# Chinese Coal Use: The Triple Choke Points

GREENPEACE 绿色和平

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# Outline

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  - China’s coal addiction
- Political Signal of Limits
- The Triple Environment and Resource Constraints:
  - Water resource
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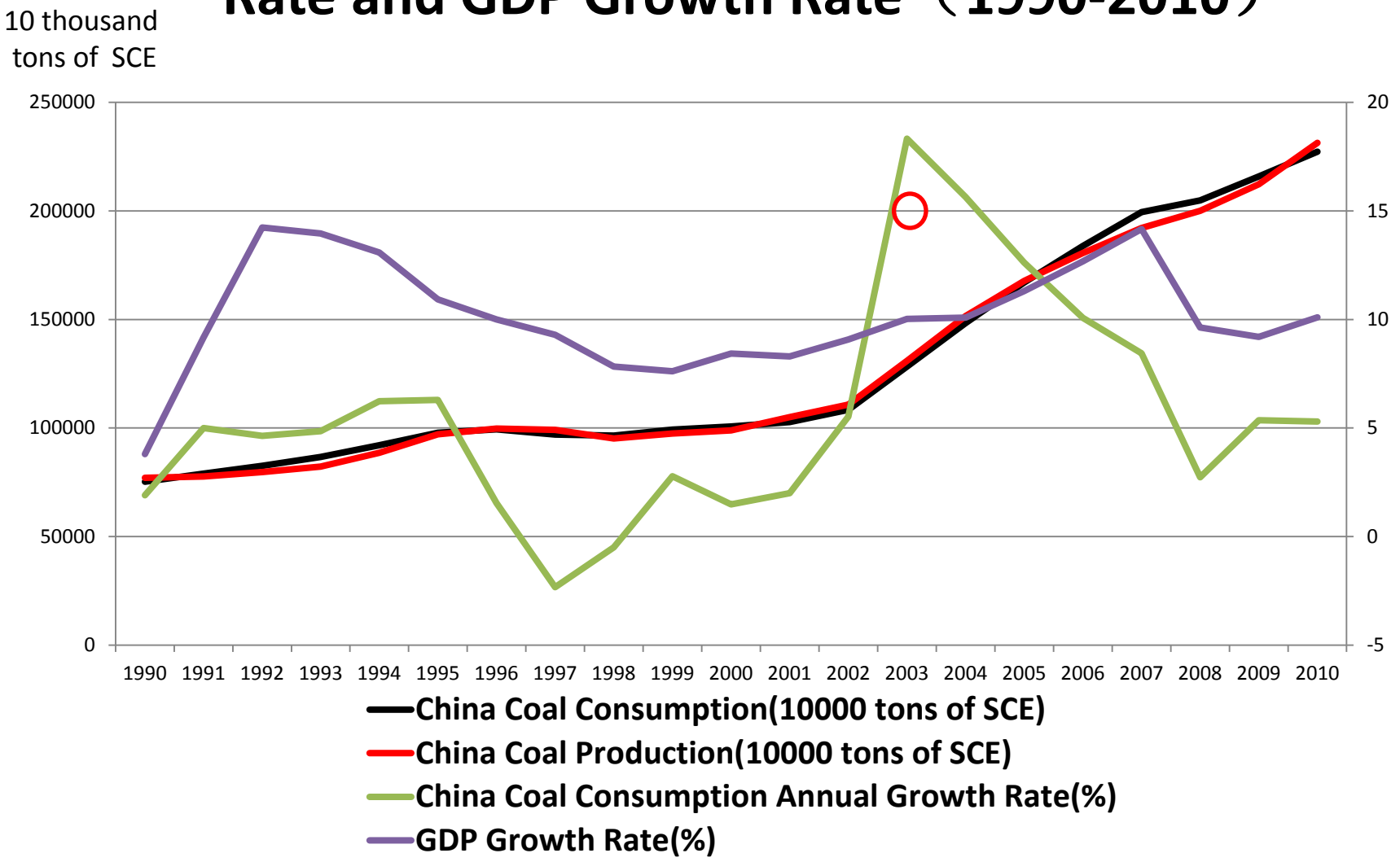
- Point of Decision

# Background – China's Coal Addiction

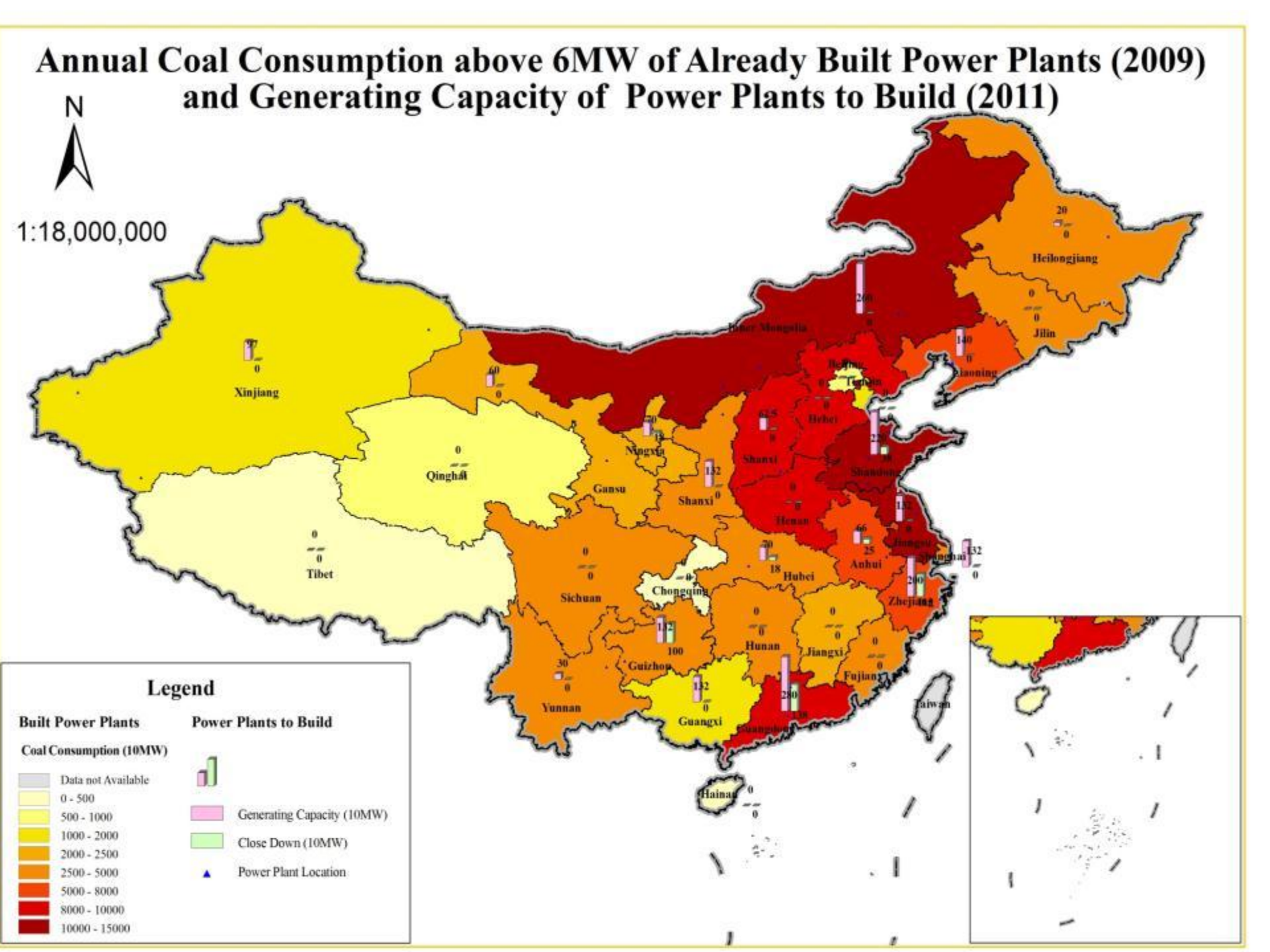
- China = world's largest coal producer , user and biggest emitter of CO2.
- 2011: half of global coal production (BP); consumption reached 3.52billion tons
- Total CO2 emission over 9Giga Tons by 2011 (BP); per capita levels in 2011 are getting close to average of European levels (7.2t vs. 7.5t)
- Over reliance on coal, nearly 70% of primary energy use; 80% in power generation
- Non fossil fuel 8.1% in primary energy use in 2011

# Coal Production, Consumption, Coal Use Growth Rate and GDP Growth Rate（1990-2010）




Data Source: China Statistical Yearbook(2010), National Economic and Social Development Statistical Communique in 2010

# Annual Coal Consumption above 6MW of Already Built Power Plants (2009) and Generating Capacity of Power Plants to Build (2011)



# Political Signal of Limits?

- Political will to curb coal growth:
  - China's 12th five year plan (2011-2015) sets a non-binding limit to Coal Production & Use to no more than 3.9 billion tons by 2015, not much space left compared to the present levels of use (3.5bt 2011).
- Political significant & compatible with 40~45% carbon intensity target
- Non-binding Total Energy Consumption Control as well. Experts calling for a tighter cap on coal.
- China's 13th five year plan (2016-2020) is key to China's and global climate efforts. Drafting of the plan starting in 2013/2014

# Environment & Resource Constraints / Choke Points

## for unlimited growth of coal

Water Resource

Air Pollution

Carbon Emission

# Choking Point ONE:
# Energy is future, but water is life

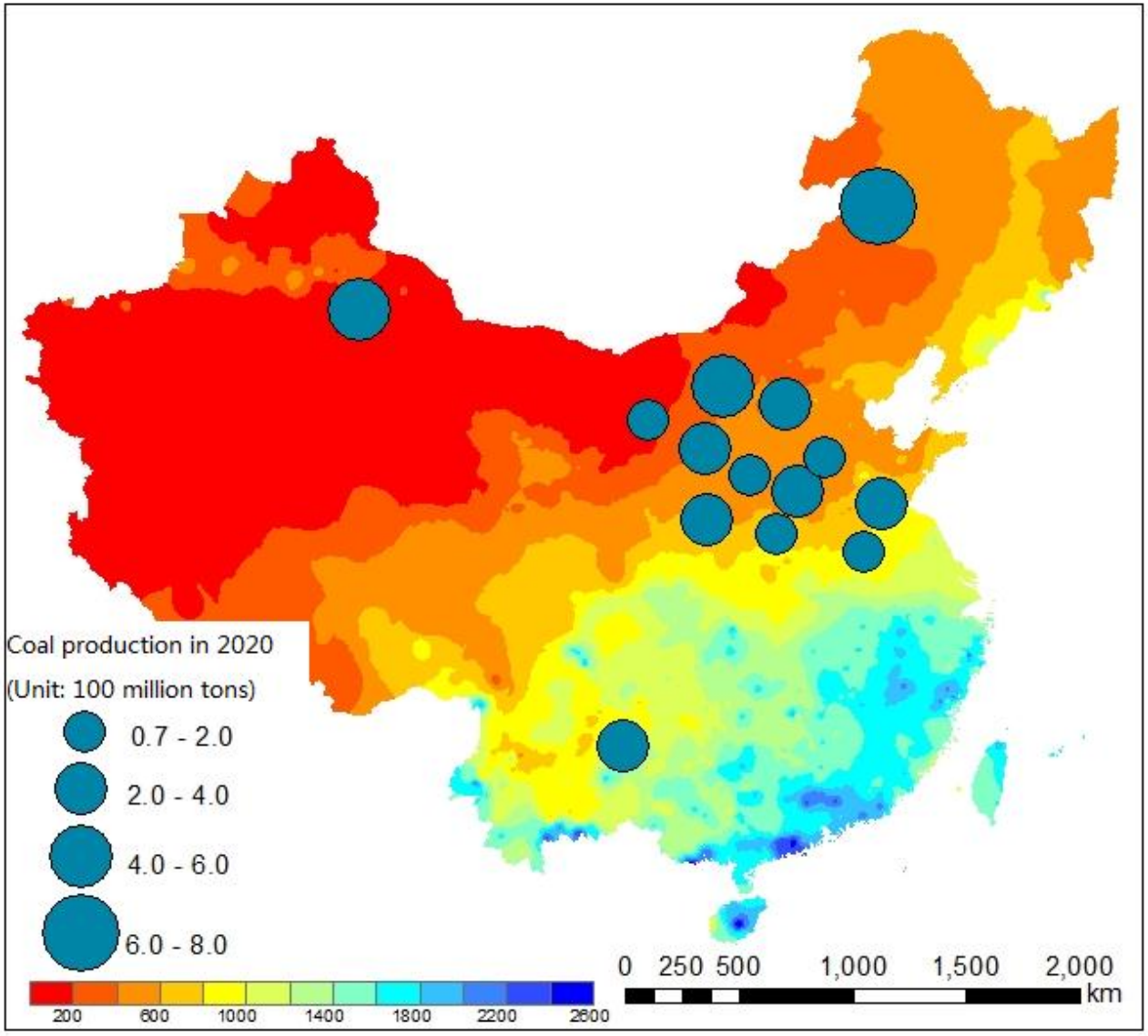
Coal mining, power generation, and coal based industry are water intensive!

-mining: 1t:2.5m3 ground water disruption /2.5m3 water in washing

-power: 1t:7.6m3 for cooling, ash, etc.

-chemical: 1t: 10~15t

A major mismatch between Coal & Water Resource



# <Thirty Coal> Report

- For the 14 coal power bases (mining, power generation + coal chemical):

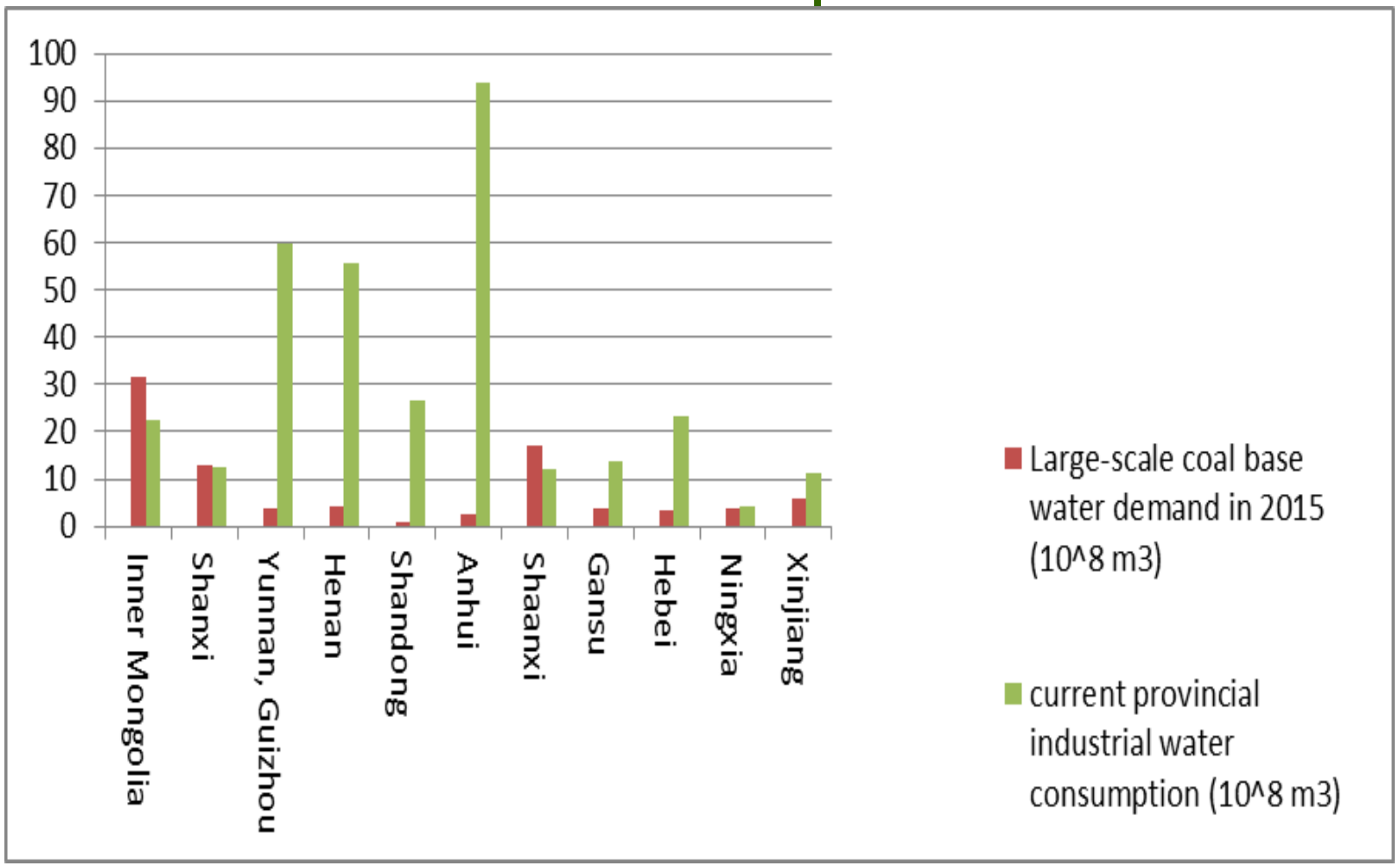
Greenpeace together with Chinese Acadamy of Science estimates:

- water demand created by these coal development plans - at least 9.98 billion $m^3$ in 2015---equivalent to 1/6 of annual water volume of the Yellow River.
- Water demand in coal power bases will challenge or exceed provincial industrial water supply capacity.

Top leaders calling to practice

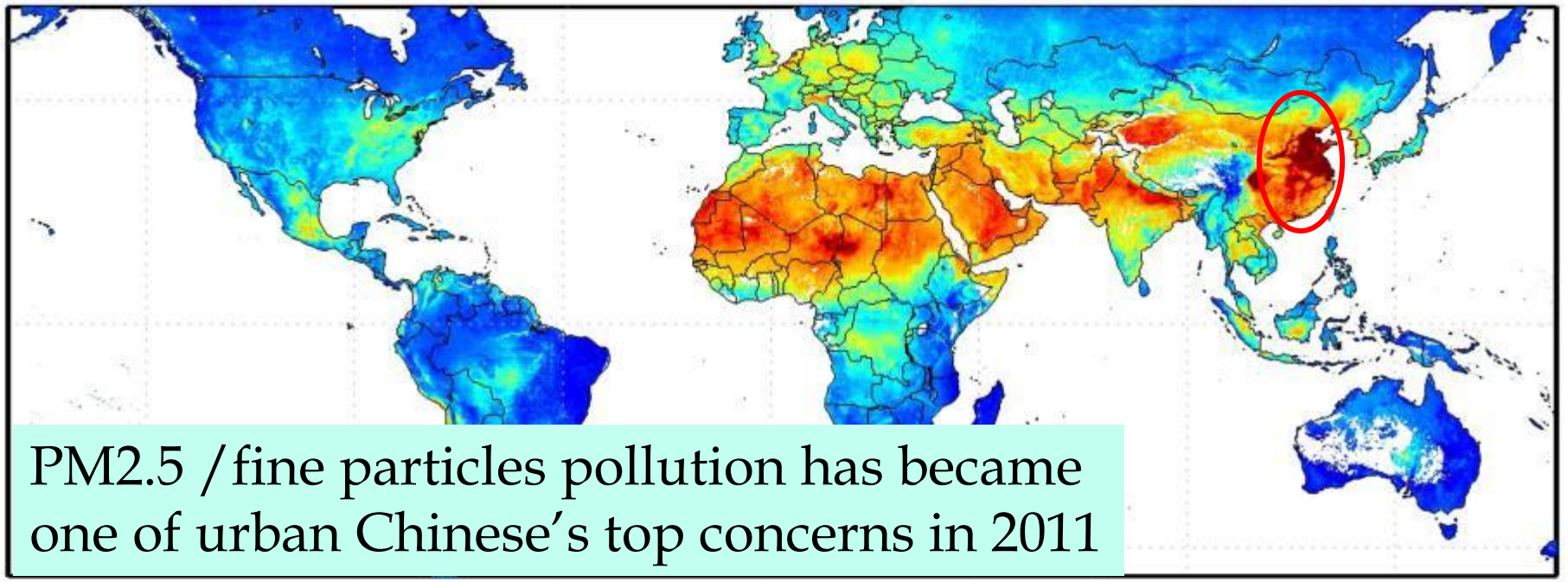
“the strictest water management regime”

# Coal water demand in 2015 vs. current industrial water consumption

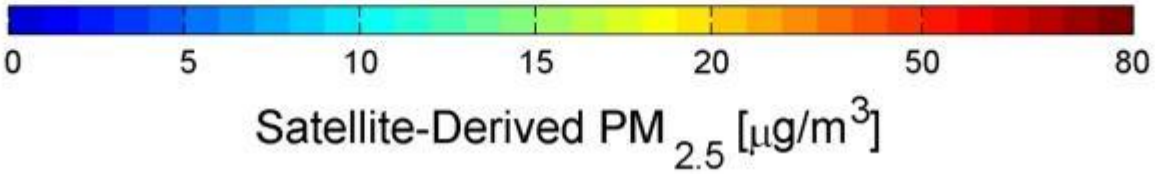


Already causing severe ground water depletion,  river cut off and pollution , leading to ecological and social problems

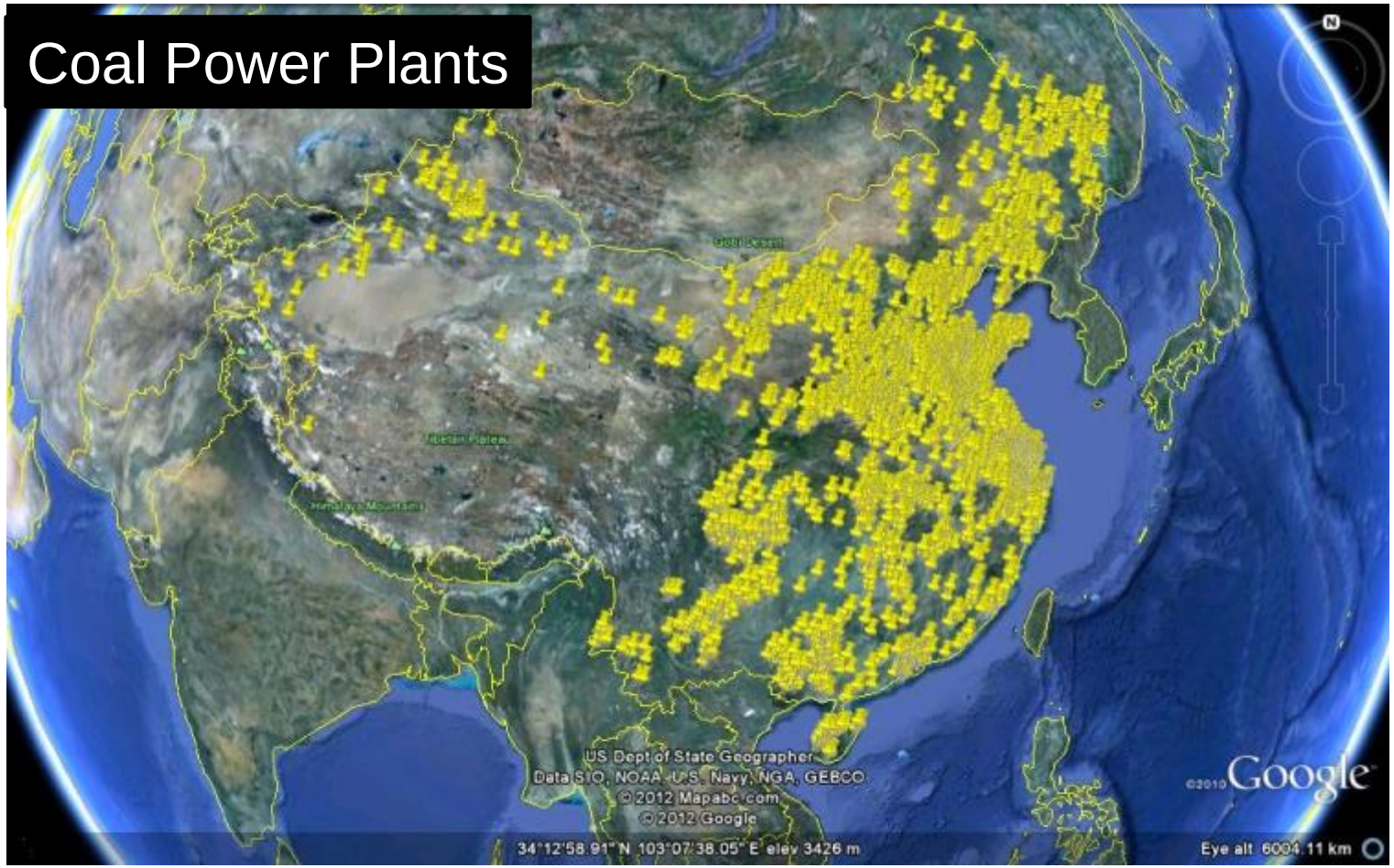
# Choking Point TWO
# Air pollution



PM2.5 /fine particles pollution has became one of urban Chinese's top concerns in 2011

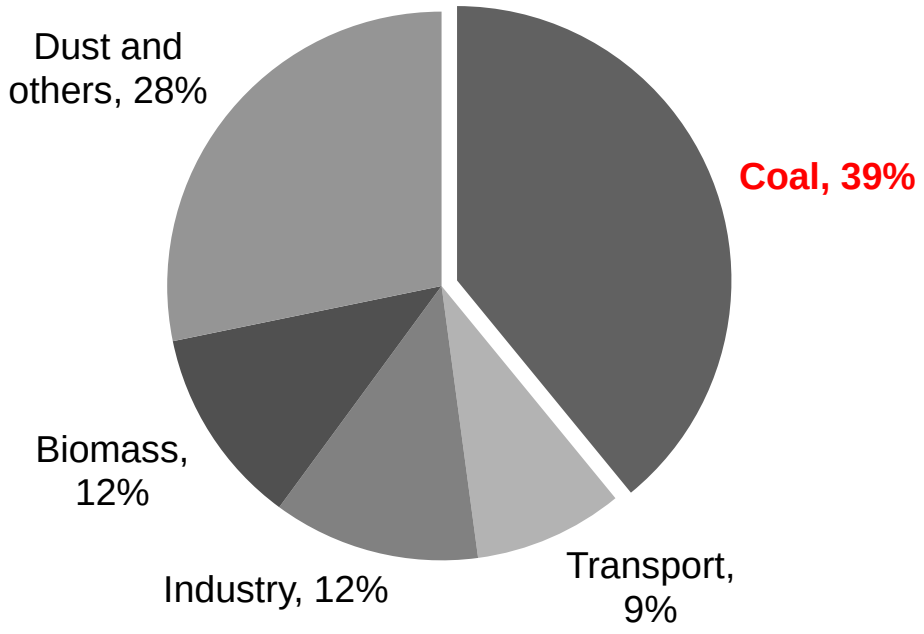


# Large contribution from coal burning



- Almost 40% of PM2.5 from coal in Beijing. Beijing can only meet air pollution targets by reducing coal, including coal in neighboring provinces
- Coal pollutants are the main source of cancer risk from PM2.5 in many Chinese cities
- Pollution from coal fire power plants kills approximately 190,000 people per year in China

**Source contributions to PM2.5 in Beijing**




Yao et al 2010; Zhang et al 2012

# Choking point – air pollution

## Central calls

- New air quality standard (released this Spring) includes fairly strict limit on PM2.5, (75 **µg** $m^3$) which needs to be met by cities by 2016.
- Two thirds of Chinese cities fail to meet the standard, and require drastic measures to improve by 2016.
- Target is especially hard for key eastern megacities, which have majority of coal plant around them.

## Local acts

- Beijing pushed coal outside, but is suffering from surrounding emissions from neighboring provinces.

**27mt → 15mt by 2015**

- Guangzhou limiting coal use to 2010 level because of air quality standard challenge.

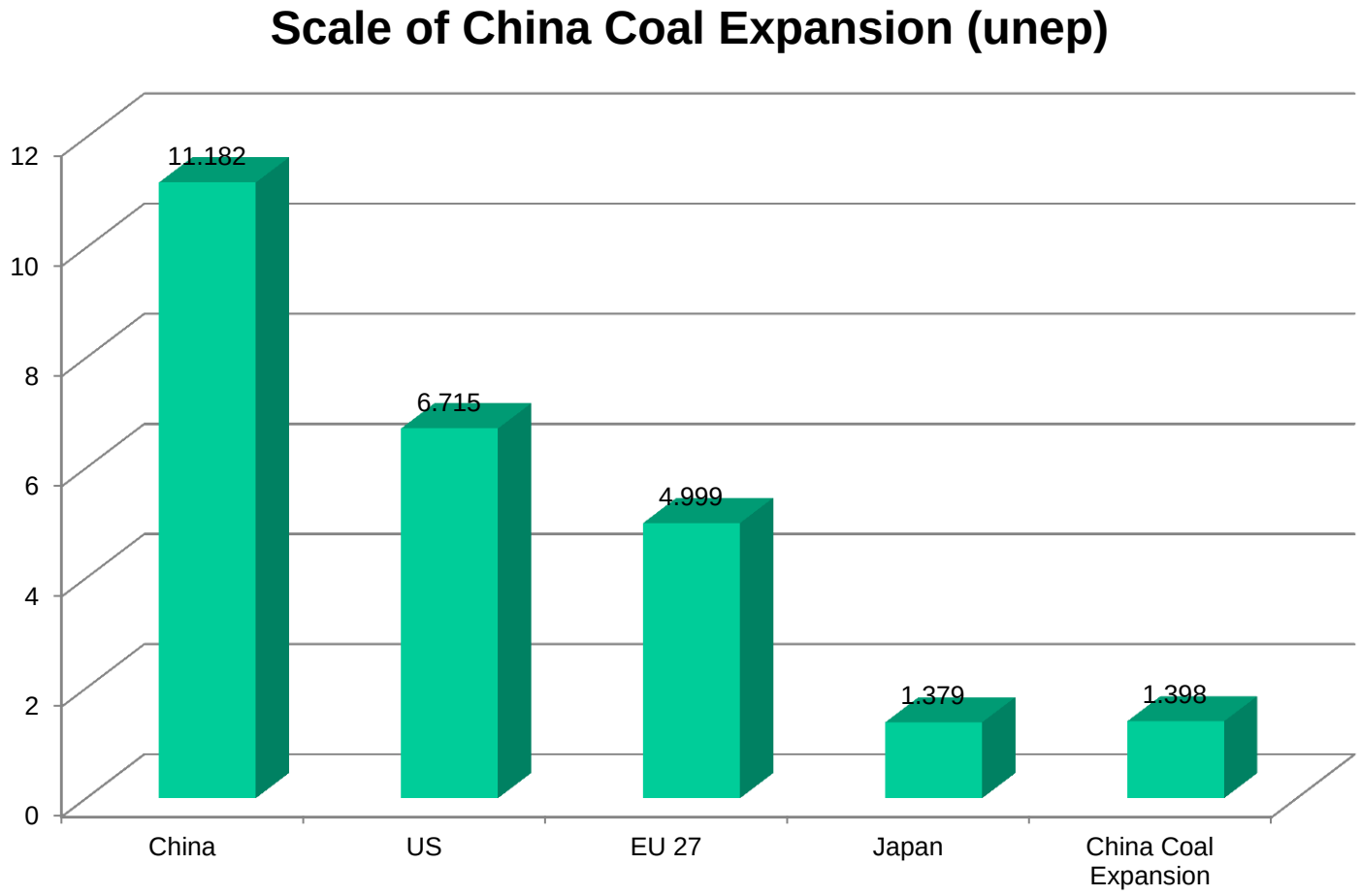
**Zero growth → 2015 (27mt)**

- Eastern province struggling on clean air will have implication to their coal import

# Choke Point 3: Climate implication

- Expansion of 14 coal bases in north and western provinces creates major additional CO2 emissions
- Each base has tens of coal power plants,  whole expansion in the scale of hundreds of new coal power plants.  (we counted 351GW existing & to be built by end of 2015)
- Rough calculation: By 2015 this expansion alone would release 1.4 Gt of  additional CO2.

Can those province still manage to achieve their binding carbon intensity targets?




Without tackling its coal problem, China won't be able to curb its carbon growth in the long run

# Point of decision



**Environmental and Ecologic Losses from Coal Use and Exploitation Equivalent to 7-9% of Annual GDP**







Data Source： “True Cost of Coal”, Greenpeace China Program,2008

# Recommendations

- Serious implementation of 3.9bt coal limit in the first place, including aligning provinces with this target
- China needs to have put a brake to some provinces' dirty/unchecked growth
- Expand regional coal cap in city clusters/provinces + Strengthen Energy consumption control

# Thank you !

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