



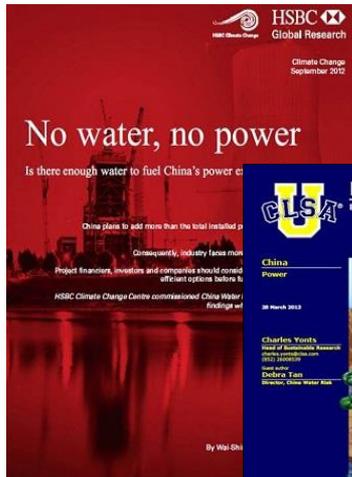
# CHINA WATER RISK

**More GDP with less water and pollution**

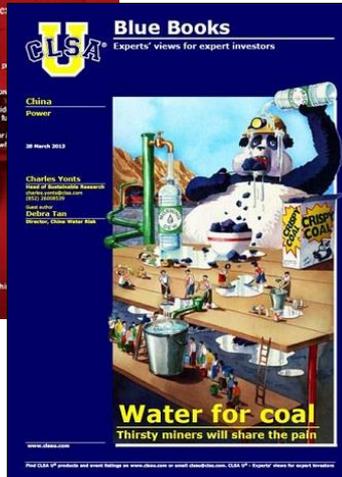
29 August 2018

**Micro-level water-nomics: evaluating sectoral water risks**

# Mainstreaming water as a financial risk ...



2012



2013

*"We off-loaded our entire coal portfolio after sitting down with you"*

European fund

*"...when at HSBC, the no water, no power report was one of our signature pieces."*

Nick Robins, Co-Director, UNEP Inquiry

2014

Keynote & panelist alongside water laureates

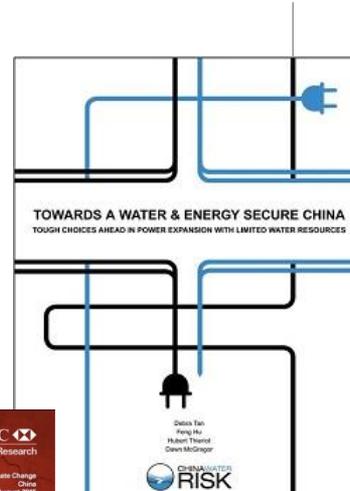


2015



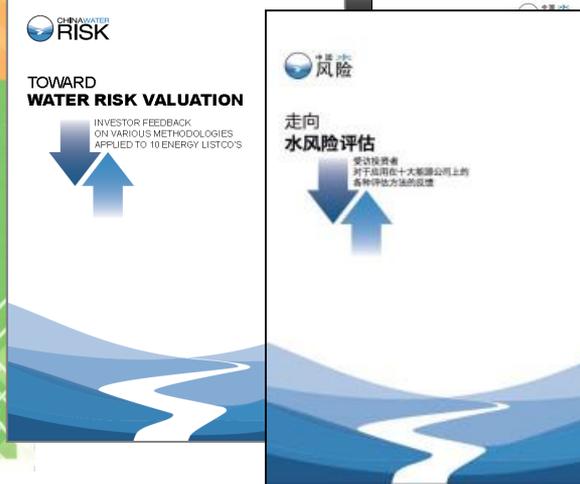
Using WEN to start a water-nomics conversation in finance & policymaking

Recognition by the Water International Journal



2016

Global policy arena with IRENA & Rare Earths



# Macro & micro perspectives ...

**WATER-NOMICS OF THE YANGTZE RIVER ECONOMIC BELT**  
 Strategies & recommendations for green development along the river

Foreign Economic Cooperation Office,  
 the Ministry of Environmental Protection of the People's Republic of China  
 China Water Risk

June 2016




**ITP WATER RISK ASSESSMENT**

August 2013

International Tourism Partnership 

By Kyungmee Kim, Andreas Lindström and Josh Weinberg

**EVALUATION**  
 FEEDBACK  
 METHODOLOGIES  
 AND ENERGY LISTCO'S

**China task force on ERA**

  
 中国金融学会绿色金融专业委员会  
 Green Finance Committee, China Society for Finance and Banking

**ICBC**  **中国工商银行**  
 INDUSTRIAL AND COMMERCIAL BANK OF CHINA

 **中国人民银行**  
 THE PEOPLE'S BANK OF CHINA

# Water risk for power sector...

**3**   
**WATER RISK VALUATION  
 APPROACHES**

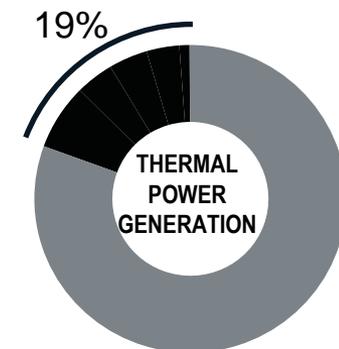
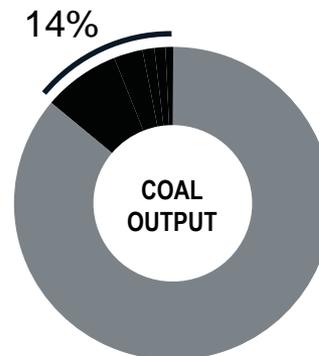
1. SHADOW PRICING
2. EXPOSURE TO WATER STRESS
3. REGULATORY RISKS

**10**   
**ENERGY LISTCO'S**

**COAL-5**  
 SHENHUA ENERGY  
 CHINA COAL  
 YANZHOU COAL  
 INNER MONGOLIA YITAI COAL  
 DATONG COAL

**POWER-5**  
 HUANENG POWER INTL  
 DATANG INTL POWER  
 GUODIAN POWER DEV  
 HUADIAN POWER INTL  
 CHINA POWER INTL

**>70**  
**INVESTMENT  
 PROFESSIONALS  
 FROM ~50 INSTITUTIONS**



# Investors say they are worried about risk ...

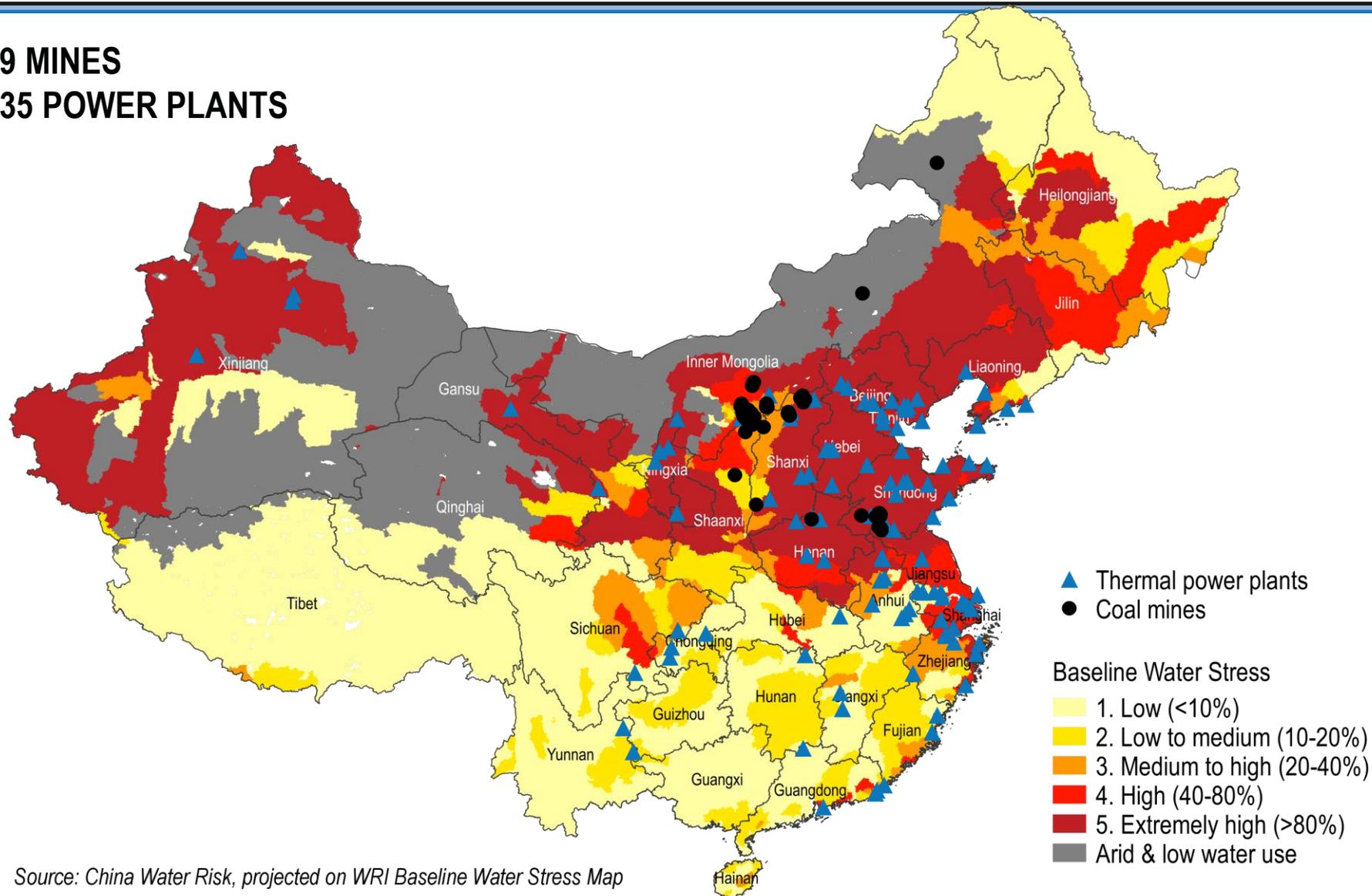
## Before we start, why are you doing the survey?



*Note: multiple choices possible*

# 1- Exposure to water stress

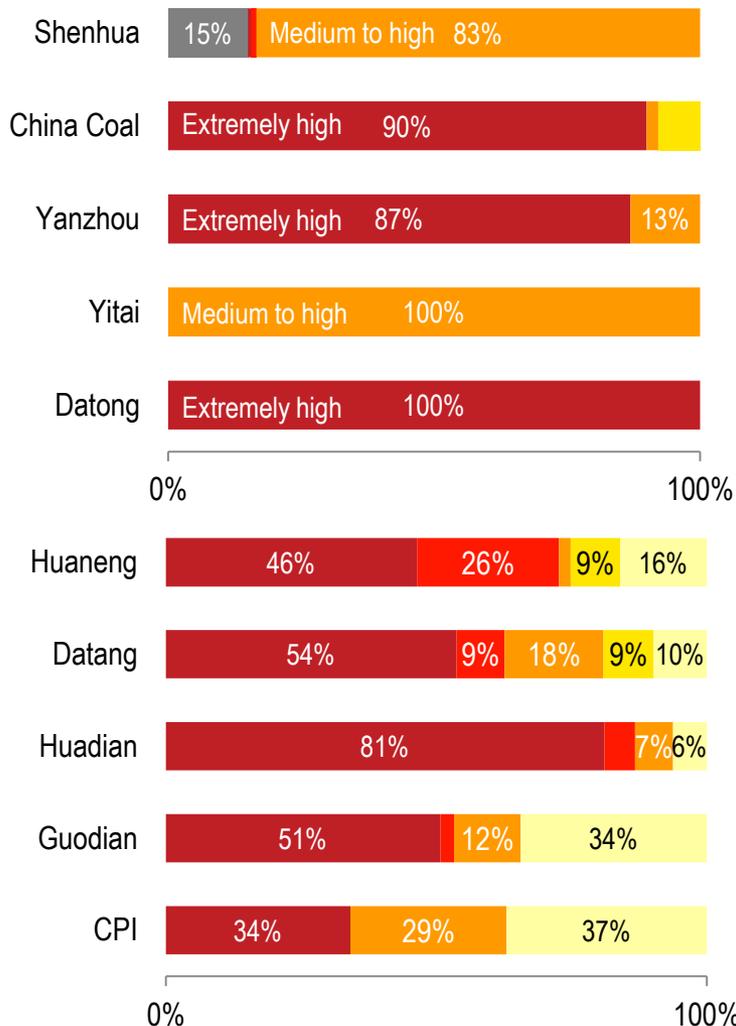
**79 MINES**  
**135 POWER PLANTS**



Source: China Water Risk, projected on WRI Baseline Water Stress Map

# 1- Exposure to water stress

## GLOBAL MAP

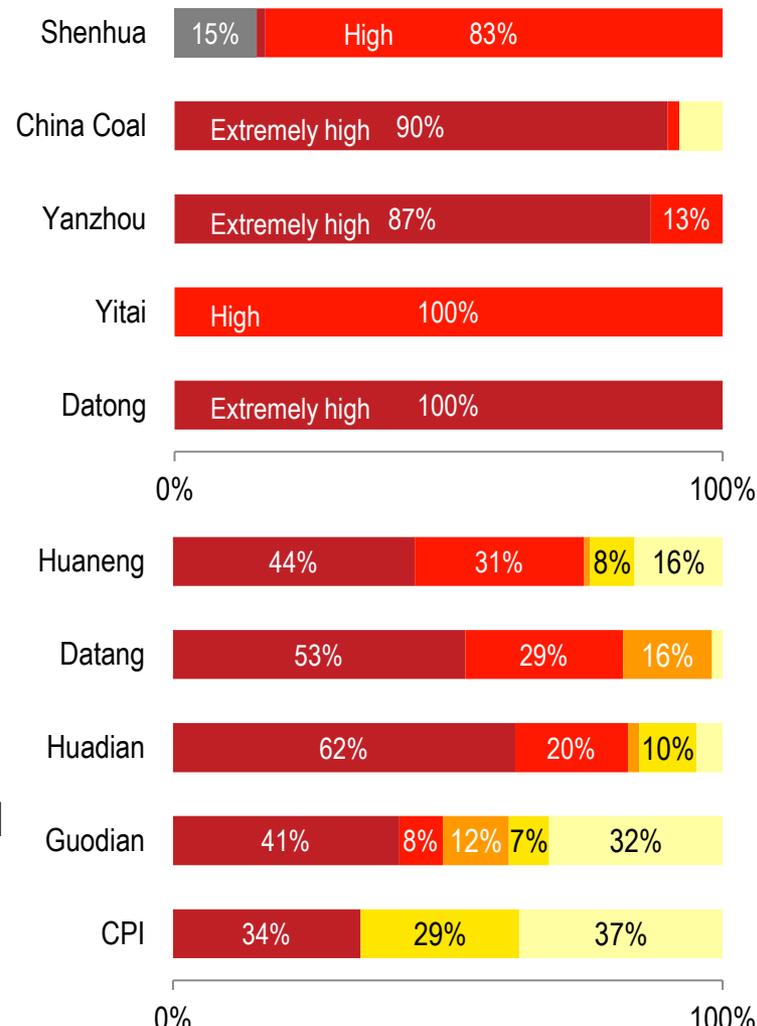



### COAL-5 OUTPUT



### POWER-5 GENERATION

## CHINA MAP

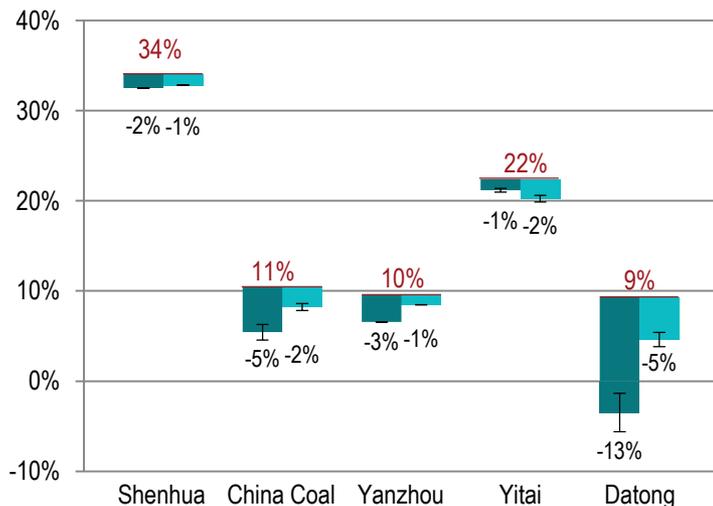


## 2. Shadow pricing



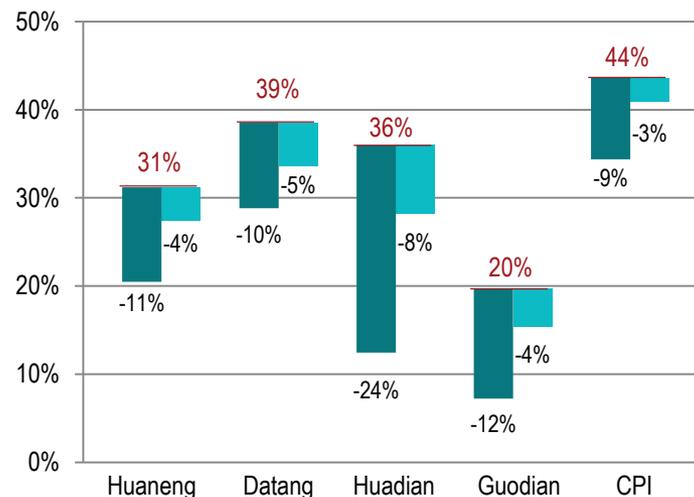
### COAL-5

EBITDA / Revenue



### POWER-5

EBITDA / Revenue



Current EBITDA/Revenue  
 Tool #2 WRM  
 Tool #1 CBWCRT  
 Potential loss of profitability due to water risks

### 3 observations

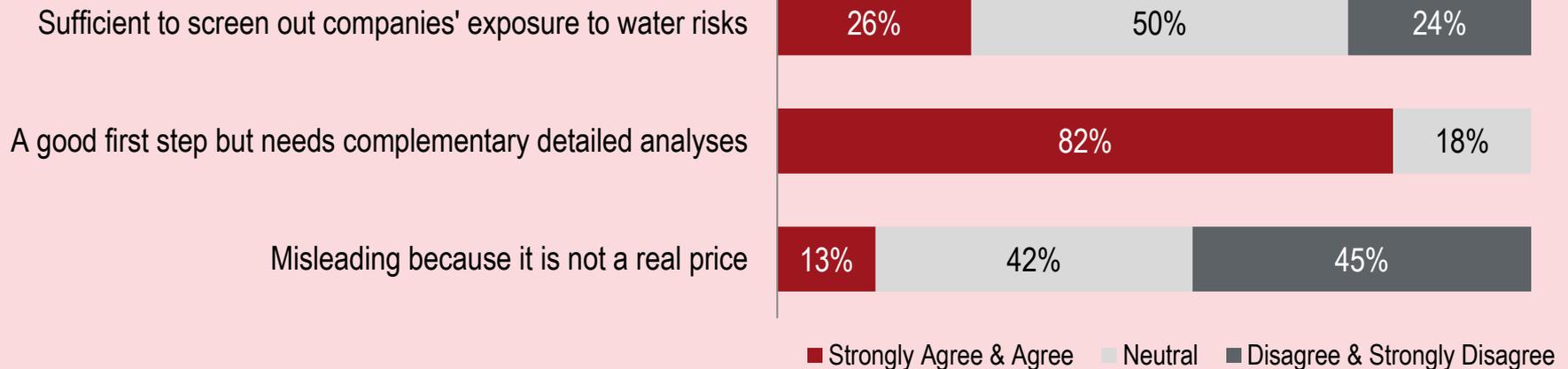
- 1. Impact varies across **sectors** ← water use power > water use mining
- 2. Impact varies across **companies** ← ≠ water use levels & locations
- 3. Impact varies across **tools** ← ≠ assumptions

## 2. Shadow pricing

- **Convenient** approach to integrate water in decision making
- Shadow water prices **too high** to be realistic water tariffs (up to 12USD/m<sup>3</sup>)
- Can be thought as a **proxy** for water risks in general

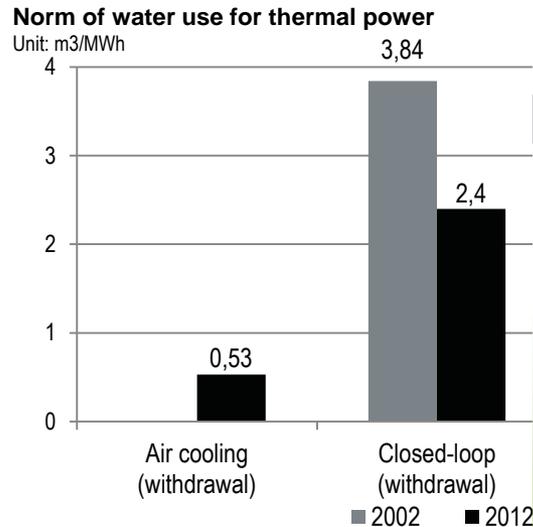
What investors say: **a good first step, but a first step only**

Using shadow pricing for water risk valuation is...



# 3. Regulatory risks & compliance costs

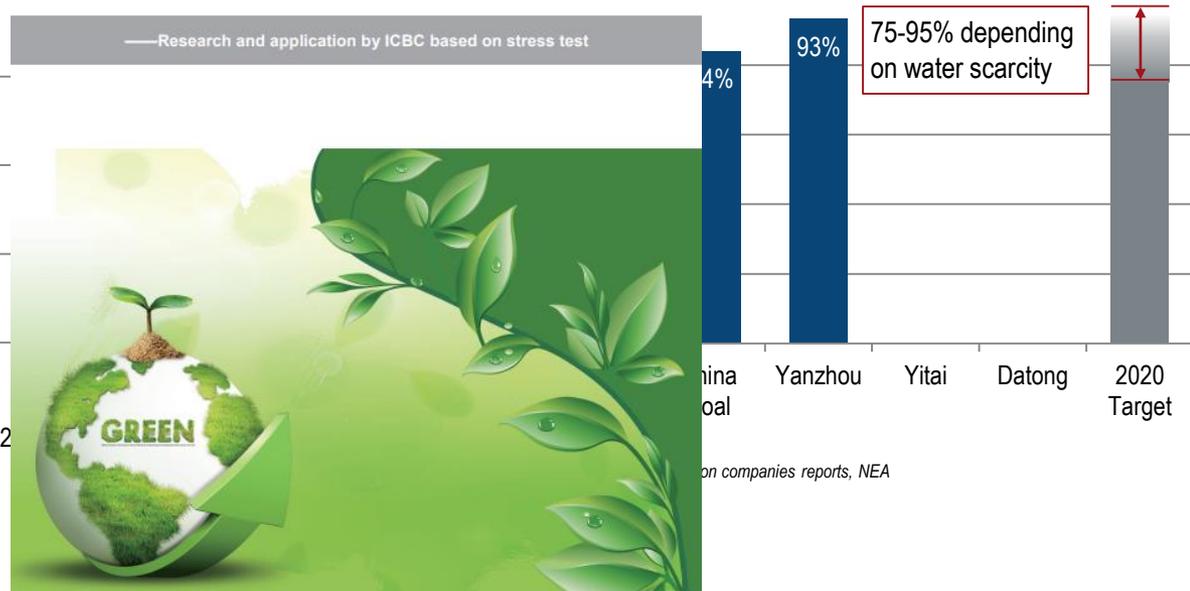
## Water use targets



Source: China Water Risk based on CNIS

## Water recycling targets

### Impact of Environmental Factors on Credit Risk of Commercial Banks

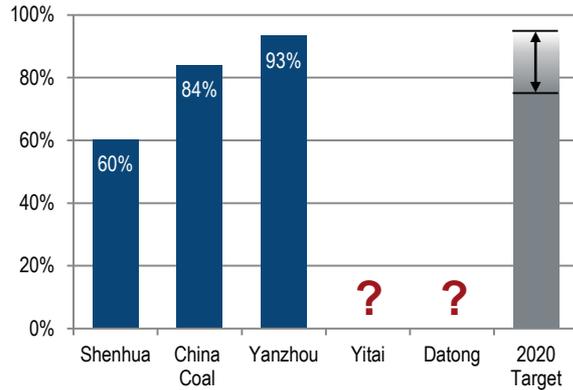


## Water quality targets



# A word on disclosure

## Mine water recycling rate

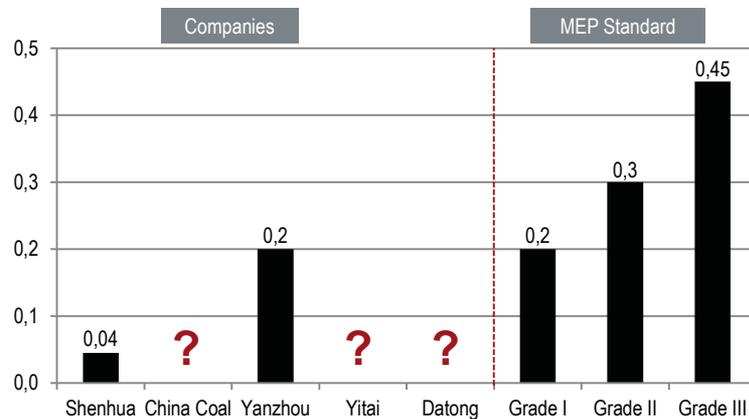


Source: China Water Risk based on companies reports, NEA

**?** INCOMPLETE DISCLOSURE

## Freshwater use for coal production - mining & processing

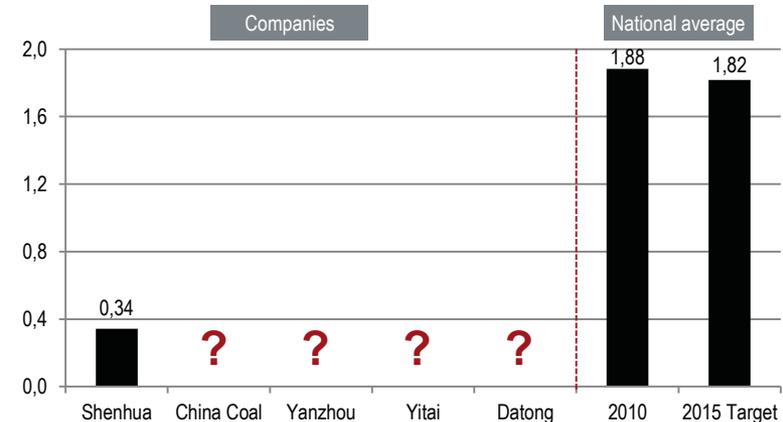
Unit: m<sup>3</sup>/tonne



Source: China Water Risk estimates based on companies reports and MEP Cleaner Production Standard-Coal Mining & Processing Industry (HJ446-2008). Water use includes coal mining and processing.

## Mine water drainage associated with coal production

Unit: m<sup>3</sup>/tonne

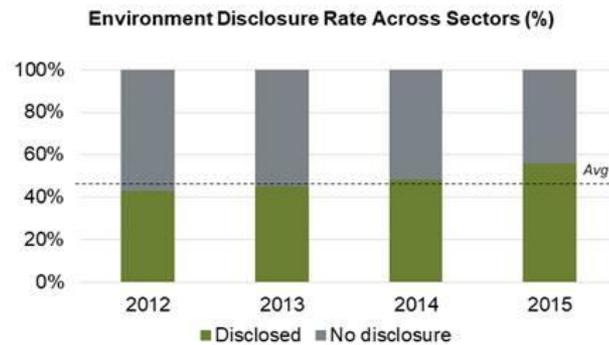


Source: China Water Risk based on companies reports and NEA-NDRC Action Plan to Develop Mine Water Utilization, 2013.

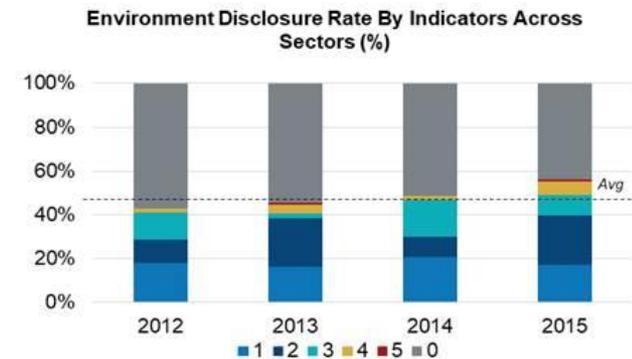
# A word on disclosure



The majority of disclosure is only on 1 or 2 of the total 5 indicators analysed, there is still clearly room for improvement



Source: China Water Risk, SynTao



Source: China Water Risk, SynTao

Two mid-performers are electricity and smelting, with lagging disclosure rates of 47% and 48%. Meanwhile, agriculture is the clear laggard

## Sector Ranking by Disclosure Category - 2015 Snapshot

| Environment     | Energy          | Water           | Waste           |
|-----------------|-----------------|-----------------|-----------------|
| Coal            | Oil & Gas       | Oil & Gas       | Coal            |
| Oil & Gas       | Automobile Man. | Coal            | Automobile Man. |
| Automobile Man. | Coal            | Automobile Man. | Electricity     |
| Smelting        | Electricity     | Smelting        | Smelting        |
| Electricity     | Smelting        | Electricity     | Agriculture     |
| Agriculture     | Agriculture     | Agriculture     | Oil & Gas       |

Source: China Water Risk, SynTao

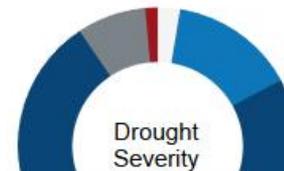
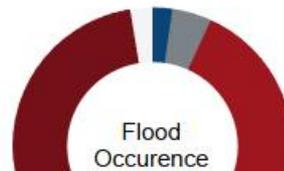
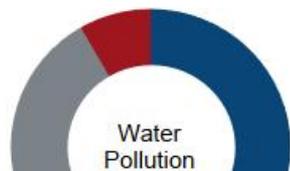
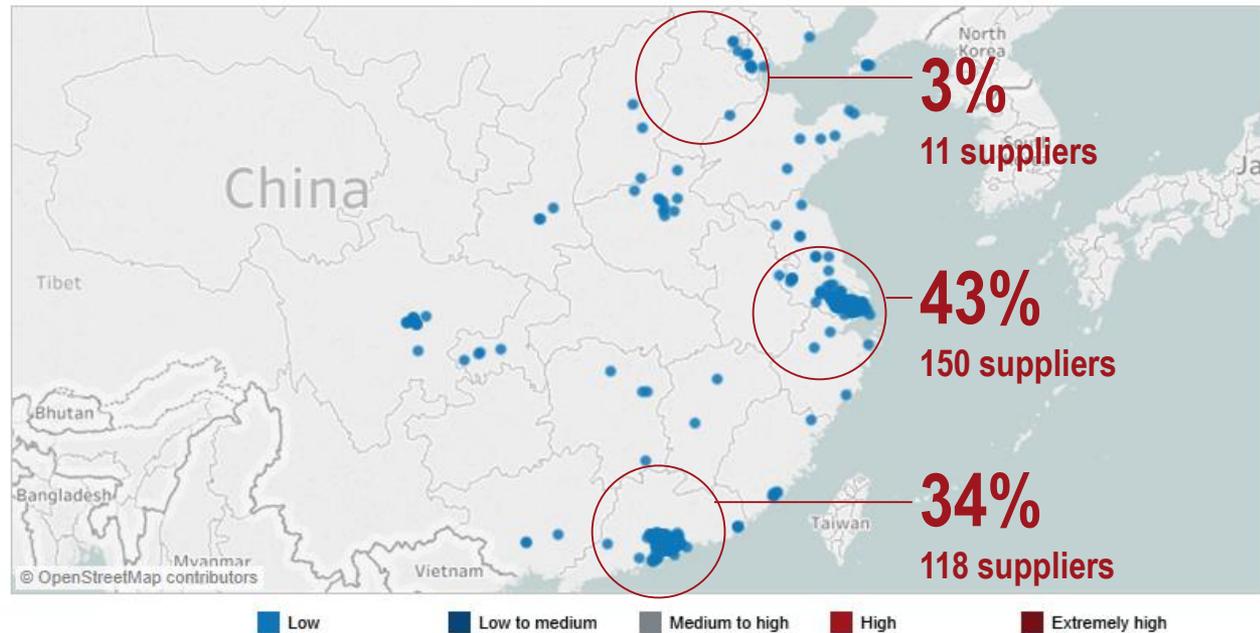
# Clustered risk – regional & sectoral

## WATER RISK EXPOSURE DASHBOARD

### Water 10

**Elec Co. C**  
Electronics

**350**  
Suppliers  
in China



Lenders / investors / companies should stress test for China pollution regulations

# Clustered risk – basin level

## Collective action within & across industries ?

### China task force on ERA



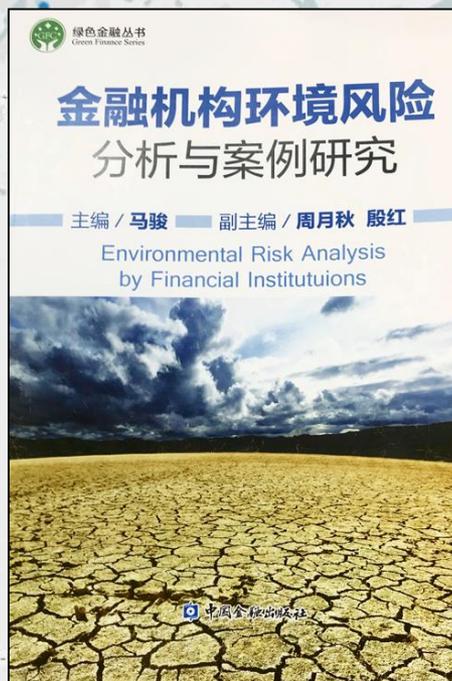
中国金融学会绿色金融专业委员会  
Green Finance Committee, China Society for Finance and Banking

ICBC  中国工商银行  
INDUSTRIAL AND COMMERCIAL BANK OF CHINA



Jan 2017 ... CWR invited to talk at  
PBOC & to join ERA task force

Apr 2018 ... China  
publishes first-ever book  
on ERA ... CWR invited  
to write the water risk  
chapter



Embedding environmental risks into lending = basin level risk assessments

# Decisions today for water tomorrow



**BLUETECH  
INSIGHT  
REPORT**

Power In China:  
Opportunities & Drivers In The  
Water Technology Market

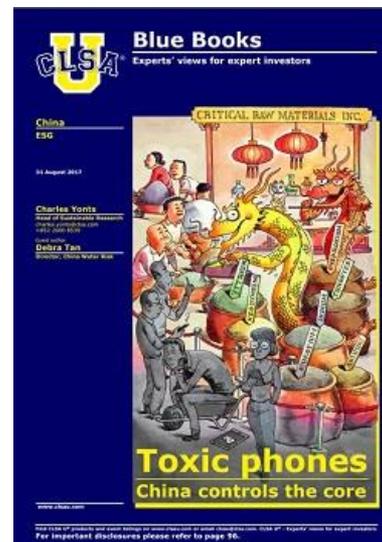
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GAPS TO OVERCOME FOR CLEAN & CIRCULAR FASHION



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31 August 2017

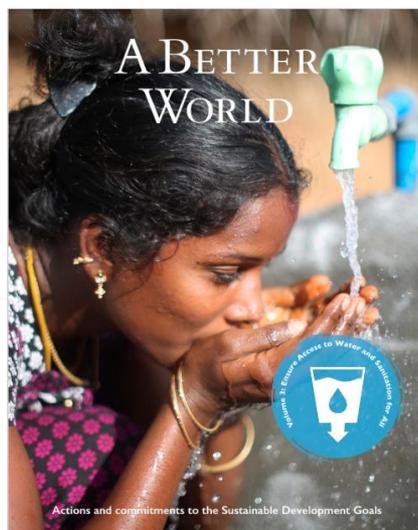
Charles Yonts  
Head of Sustainable Research  
at CLSA

Guest author:  
Debra Fan  
Senior, China Water Risk

**Toxic phones**  
China controls the core

www.chinawater.com

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**A BETTER  
WORLD**

Actions and commitments to the Sustainable Development Goals

Access to Water and sanitation  
By 2030

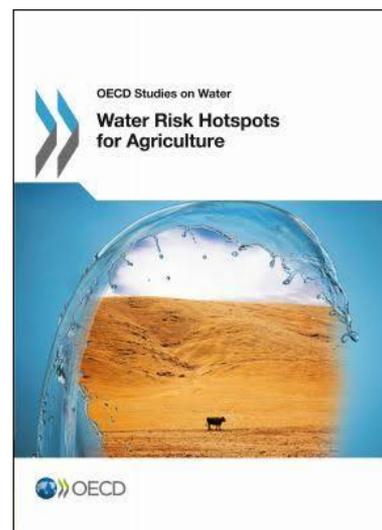


**INSIGHT.**  
The Journal of the American Chamber of Commerce in Shanghai - Insight Magazine 2017

**GETTING  
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GREEN**  
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Can China navigate its environmental challenges while maintaining strong economic growth? We take a closer look at government policies and business strategies promoting sustainable development and green growth in China.

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**OECD Studies on Water**  
Water Risk Hotspots  
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## 2017 reports & publications

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DECISIONS TODAY FOR WATER TOMORROW

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