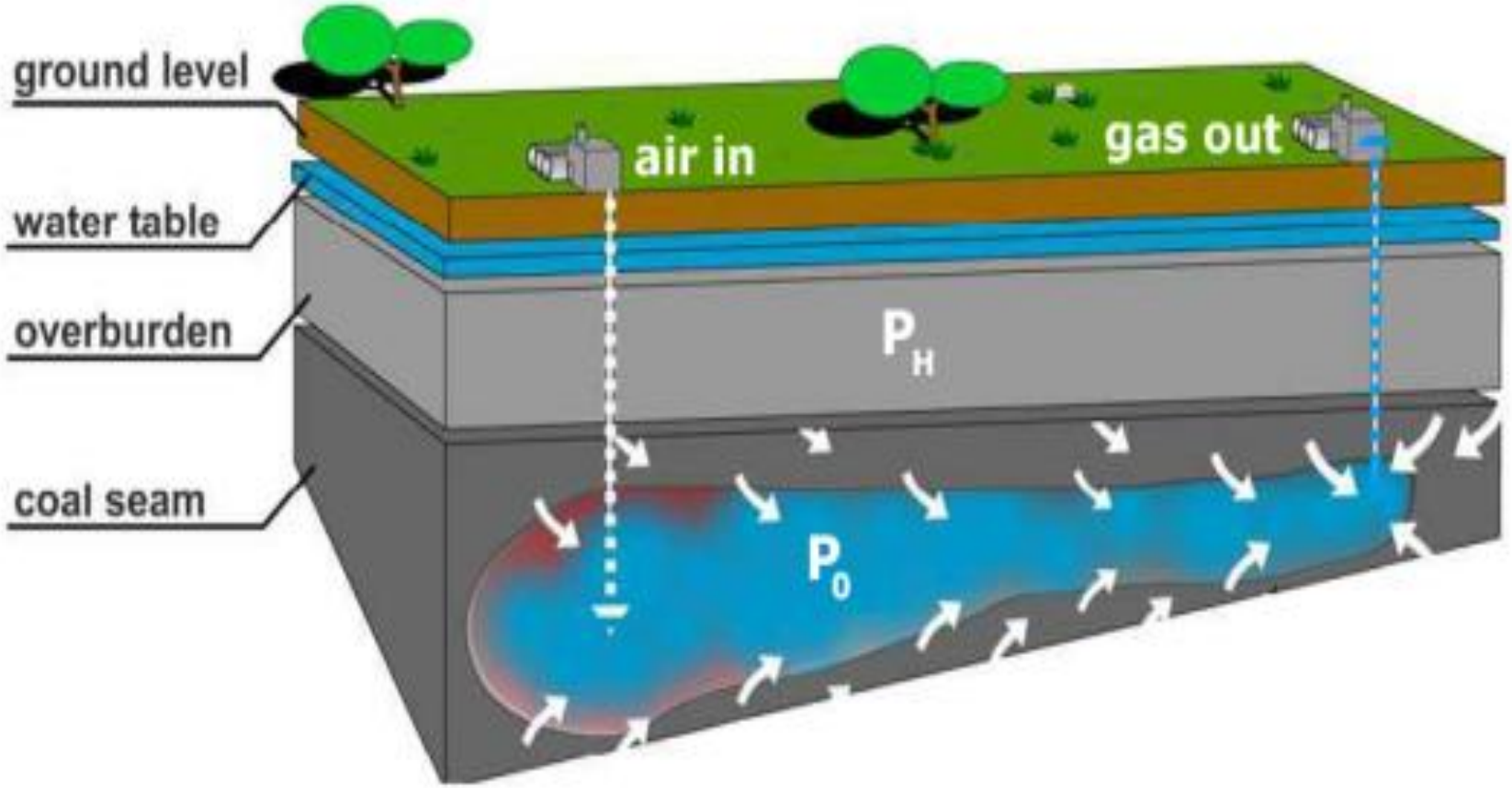
* Example from Kazakhstan

UCG in Kazakhstan

- An alternative for the currently used methods of coal mining and combustion
- Nijne-Ili coal deposit (Southern Balkhash, 300 km from Almaty) is a potential site for introduction of power generation from synthetic natural gas.
- Due to its deep underground location, this coal is not accessible for open type of excavating: most of it lies under waters of Ili River and is saturated by moisture, thus it is also not available for underground type of mining.
- Complex approach in developing earth interior and extraction system in for satellite minerals an deposits.

* Underground Coal Gasification is a gasification process carried on in non-mined coal seams using injection and production wells drilled from the surface, enabling the coal to be converted in-situ into product gas.

* UCG: Technical Aspects



*Coal gasification

UCG: Advantages

- Specific advantages of implementation of a large underground gasifier based on Nijne-Iliyskiy coal include the following:
  - A practically unlimited supply of coal is available for gasification, no external coal and water supply is required to sustain the reaction.
  - The UCG process creates an immense underground gas and heat storage capacity, which makes the gas supply very stable and robust.
  - No ash or slag removal and handling are necessary since they predominantly stay behind in the underground cavities.

UCG: Advantages

- Optimal pressure in the underground gasifier promotes ground water flow into the cavity, thus confining the chemical process to the boundaries of the gasifier and preventing contamination of the underground environment.
- Gas can be supplied into existing gas transportation system of major gas pipelines “South Kazakhstan-Bukhara-Tashkent-Almaty”.
- With considered level of NGS production, coal reserves can last for hundreds years.

Environmental advantages

- Coal production and combustion create numbers of environmental problems.
  - GHG emission such as CO_2 and CH_4,
  - air pollutants such as SOx, NOx,
  - halogens and mercury,
  - solid wastes such as fly ash and slag, as well as
  - direct environmental concerns such as land disturbance, acid-mine drainage.
  - Land degradation
- UCG faces only some CO_2 emissions and almost none of the other above mentioned issues.

Thank you for your kind attention!☺