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# INNOVATIONS IN PGG

Katowice, December 2018



## Visualisation technology

- VR and RR technology implementation to handling machines and devices
- From technical support to device control





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## Electromobility

- Battery in electric drive used into underground transport with methane explosive atmosphere.



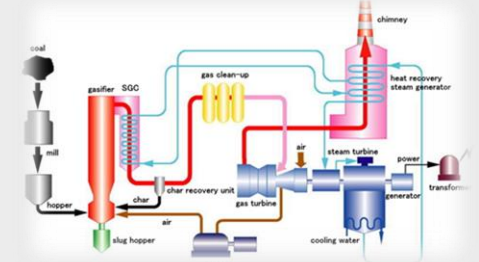
# Coal potential determination- Carbo Chemistry

- Technology progress enable the Company adaptation in terms of impact into environment.

**liquefaction**

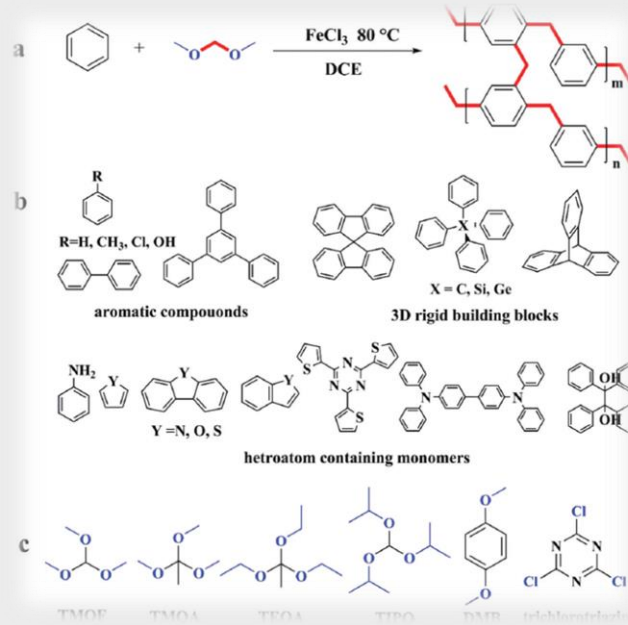


**gasyfication**



# Water treatment comprehensive system after the underground coal gasification process.

➤ Determination of decontamination method from harmful chemical substances in spaces remaining after coal gasification.



## Determination of the potential tasks realizing in renewable energy sources field

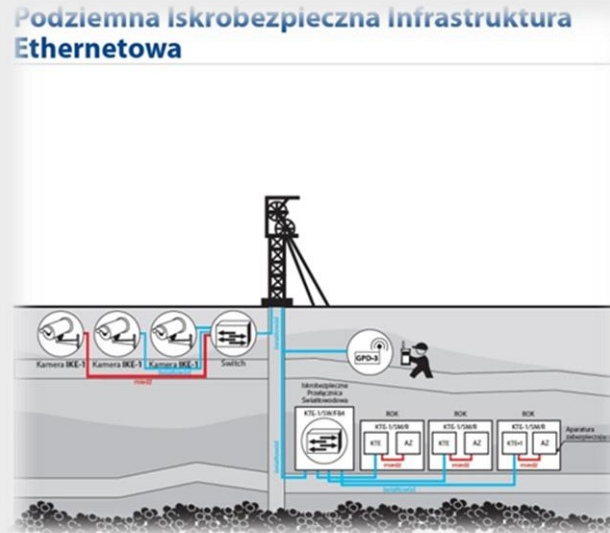
- Wind potential analysis in Company branches.





## Communication and data transmission

- Wireless, communication system development and data transmission evolution.





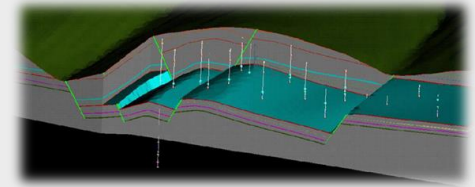
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## Data analysis - BIGDATA

### Underground mine 4.0



**BIGDATA  
Analysis**



**Production processes  
analysis  
Key Performance  
Indicators (KPI)**

**Control Centre support  
program**

**Predictive analysis  
program**



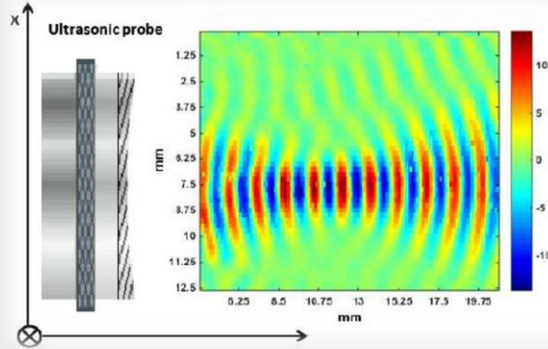
- Development of a program supporting the production processes optimization.

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## Wireless vibro-meters application



- Mine shaft and his primary part uninterrupted control
- Damage prediction
- Capability to expand with others elements, parameters





## Unmanned searching robot

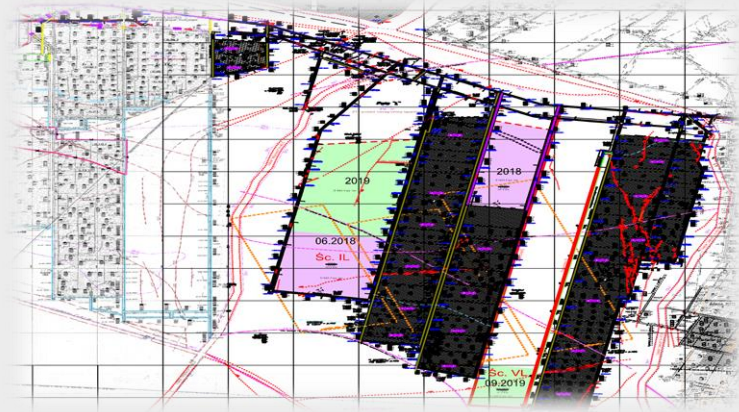
- Unmanned and penetrating device concept – inspections and excavation revisions





## Improving production security

- Early endogenous fire detection - online measurement





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# Thank you for your attention



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