2018 Workreport and Workplan for 2019

Chairman of ICE-CMM (CHINA)
General Manager of SCCG
Jin Zhixin

GENEVA
2018.09
01 Introduction of ICE-CMM in China

02 Completed work of ICE-CMM in 2018

03 Workplan of ICE-CMM for 2019

04 Concluding remarks
Introduction of ICE-CMM in China

**May 18th 2017**
UNECE and SCCG signed the MoU of ICE-CMM of China

**Sep 24th 2017**
The unveiling ceremony of ICE-CMM was signed and established and successfully organized the CBM forum.

The unveiling ceremony of ICE-CMM was a complete success.
01 Introduction of ICE-CMM in China

Global proven reserves (100 trillion tons) and output (trillion tons of oil equivalent) of coal in 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>U.S.A</th>
<th>Russia</th>
<th>Australia</th>
<th>China</th>
<th>India</th>
<th>Germany</th>
<th>Ukraine</th>
<th>Kazakhstan</th>
<th>Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>3.71</td>
<td>2.06</td>
<td>2.97</td>
<td>2.94</td>
<td>0.4</td>
<td>0.14</td>
<td>0.48</td>
<td>0.48</td>
<td>2.71</td>
</tr>
<tr>
<td>Proven reserves</td>
<td>25.09</td>
<td>16.04</td>
<td>14.48</td>
<td>13.88</td>
<td>9.77</td>
<td>3.61</td>
<td>3.44</td>
<td>2.56</td>
<td>2.28</td>
</tr>
</tbody>
</table>

Source: BP energy statistics yearbook 2018

Global distribution of CDM geological resources in 2016 (trillion m$^3$)

- **Russia**: 79.92 trn m$^3$
- **U.S.A**: 49.16 trn m$^3$
- **China**: 31.13 trn m$^3$
- **Australia**: 14.15 trn m$^3$
- **Canada**: 14.15 trn m$^3$
- **Indonesia**: 12.31 trn m$^3$
- **Poland**: 12 trn m$^3$
- **France**: 10.41 trn m$^3$
- **Germany**: 2.83 trn m$^3$
- **Britain**: 2.83 trn m$^3$

Sources: IEA; APPEA

CBM drainage and utilization amount in recent years of China (100 million m$^3$)

<table>
<thead>
<tr>
<th>Year</th>
<th>Drainage</th>
<th>Utilization</th>
<th>Drainage</th>
<th>Utilization</th>
<th>Drainage</th>
<th>Utilization</th>
<th>Utilization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>133</td>
<td>45</td>
<td>37</td>
<td>32</td>
<td>170</td>
<td>77</td>
<td>45%</td>
</tr>
<tr>
<td>2015</td>
<td>136</td>
<td>48</td>
<td>44</td>
<td>38</td>
<td>180</td>
<td>86</td>
<td>48%</td>
</tr>
<tr>
<td>2016</td>
<td>128</td>
<td>48</td>
<td>45</td>
<td>42</td>
<td>173</td>
<td>90</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: BP energy statistics yearbook 2018
Basic introduction of ICE-CMM

Council members

- Shanxi Coking coal Group Co., Ltd
- Yangquan Coal Industry (Group) Co., Ltd
- Shanxi Lu’an Mining (Group) Co., Ltd
- Beijing Sindicatum Clean Energy Technology and Services Co., Ltd
- Taiyuan Kuangji Electrical Co., Ltd
- Beijing Yonder Environment Science Company Limited by Shares
- Nanjing Carbon Recycle Biomass Technology Co., Ltd
- Fortman (Beijing) Clean Energy Technology Co., Ltd
- Shanxi Wenlong Zhongmei Environment & Energy Technology Co., Ltd
- Shanxi Gowin CBM Comprehensive Utilization Engineering Technology Company Limited by Shares

Business platform

- UN methane drainage and utilization new concept, industry standard formulation (identification), industry policy advocacy, international standard promotion platform
- Comprehensive service platform for capital, scientific research, talents, information resource sharing, engineering practice and technical training of methane drainage and utilization
- Methane utilization and carbon finance business mode linkage platform, related equipment manufacturing and development platform
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02 Completed work of ICE-CMM in 2018

1. Guidance to ICE-CMM in China

Action 1: Jan 16\textsuperscript{th} – 18\textsuperscript{th} 2018
GMI provided working guidance to ICM-CMM and SCCG, and selected Tenghui Coal Industry as the CMM FSR project.

Action 2: Jun 3\textsuperscript{rd} – 6\textsuperscript{th} 2018
Ms. Felicia A Ruiz, Mr. David Creedy and Mr. Clark Talkington inspected the underground methane drainage system of Tenghui Coal Industry.
1. Guidance to ICE-CMM of China

Action 3: Aug 30\textsuperscript{th} 2018
GMI inspected Duerping CMM Plant

Action 4: Sep 11\textsuperscript{th} 2018
The President, Mr. Raymond C. Pilcher guided the work of ICE-CMM of China

Action 5: Oct 9\textsuperscript{th} – 10\textsuperscript{th} 2018
The 3\textsuperscript{rd} phase filed work will be held

Completed work of ICE-CMM in 2018
Promote the construction of phase 3 of Xishan Coal Electricity Group’s Tunlan CMM project, with an installed capacity of 4MW, which has been officially put into operation on May 20th.

Promote the construction of Yangquan Coal Industry’s No.2 mine Sangzhang VAM power generation project, which is expected to generate power and heat in November 2018.

The technology research project of multi-branch horizontal drilling docking and underground methane drainage project was applied in Shaqu No.1 mine of Huajin Coking Coal Group, while phase 1 has been completed.

The research of methane drainage drilling project in coal seal (caliber above 100mm, depth above 100m) was applied in Zhongxing mine of Fenxi Coal Industry.
GMI supported the capacity building of ICM-CMM and cultivated the teachers of Best Practice, while the technical training was launched in June 2018 in Hejin, Shanxi.

With a wide impact range, the training has been reported by the mainstream media including Xinhua Network, People’s Network, Coal Network and Yellow River Network. UN’s news network reproduced Jun 8th’s news of People’s Network and carried out relevant reports.
The 2nd session of Best Practice training was held in August 2018 in Taiyuan, Shanxi. 61 trainees in total accepted the training. 3T risk assessment method and “Elmeri” tool have been applied in the ventilation management practice of SCCG with a good effect.
China ICE-CMM actively promoted the need to adopt best practice following meetings between Shanxi Xishan Mining Management Co., Ltd and Georgian Industrial Group on Mindeli colliery of Tkibuli.

A continuing role of ICE-CMM will be to ensure that in both national and international mining and CMM activities involving SCCG, or any other ICE member mining groups, the principles of Best Practice Guidance on CMM will be adopted and implemented.
5. Academic exchanges and academic activities

Nov 30th 2017
The Chairman Jin Zhixin attended 2017 U.S.-China Clean Coal Development Forum organized by the National Energy Administration of China and the Department of Energy of the United States, and delivered a theme speech.

April 2018
ICE-CMM dispatched the representatives to 2018 Global Methane Forum held in Toronto.

Jun 19th-22nd 2018
ICE-CMM dispatched the representatives to the 25th World Mining Congress held in Astana.

Completed work of ICE-CMM in 2018

02
5. Academic exchanges and academic activities

Aug 8th 2018
Mr. Jin Zhixin participated in the symposium on coal safety intelligent precision mining collaborative innovation sponsored by the Chinese Academy of engineering.

Sep 6th 2018
Mr. Jin Zhixin participated in the defense evaluation of China Coal Industry Association's science and technology award.

Sep 12th 2018
ICE-CMM invited the President, Mr. Raymond Pilcher to attend 2018 Shanxi Foreign Experts Project Cooperation Forum and delivered a theme speech.

Oct 13th 2018
The Chinese Academy of Engineering held the Energy Science and Technology Forum in Taiyuan and ICE-CMM participated in the related events of the forum as a voluntary organization.
6. The promotion of various affairs

- Promote the registration of ICE-CMM
- Speed up the translation and publication of the Best Practice
- Actively establish an information sharing platform

The registration of ICE-CMM has been preliminarily approved, which is expected to be completed by the end of 2018.

The first draft of the Chinese version of the *Best Practice Guidance for Effective Methane Drainage and Use in Coal Mine* has been completed, and a publication licensing agreement has been signed with the United Nations Publishing Office. It is expected to be published by the end of 2018.

The intelligent management platform for methane drainage and utilization developed by Beijing Sindicatum Company, a council member of ICE-CMM, has been initially completed and is expected to be fully completed by 2018.
Introduction of ICE-CMM in China

Completed work of ICE-CMM in 2018

Workplan of ICE-CMM for 2019

Concluding remarks
1. The promotion of new technologies

Development of precise and intelligent anti permeability technology for coal seam -- low permeability coal seam

Huajin Coking Coal Co., Ltd cooperated with Xi’an Jiaotong University to carry out the test of precise and intelligent anti permeability technology for coal seam in Jining mine.

--By searching for controllable shock wave to disturb coal seam and open the micron cracks, the permeability can be increased and the efficiency of methane drainage can be improved.

Development of ultra-low concentration methane utilization technology

Assist the council members of ICE-CMM in developing the ultra-low concentration methane catalytic oxidation technology for non-noble metals.

--The technology has the characteristics of non-noble metal catalysis and thermal oxidation device without producing nitrogen oxides.
2. The development of demonstration projects

- **The development of demonstration project of ultra-low concentration methane oxidation combined heat and power production in Lu’an ancient city**

  Guide the development and construction of the demonstration project of combined heat and power production with VMA thermal oxidation power generation, waste heat recovery and utilization, no nitrogen oxide in Lu’an ancient city

- **The development of Tenghui methane drainage and utilization demonstration project**

  Guide Huozhou Coal Electricity Group Co., Ltd to develop the methane utilization project of Tenghui Coal Industry
3. The research of basic theories

Together with Taiyuan University of Technology, China University of Mining and Technology and University of Wollongong in Australia, the National Key Laboratory of Mine Intelligent Ventilation and Methane Green Utilization was established to carry out basic theory and engineering research on methane drainage and utilization.

4. Academic forums and academic activities

Organize and participate in academic forums on mining and methane utilization and conduct academic exchanges and working visits with the National University of St. Petersburg, the Imperial University of Technology and ICE-CMM in Poland.
5. The promotion of industrial and financial integration

ICE-CMM will guide Shanxi Coking Coal Finance Holding Company and the relevant financial institutions to jointly set up a methane industry development fund to provide market-oriented financial supports for the development and construction of methane drainage and utilization projects and equipment manufacturing.

6. The promotion of Best Practice

- Taking the publication of Best Practice’s translation version as an opportunity, expand the influence of Best Practice
- Taking the technical training of Tenghui methane project as a demonstration, hold the technical training of Best Practice
- In cooperation with universities and research institutes, hold academic forums on CMM
ICE-CMM will strive to establish strategic partnerships with 3-5 methane companies, research institutes, universities and industry associations to form the support force of ICE-CMM.

ICE-CMM will continue to actively guide and serve the cooperation between Shanxi Xishan Mining Management Co., Ltd and the Georgian Industrial Group.

ICE-CMM will be guided by UNECE and its GoE on CMM, support their work, attend the relevant meetings and report to the GoE on CMM.
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Care for the growth
Support the development
Agglomerate the wisdom
Share the platform

Control the methane, for a safer coal mine
Utilize the methane, for a greater efficiency
Reduce the methane emission, for a more suitable climate
THANK YOU FOR YOUR ATTENTION