

Focusing on the global methane management

Action now by all and for all



中國工程院

Chinese Academy of Engineering



ICE-CMM
卓越瓦斯



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Academician

ICE-CMM in China

Chairman

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General Manager

Key Point



- **Coal and Human being**
- **ICE-CMM in China**
- **Practice in ShanXi Coking Coal**
- **Challenges and Considerations**

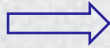
● Coal and Human being



1.The evolution in history

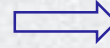
7200 years ago

Neolithic Age
Liaoning China
Goods



3500 years ago

Bronze Age
Xin Jiang
for burning



1800years ago

<Notes on
Book of
Water>



By the end of
18th century
Industry
revolution



Coal and Human being



2. Important role , in the development of human society

- **Proportion of Primary Energy Consumption 28.1% globe**

(source : 2017 《Bp world energy statistic》)

- **Proportion in China 61.8% , 2016**

(source : 2017 《Bp world energy statistic》)

- **75blt coal produced in the past 60 years**

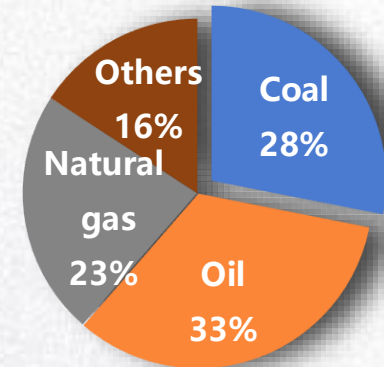
(source : 2017international energy expo. in china)

- **9blt coal production estimated globally in 2020**

(source : (IEA) 2014 《 coal market biannual report 》)

- **Proportion of PPEC 50%+ china in 2035**

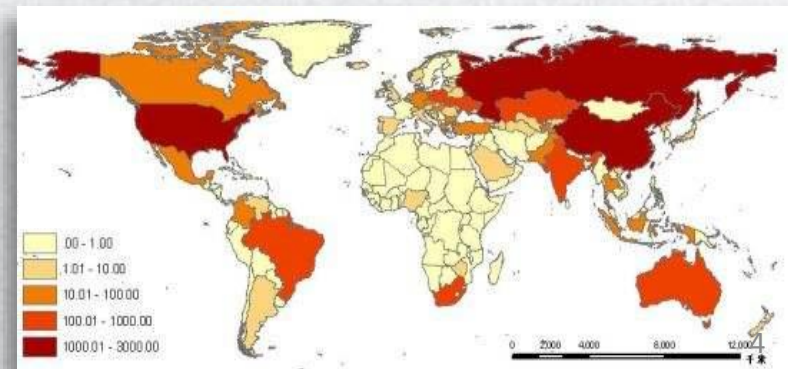
(source : China development Summit 2014)



GLOBAL PRIMARY ENERGY CONSUMPTION STRUCTURE 2016



Coal resource locations in China

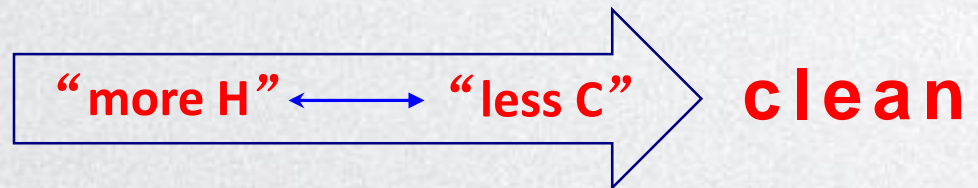
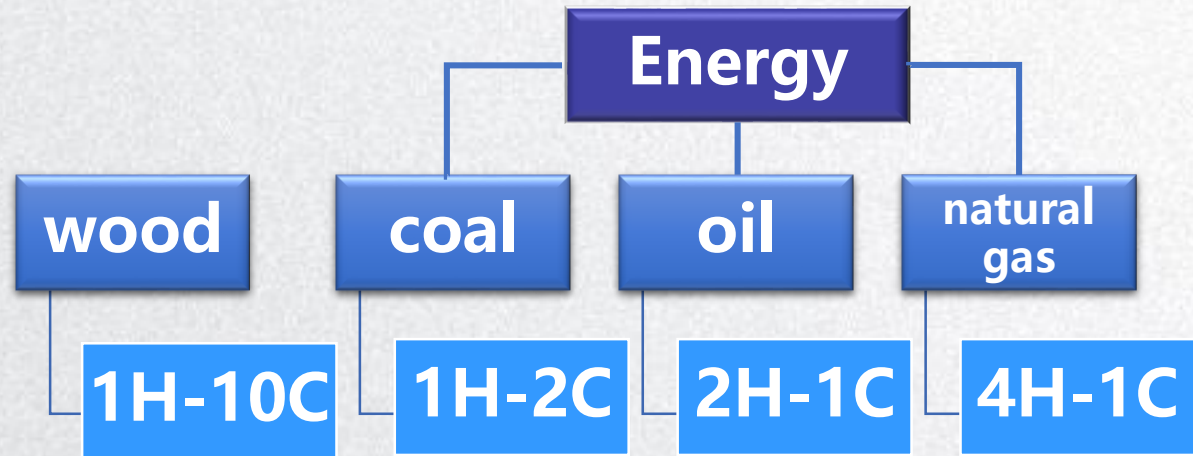


Coal resource locations in the world

● Coal and Human being ● ● ● ●



3. Energy consumption evolution from ancient —more H and less C



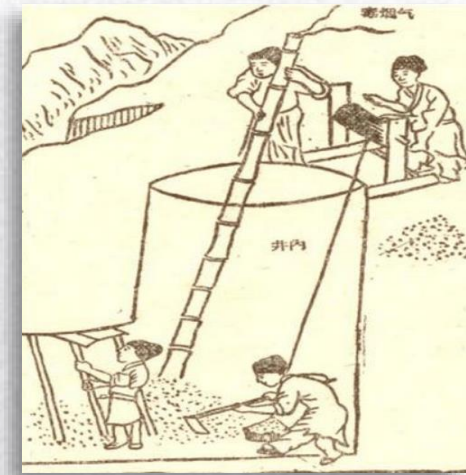
● Coal and Human being ● ● ● ●



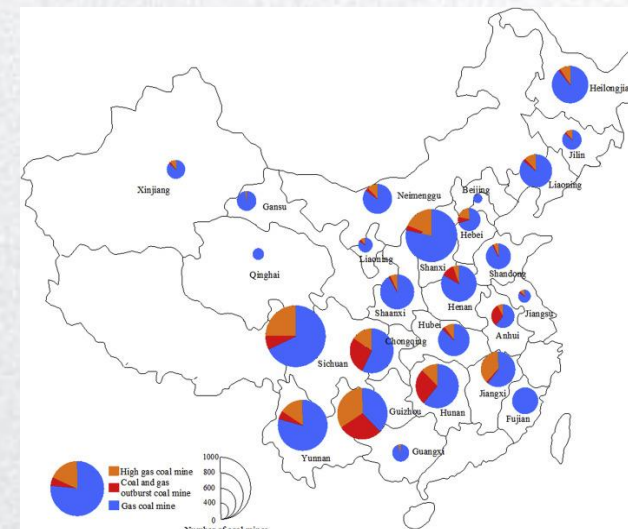
4. Coal and gas formed and reserved together

- Adsorbed on the surface of coal particles , partly dispersed in coal pores or dissolved in coal seam water. It is an mineral resource of coal and belongs to unconventional natural gas
- Coal and gas are associated with each other, and coal mining accompanied by large amount of gas emission
- Note in Ming dynasty: realized the toxicity of gas
- In 2015, 18 billion Nm³ produced, 8.6 billion Nm³ used in China (source : national energy bureau)
- Forecast: 90 billion Nm³ CMM production in 2030

(source : 《 Forecast and analysis of CBM market trends and future trends in China 2014-2019》)



《Techart Group》



Coalmines' s location with gas and gas outburst in China

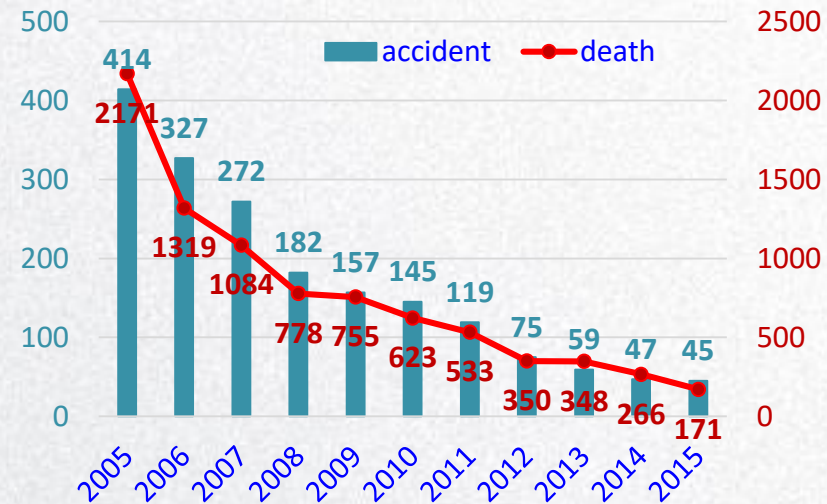
Coal and Human being



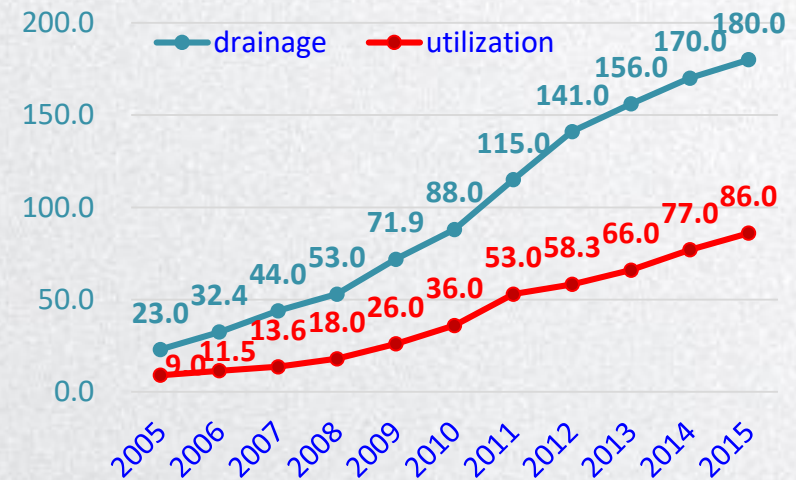
5. Three stages for Human being knew gas

- Initia
- Harmful gas
- No.1 killer for coal mines

- Development
- Gas, A kind of Clean energy
- Green house effect
21 times of CO₂
- Coal and gas co-mining theory
(Academician Yuan Liang)



gas accidents and deaths in China



statistic for drainage and utilization

Coal and Human being

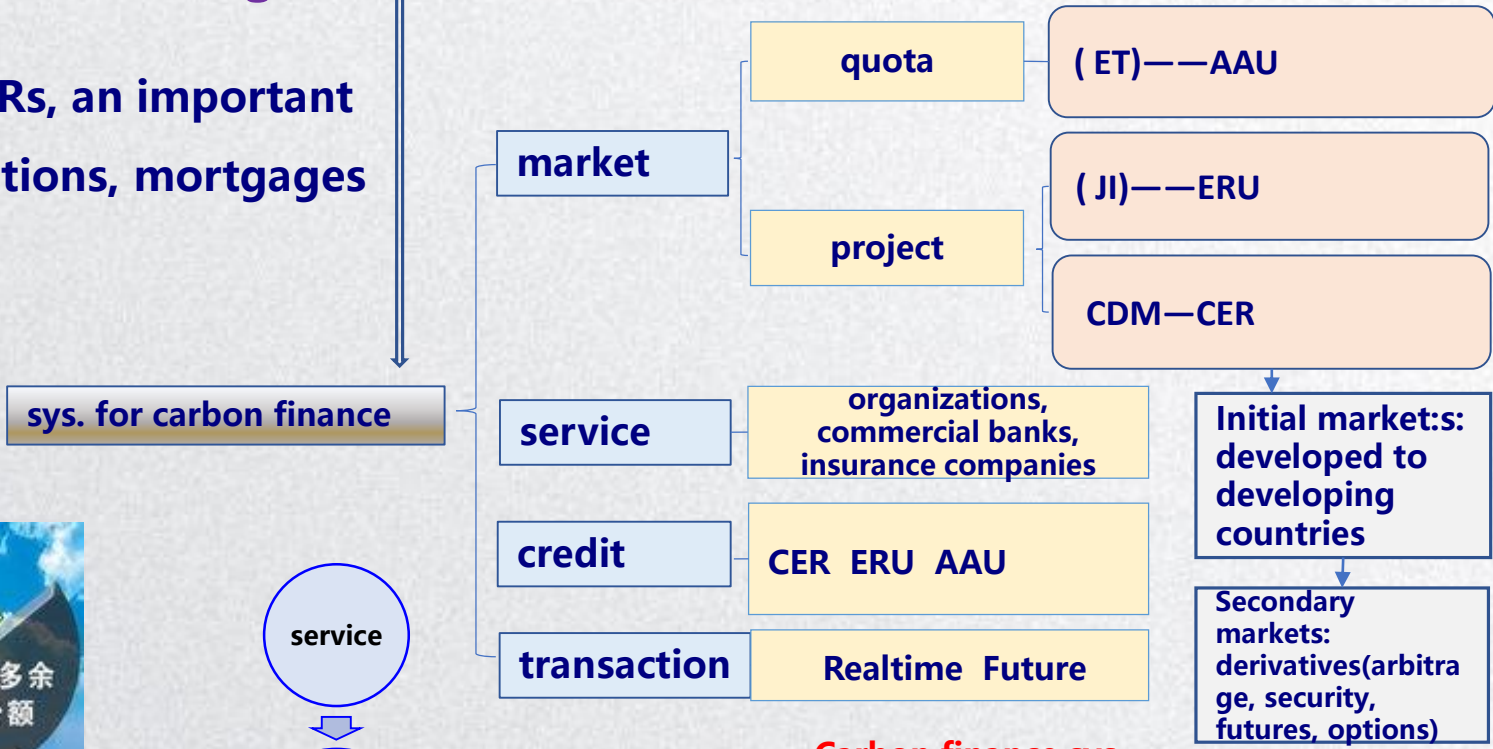


5. three stages for Human being knew gas

Capitalization stage

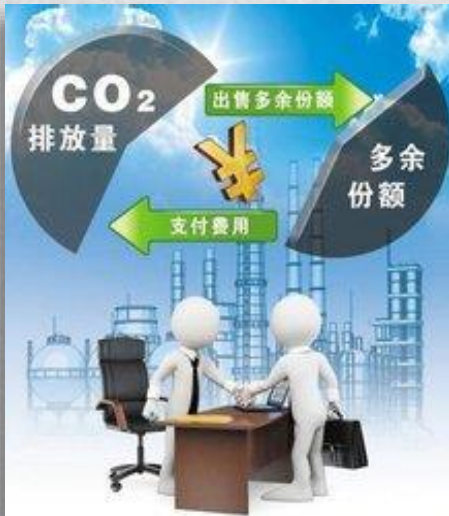
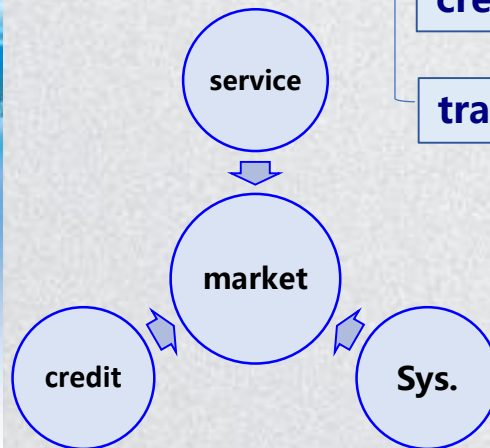
Gas produce CERs, an important asset for transactions, mortgages and financing.

origin : UNFCCC (1992) - 《 Kyoto Protocol 》 (1997)



Carbon finance sys.

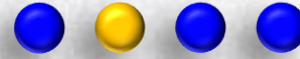
The capitalization of gas utilization is another great progress from the industrial civilization characterized by fossil fuels to the ecological and economic civilization.



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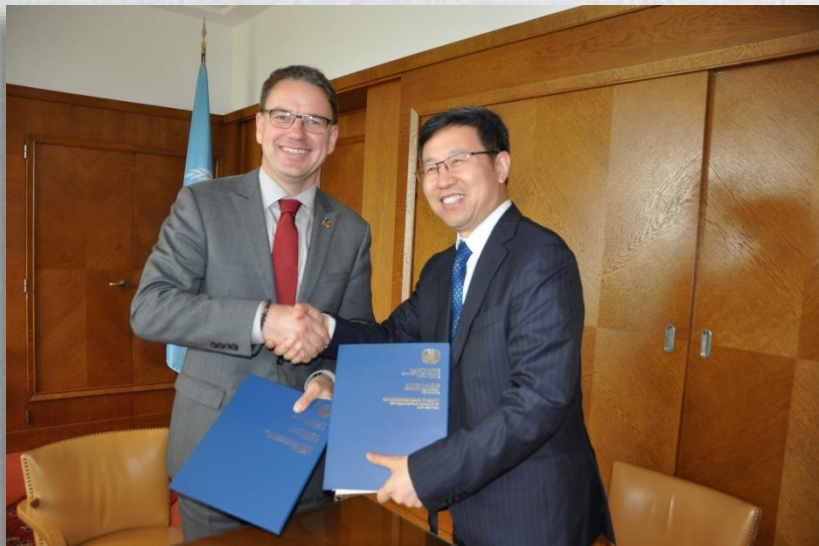


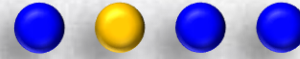


1. Goals and Tasks

ICE-CMM in China, under the authorization of the UNECE, based on Shanxi Coking coal. The only global methane management hub for coal mines.

Committed to the global CBM(CMM) promotion of drainage, utilization and new technologies; committed to clean energy utilization, greenhouse gas emission reduction.



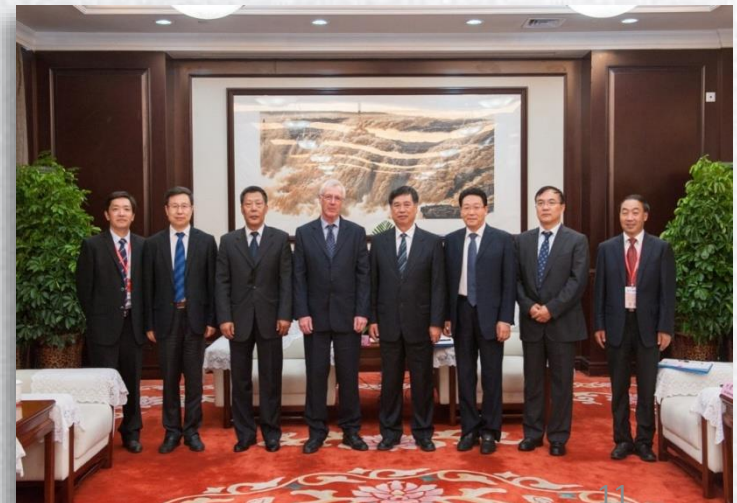


2. Background

● Channel to Guarantee International cooperation

UNECE promotes the effective implementation of the guidelines for extraction and utilization of CMM(2011, 222 Act) to carry out methane management worldwide.

Cooperation between the two sides unprecedentedly open up a channel for policy makers to directly contact interested parties.



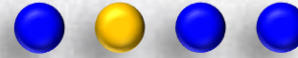


2. Background

- The state provides solid policy guarantee
 - State basic policy: Resource saving and environment protection
 - G20 summit 2016, Xi Jin ping and UN former general-secretary Banki-moon



- Subsidy by central gov. 0.3rmb/ m³ , by Shanxi province another 0.1rmb/m³
- Full coverage of coal mine gas extraction and utilization project. Forecast: 11.3bNm³ CMM are to be drained, 6.5bNm³ to be used in 2017



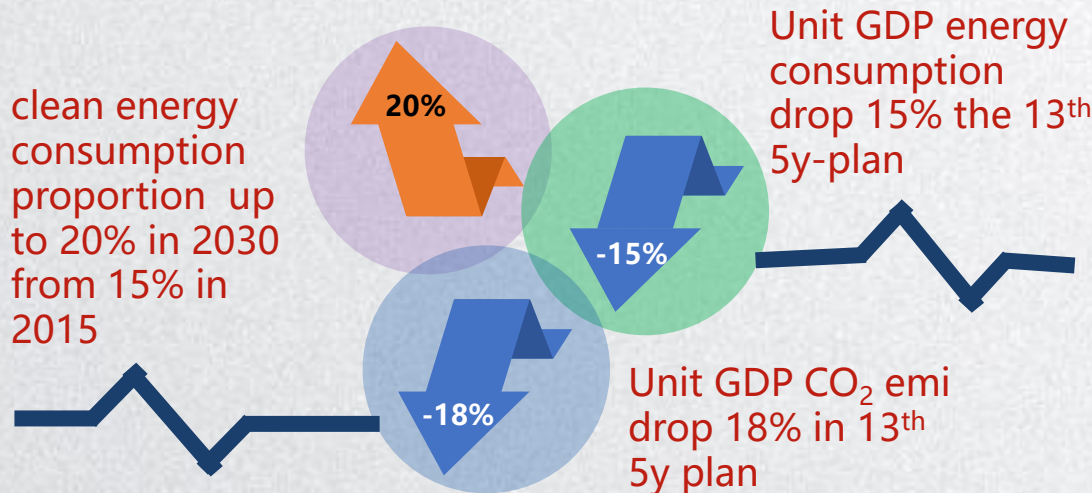
2. Background

- China's carbon emission reduction is a key contribution to the world

China is the largest developing country in the world and one of the world's major carbon emitters. China's greenhouse gas emission reduction itself is a contribution to the world .

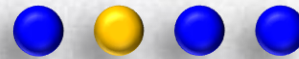
Innovation, coordination, green, open and shared development.

China will move towards ecological civilization.



Commitment and confidence. China is a responsible developing country and a positive force in Global Climate Governance

(source : 《"13th Five-Year" plan》)



2. Background

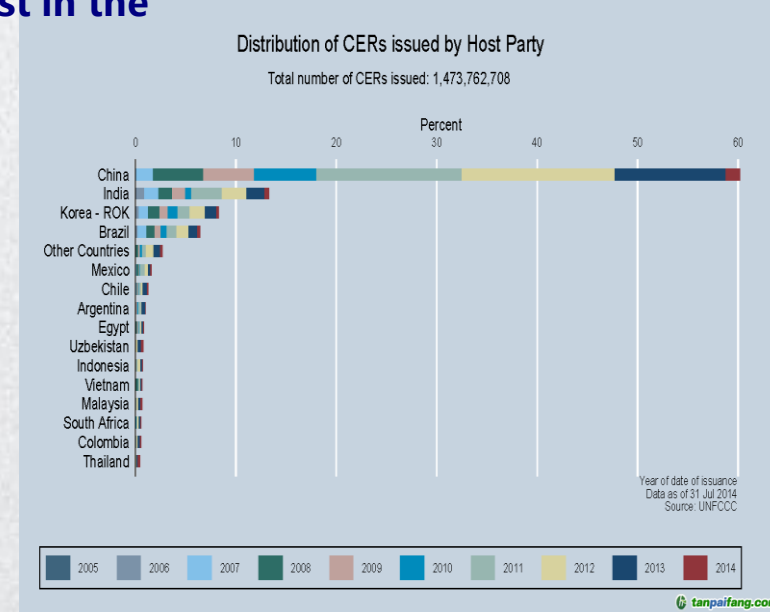
● Guarantee for Carbon finance market demand

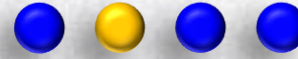
- By 2020, the global total carbon emissions trading is expected to reach 3.5trillion\$
- Carbon transaction is to replace oil be No.1
- China has taken the lead in global CDM Market Since 2009

Number of project, expected emission reductions and CERs issued by EB have being ranked first in the world

- Carbon emissions trading in 7 provinces and cities. China's carbon emissions trading (CCER) has entered the "fast lane " since 2013

- The world's carbon trading market is inseparable from China's extensive participation, and China's carbon trading also needs a prosperous world carbon market environment





3. Three major functions

1

Promoting new technologies on CMM extraction and utilization , project guidance, industry standards formulation (recognition), industrial policy advocacy.

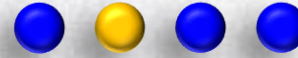
2

Assisting enterprises, universities, research institutes to cooperate in technology, research and project .

3

Assisting and Guiding enterprises with “The Belt and Road” in mining, coal processing, coal chemical, equipment, gas utilization.





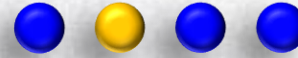
4. Three major platforms

● Constructing three service platforms

Based on the Support from governments at all levels in China

Under the guidance of UNECE





5. Three major obligations

- Support the Chinese government's carbon emission reduction commitments
- Assist Carbon emission reduction for UN member countries
- Joint effort to protect the homeland of human being



So vulnerable the earth is as it is so valuable.

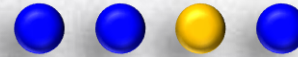
The climate has been and will continue to be the world's largest public product for all.

ICE-CMM in China, we are coming today.

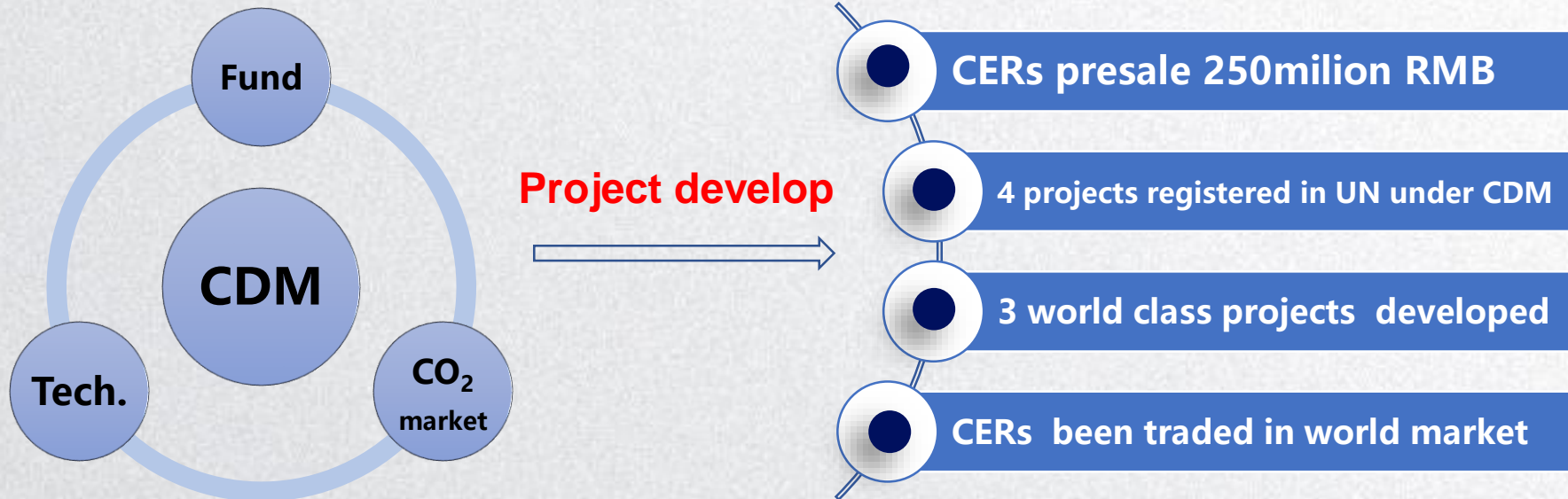
Key Point



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- challenges and Considerations



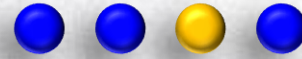
1.The "3+1"model (TCF + CDM)



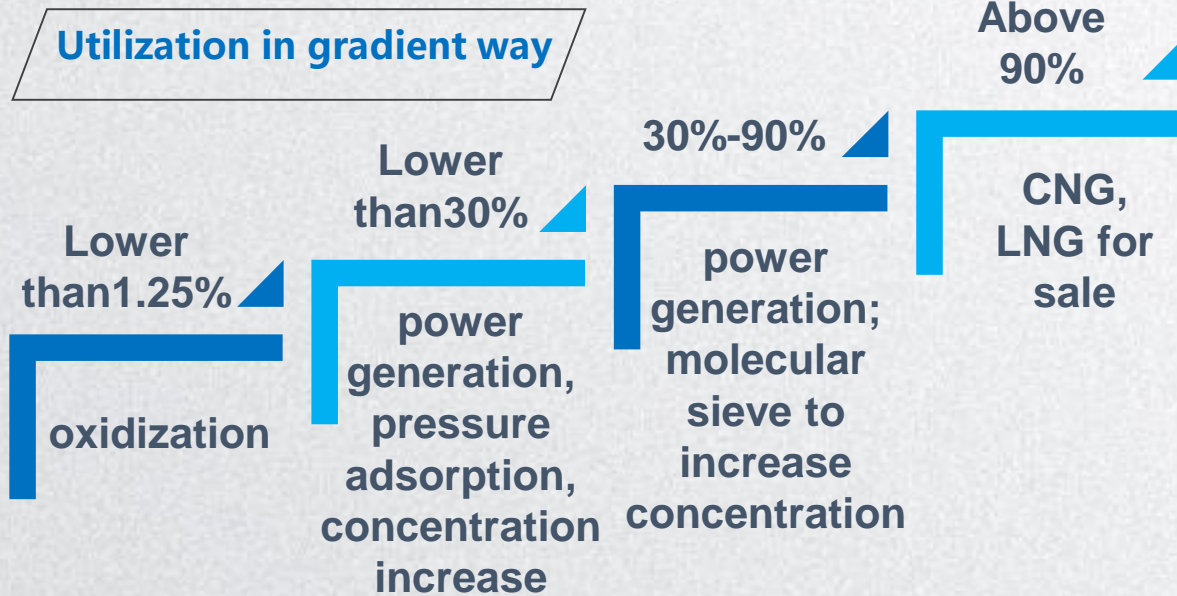
- 17 projects built, utilization 169MNm³/y , CO₂ reduction 2.5Mt.
- 4 power stations with High concentration gas. 4 with low concentration, total installed capacity 123.32Mw.



"SCCG Model" sharing



2. The "3and1"(3products and 1destruction)



Compression station



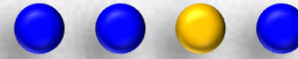
Oxidization for VAM



Generators



Pipeline transportation

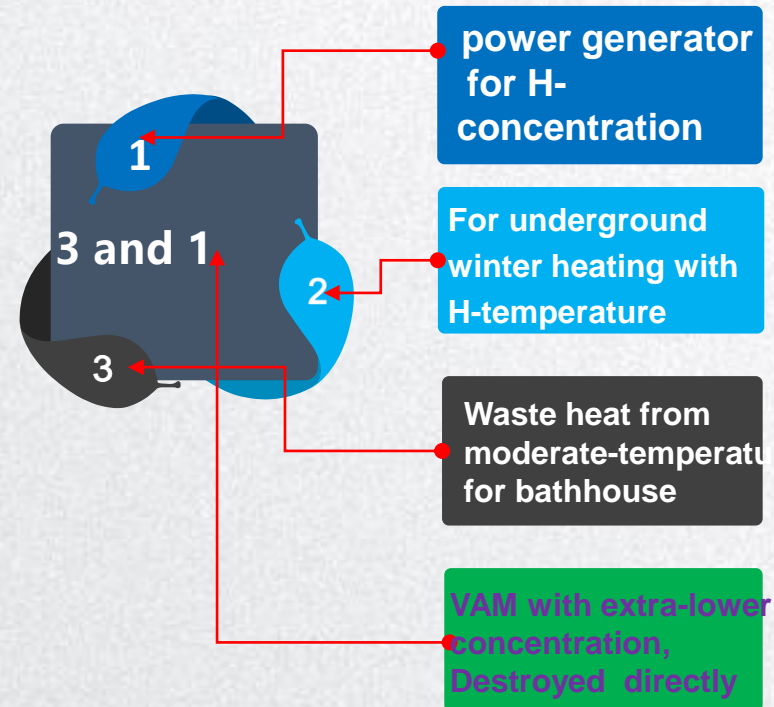


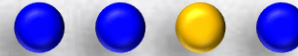
2. The “3and1”(3products and 1destruction)



Du'erping demonstration project cooperate with Cindicatum, the introduction of international technical team and advanced technology, concentration increased from 15 to 33%, laid the foundation for the subsequent use of high quality gas. Form the virtuous cycle of utilization to promote drainage, drainage to ensure safety.

★ **Concentration is not problem, but the drainage is**

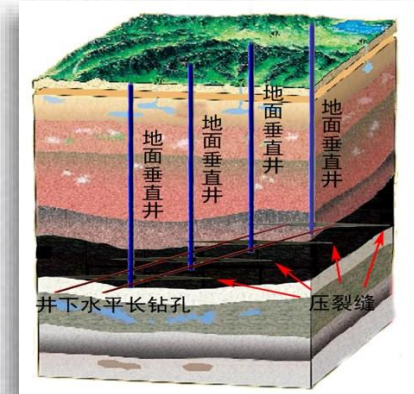




3. Dimensional drainage

3.1. terms and spaces

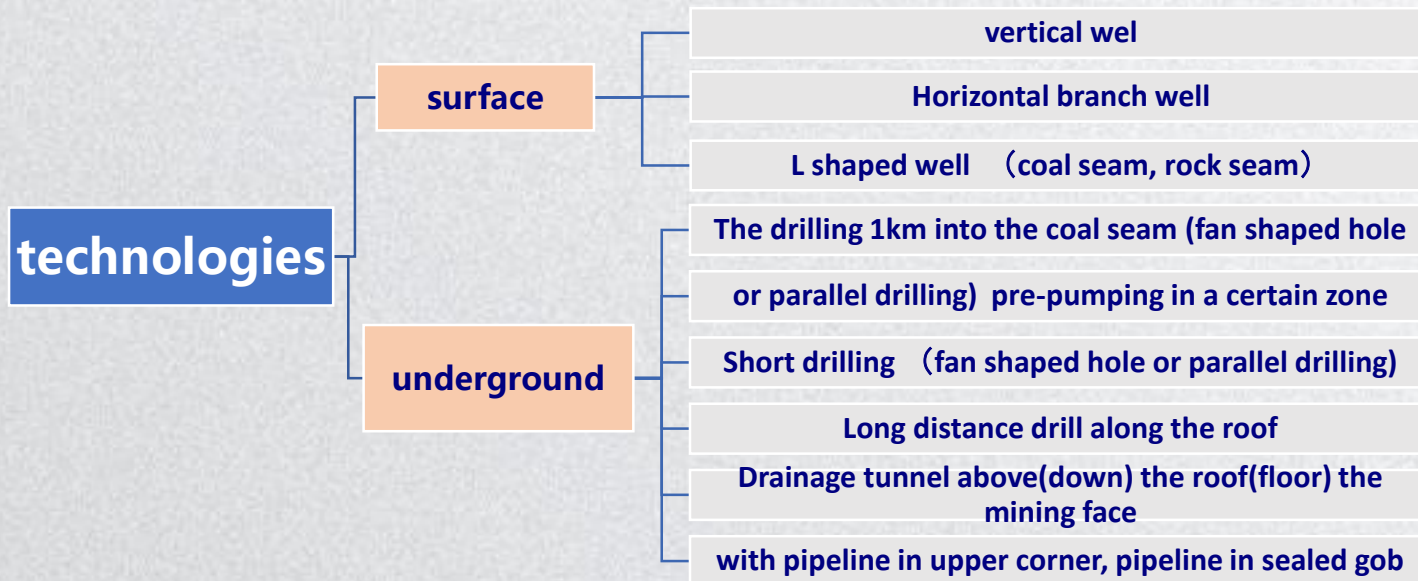
To drainage in all terms and multi-dimensions



terms

dimension

3.2. application of comprehensive tech.





3. Dimensional drainage

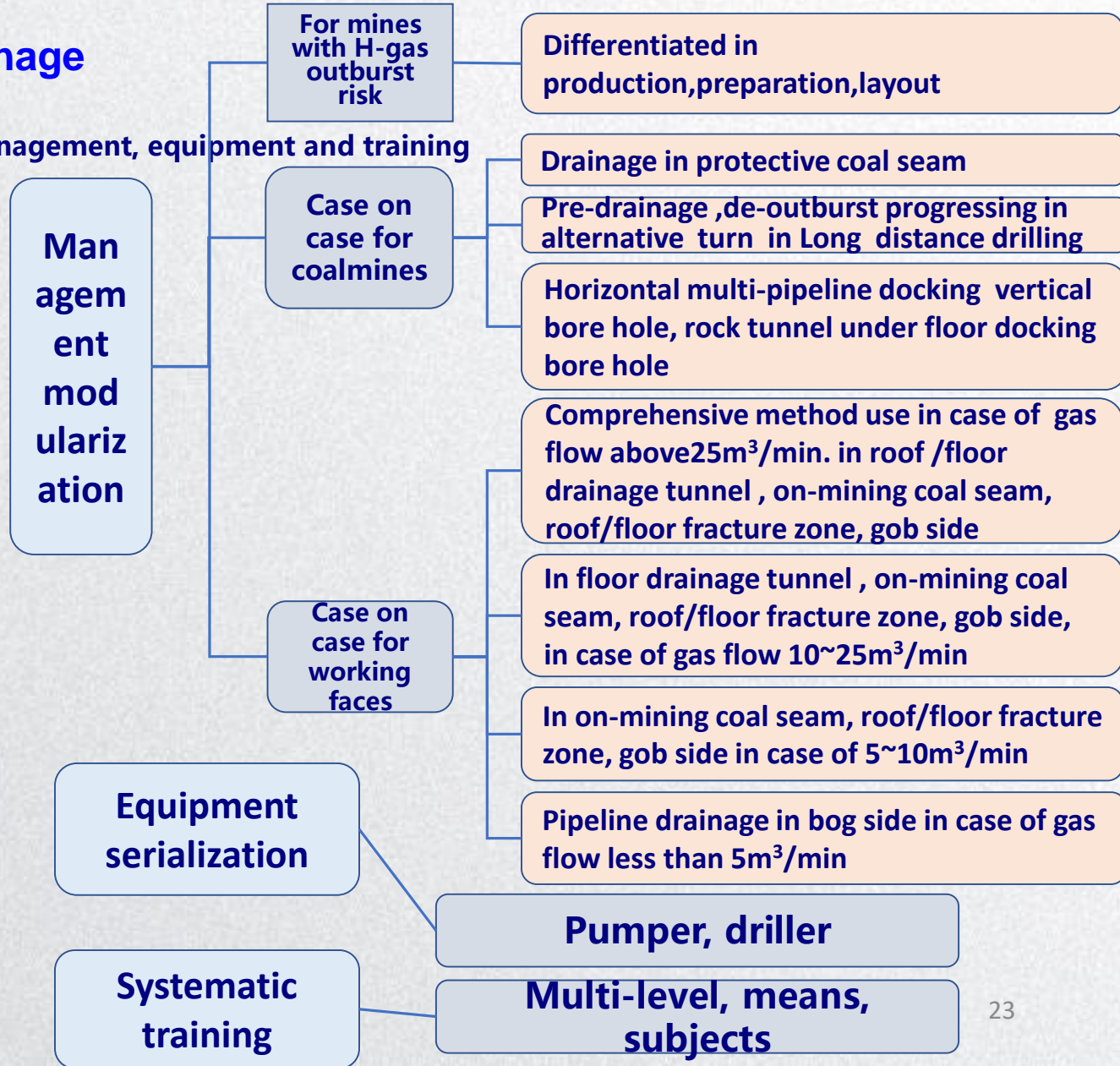
3.3. diversification in Management, equipment and training

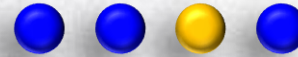


ZDY armored driller



2BEC pumper





4. Taking "carbon" as the intermediary, connecting industries with finance agency

SCCG registered “Carbon Asset Management Company” at the end of 2015. The formation of “Carbon Asset” company is of helpful for “Carbon” to mortgage loans, bond issuance. The equity and investment platform creating a history for China’s coal enterprises to enter the field of carbon finance.

碳市场交易



2 CCER projects in SCCG
have been registered

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1. Utilization for VAM

A large amount of VAM concentration in China are around 0.1%, which is not matched with the existing equipment (0.4-1.25 required) for utilization



VAM oxidization

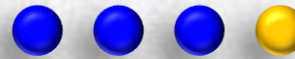
2. Drainage in Goaf and abandoned zone

The drainage in goaf is prone to increase air leakage, cause spontaneous combustion.

Gas drainage and utilization in abandoned mine need more policy support.



Abandoned coalmine



3. The gas capture and utilization in open mines

A large amount of VAM concentration in China are around 0.1%, which is not matched with the existing equipment (0.4-1.25 required) for utilization.



Open mine

4. Drainage efficiency under special geological conditions

Low drainage efficiency due hole collapse under condition of Broken and Soft coal (rock) seam. The low drainage efficiency impacted by aquifer.

5. The incentive policy for emission reduction Innovation needed in financing model for projects

Strong incentive policy for emission reduction and use needed under the principle of "extra " for each Government. Special support for high quality gas utilization(tax,price,etc.) expand carbon financing channels.



● consideration

Utilization rate around 40% in china, means more space to improve, " The center " guides the best practice and is ready to work with you hand in hand to face the challenges in tech., finance, and equip.

Central government published "long term mechanism on resource capacity and monitoring early warning system" ,environment cost will enter into energy pricing, indicate both opportunities and challenges.



**Caring supporting focusing
sharing**

**well managed gas making the coal mines
safer**

**well gas utilization making benefits
maximization**

**Less emission for better
Life**





**T H A N K
Y O U
FOR YOUR
ATTENTIO
N**