

Opportunities and challenges for scaling mine gas emission reductions in Karaganda region



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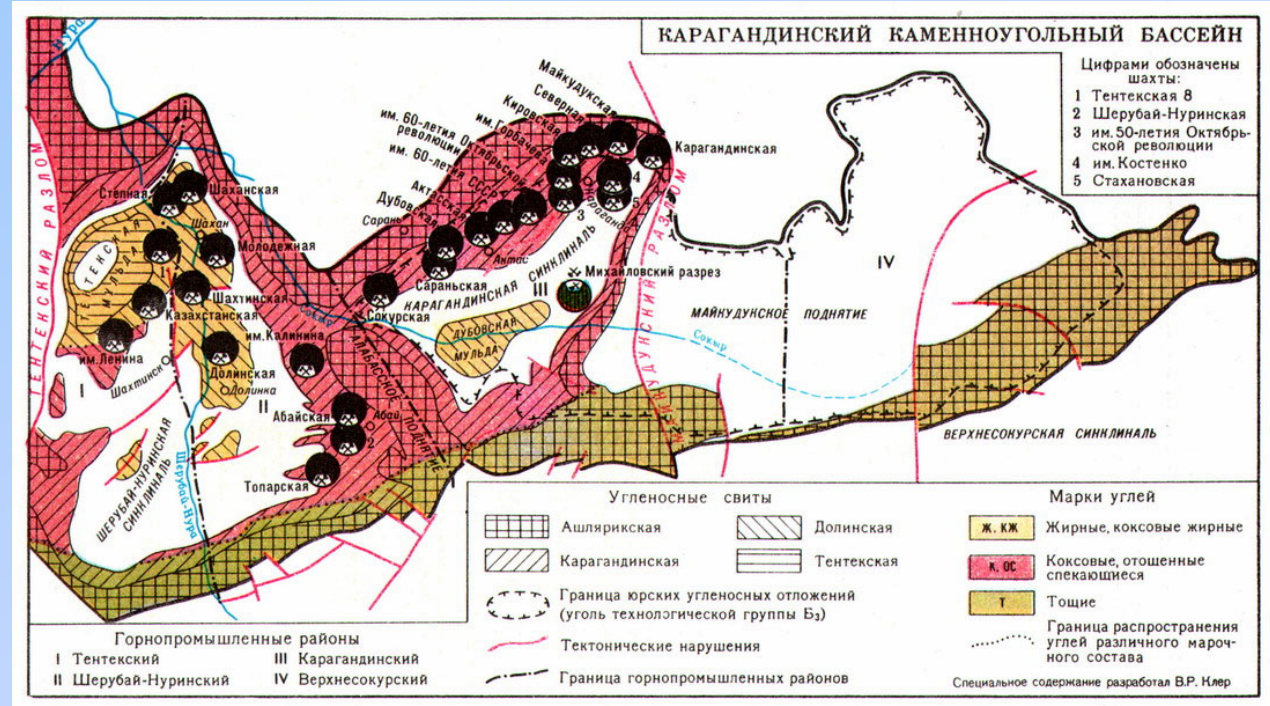
Key factors of Kazakhstan energy economy

- **Kazakhstan is one of the main coal producers in Central Asia and FSU region**
- **Kazakhstan is the main coal exporter to adjacent industrial regions**
- **Over 70% of Kazakhstan power generation rely on domestic coal**
- **Kazakhstan Metallurgical industry bases mainly on domestic coal (>80%)**
- **Social energy consumption of Central and Eastern Kazakhstan regions almost completely rely on coal based power generation**
- **Coal production in 1999 was 58 mln.ton and grown up to 109,2 mln.ton in 2020 with coal methane emission grown correspondingly**



Karaganda coal basin (a few key issues)

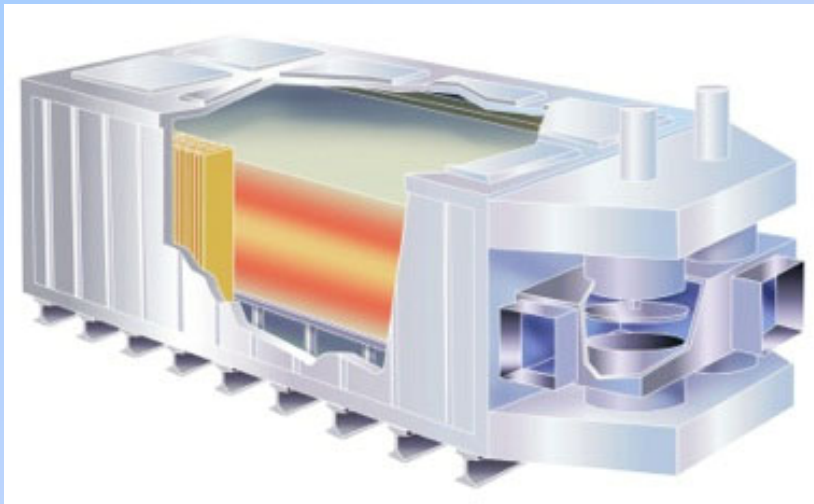
- Deep coal mines in Kazakhstan are predominantly located in the area or Karaganda
- The mines are managed by a single operator (AMT)
- The mines are subject to tough environmental and social regulations/policy over the recent years (including minegas emission)





Possible opportunities for emission reductions (1)

- CMM – a 10 MW CHP bidding is expected in 2023

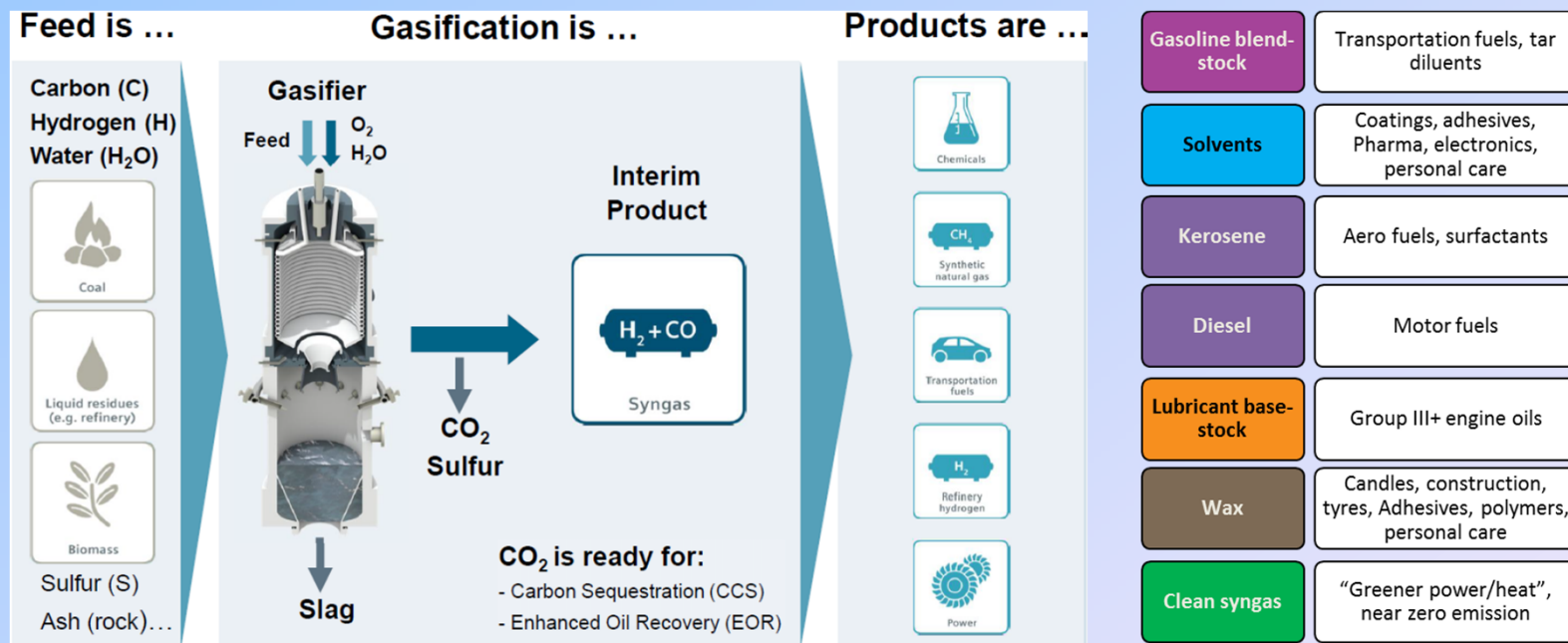


- VAM – the largest methane emissions in Karaganda is generated by mine ventilation



Possible opportunities for emission reductions (2)

- Gasification significantly reduce coal related hazardous emission while making it a valuable feedstock for many industries trough conversion into syngas and further transformation into liquid substances.



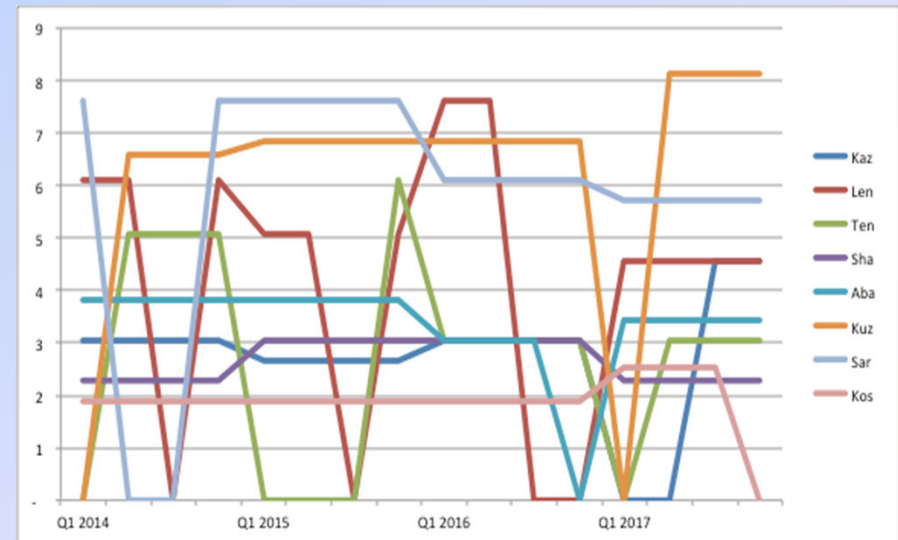
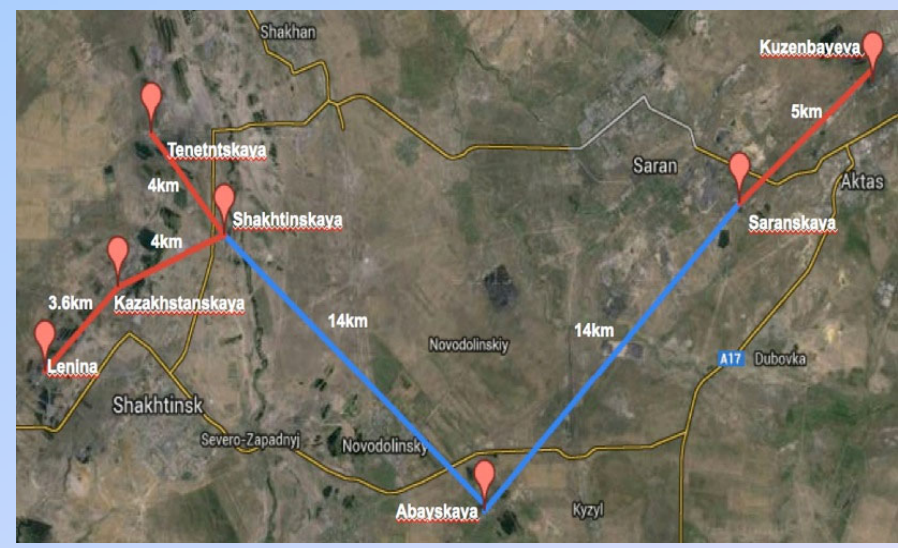
Courtesy of Siemens Fuel Gasification Technology GmbH & Co. KG

- Basis for improving economics of coal enterprises in socially sensible regions and reducing their environmental footprint.



Main challenges faced for implementation (1)

- Surface spacing of the mines' infrastructure compared with
- individual mine gas flow fluctuation may significantly challenge the project economics due to interruption in operation of mine gas utilization facilities.





Main challenges faced for implementation (2)



- **Greed connection complexity and low feed-in tariff**



- **Lack of “green” financing/emission reduction investment instruments and tax incentives**



Key conclusion:

- **Kazakhstan has a very attractive emission reduction potential – in coalmining sector specifically**
- **Increasing coal production is to stipulate coal operators to seek for economically viable solutions to deal with increasing methane emission**
- **There is a CMM/VAM project opportunities pipeline on the ground**
- **Implementation of coal gasification may help to significantly reduce coal-related emission avoiding compromise with mining sector**
- **Good access for CMM-based generated power along with reasonable feed-in tariff would stimulate project developers to deal with technical issues**
- **Legal support/incentives would provide necessary support for attracting emission reduction investment**



Thank you!



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