China After Paris:

Data and measurement issues with China's Paris pledges

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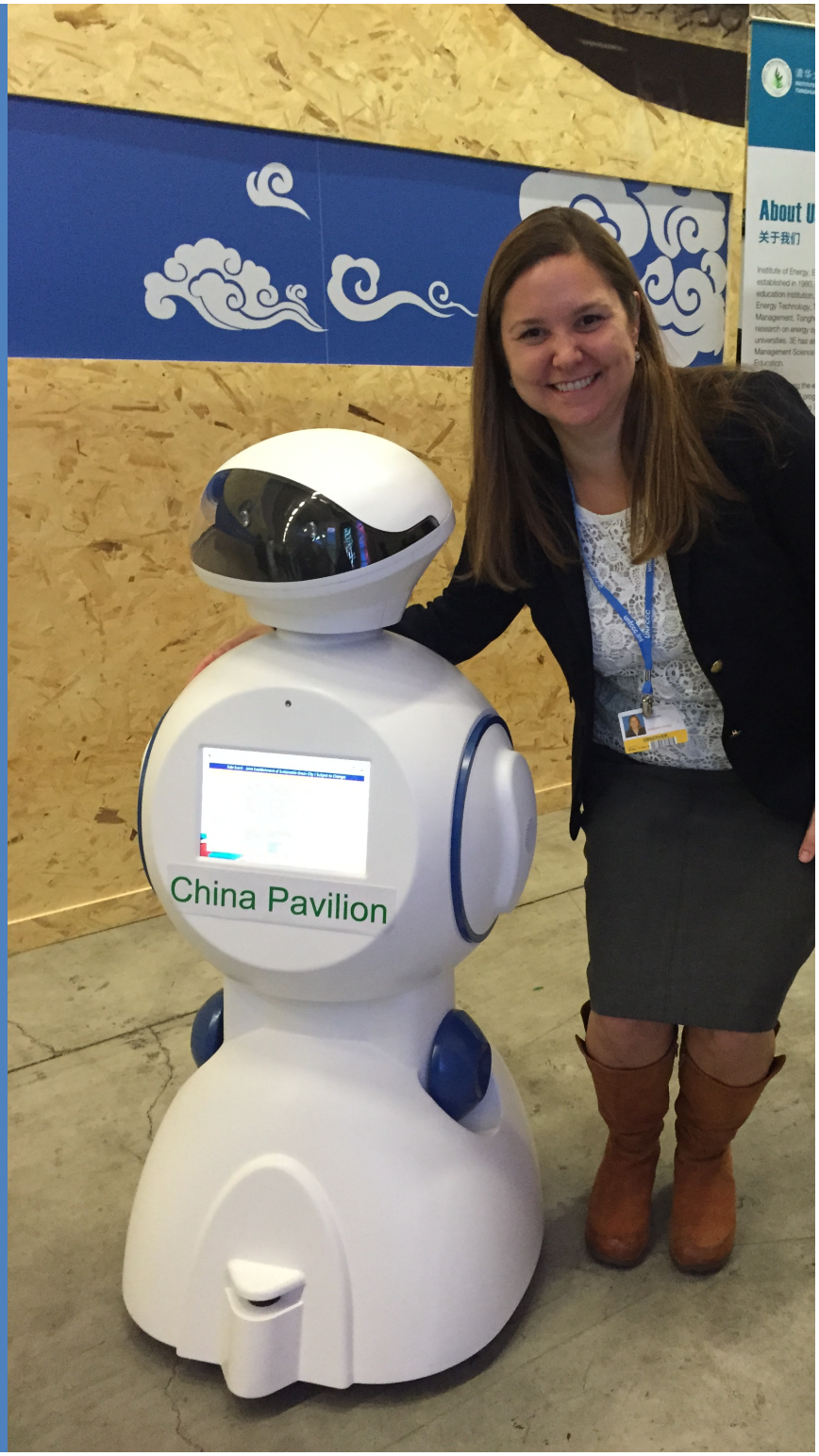


How Paris Will Strive for Success That Eluded Copenhagen Talks

Paris climate talks ready to exorcise the ghosts of Copenhagen's failure

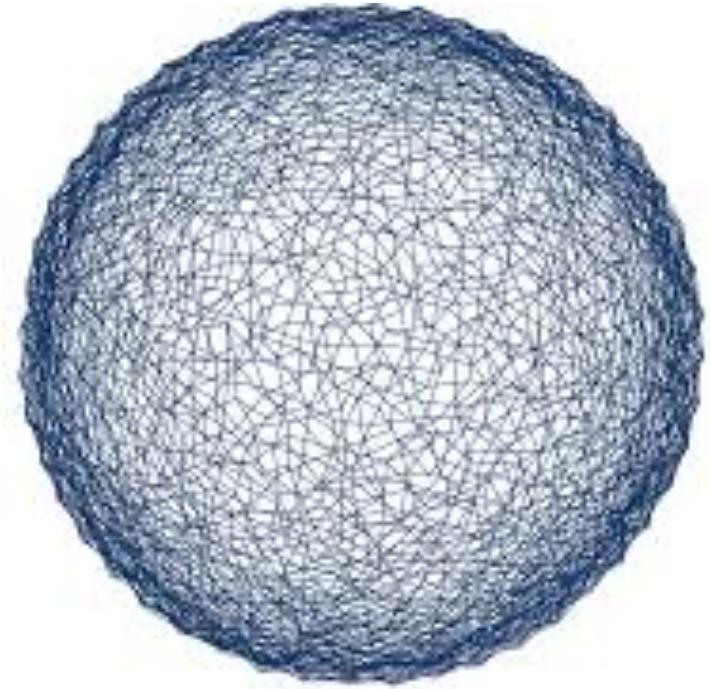
How Paris may succeed where Copenhagen failed

Paris climate summit: Don't mention Copenhagen

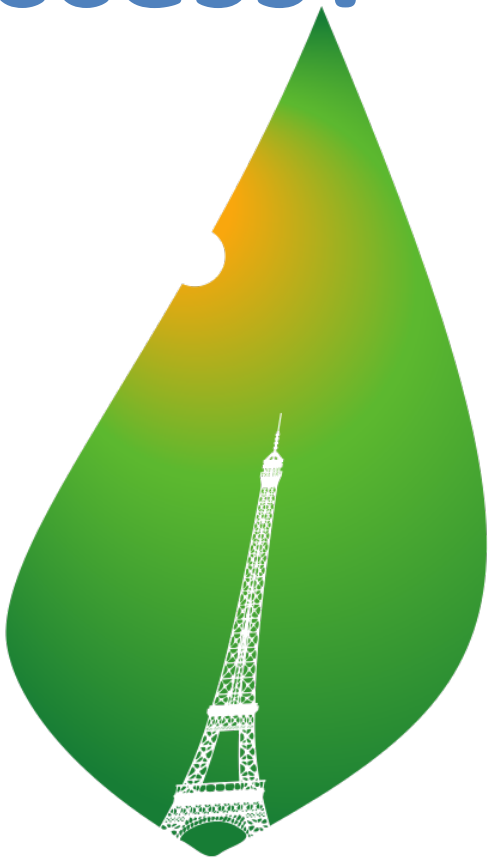
The Copenhagen Failure vs. The Paris Success

DECEMBER 14, 2015

Why was Paris a success?

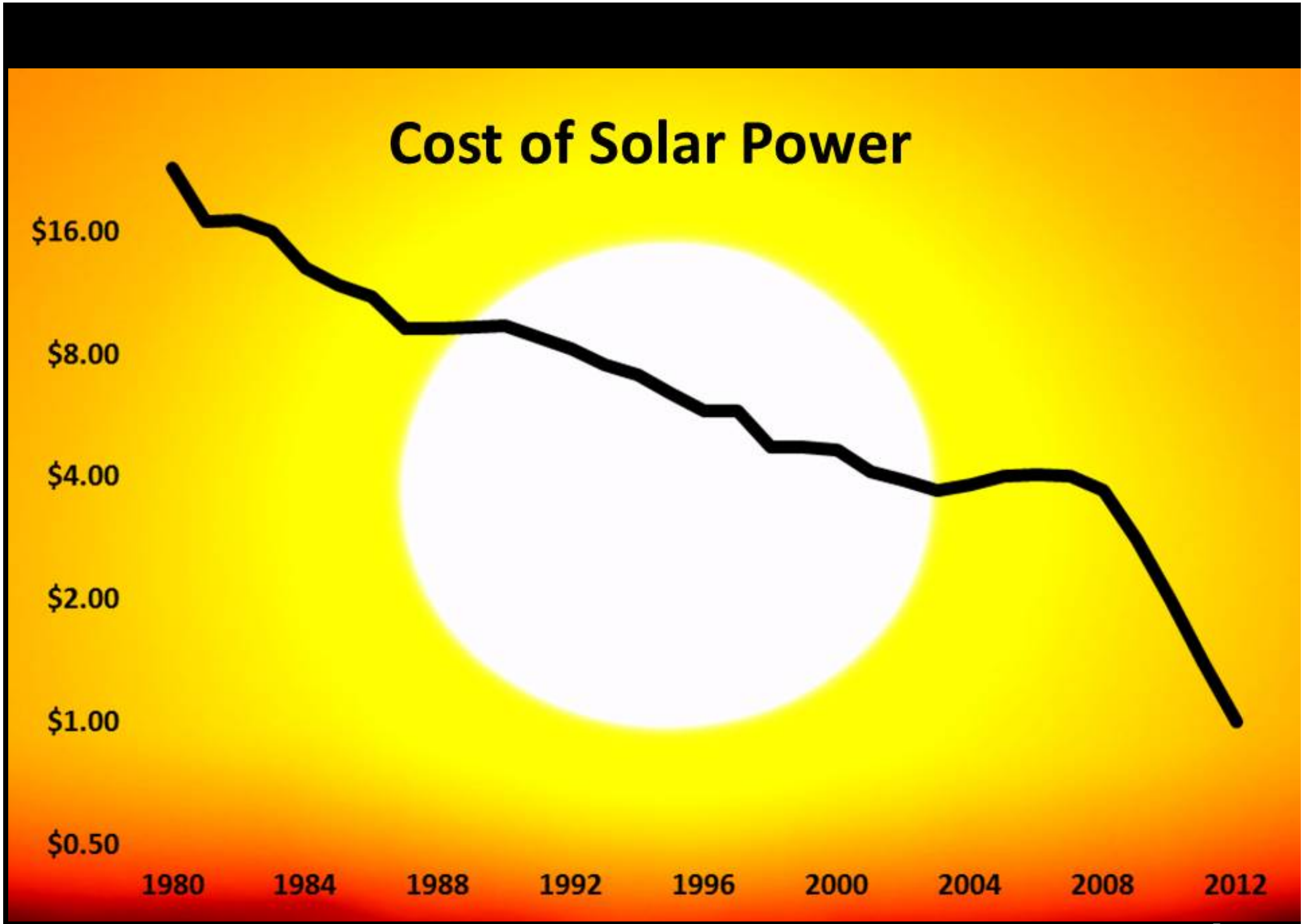


COP15
COPENHAGEN
UN CLIMATE CHANGE CONFERENCE 2009

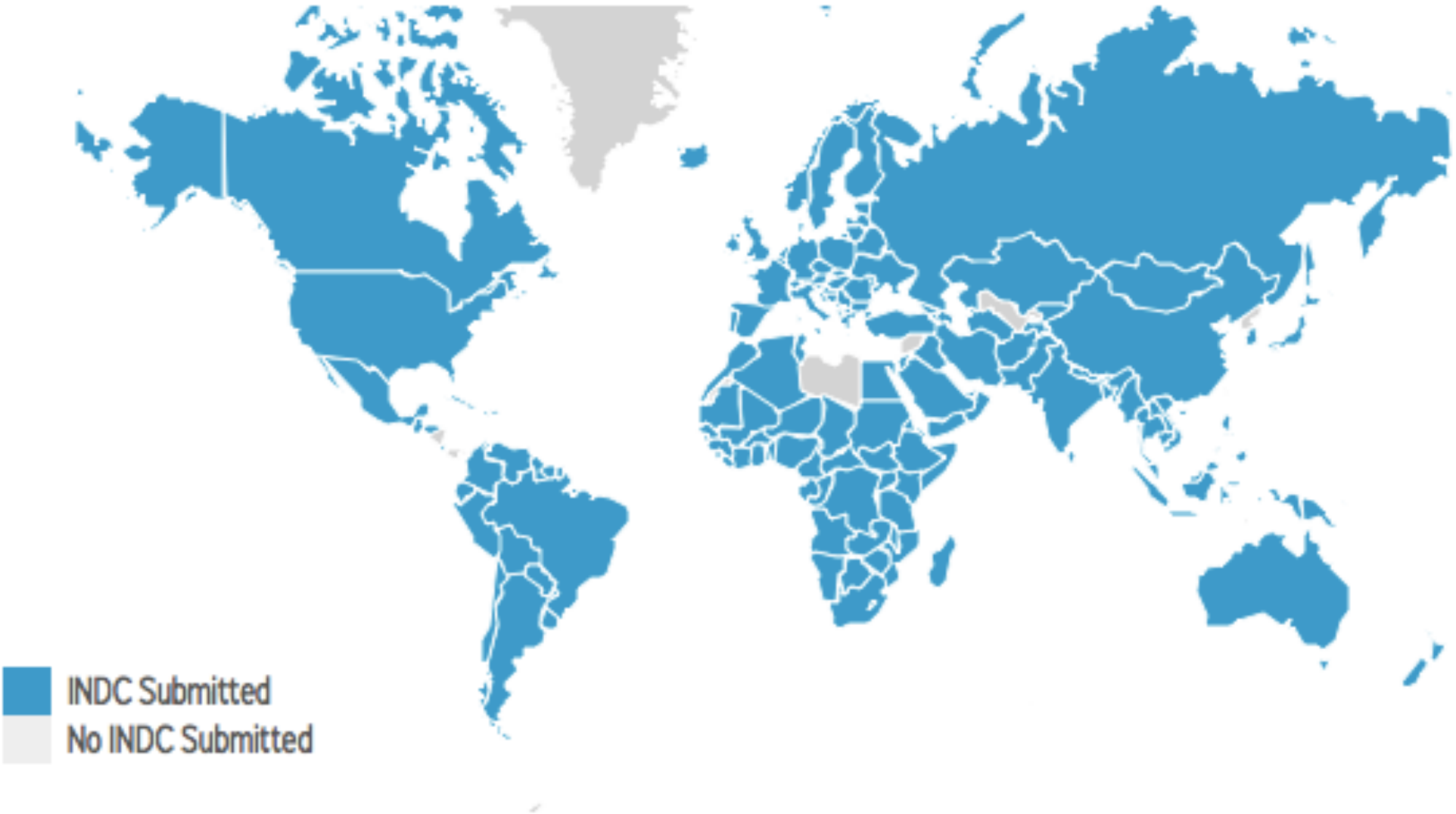


PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11


PRESIDENT



http://rameznaam.com/2013/11/14/solar-power-is-dropping-faster-than-i-projected/



http://cait.wri.org/indc/

A “bottom up” agreement

The Good

- Not one size fits all– countries can tailor to their domestic situation
- Countries can submit pledges that are politically viable, backed by national regulations
- Led to 188 countries having an INDC

The Not So Good

- Not a lot of guidance about how to format your targets/years/metrics
- Makes it difficult to compare targets across countries
- And sometimes can even make it difficult to track progress within one country, particularly when data quality and transparency is already an issue

Chinese energy data

Common challenges

- Misreporting
- Discontinuity of references
- Frequent revisions to official data going back multiple years
- Lack of transparency
- Sensitivity to criticism
- Language barriers

Remember when coal went down in the late 1990s?

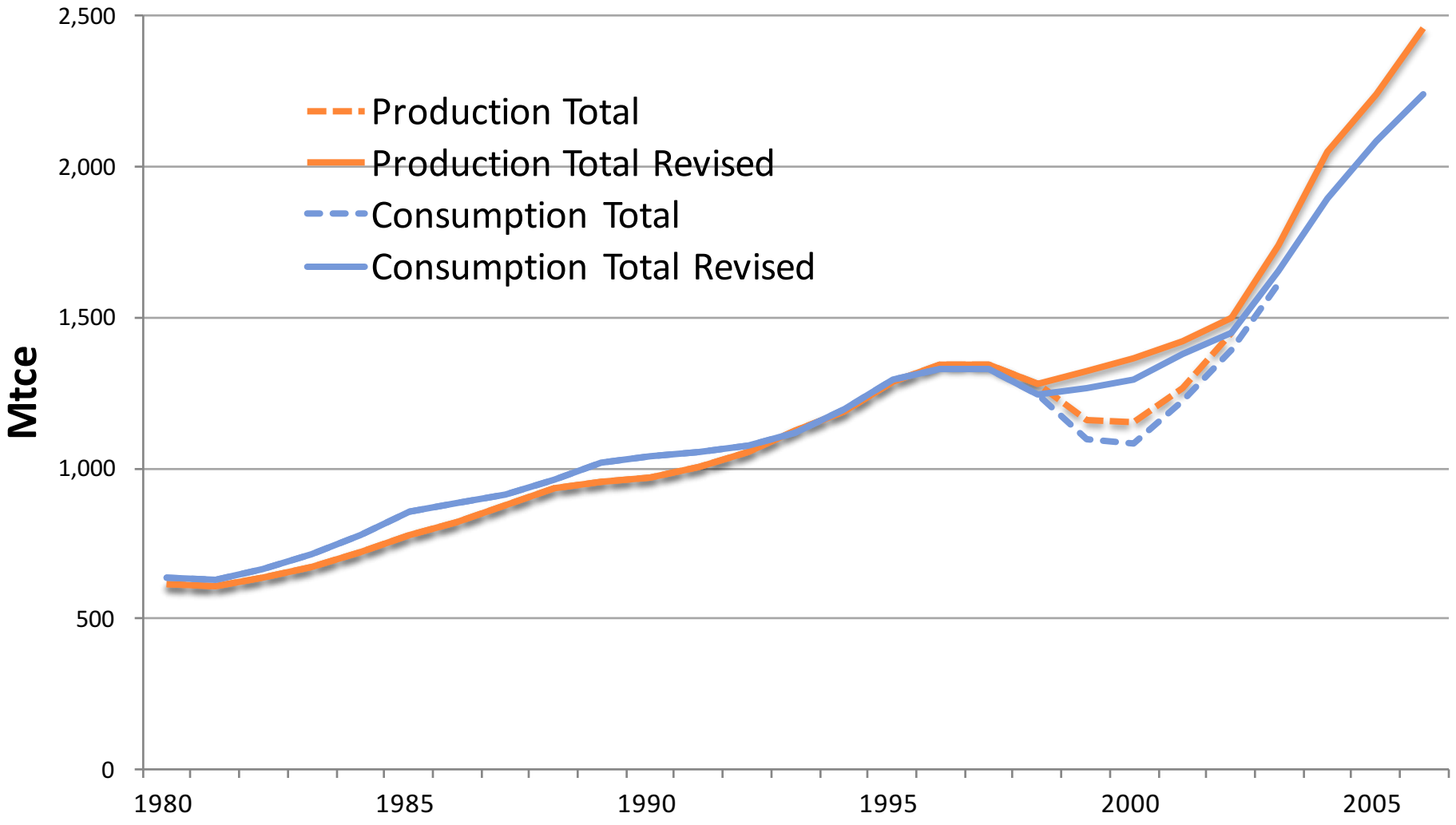
- Chinese statistics reported a decline in coal use (and CO_2 emissions) in China for the first time in decades
- The cause was believed to be due to:
  - Industrial restructuring in energy intensive, state-owned sectors, related to WTO accession
  - The shutdown of many small coal mines by the government (many of which were later shown to be still operating)

The 2005 statistical revision

- In the 2005 *China Energy Statistical Yearbook*, China's National Bureau of Statistics (NBS) published revised energy production, consumption, and usage data covering the years 1998 to 2003
- In order to accommodate underestimated service sector growth, the NBS also released revised GDP data that year

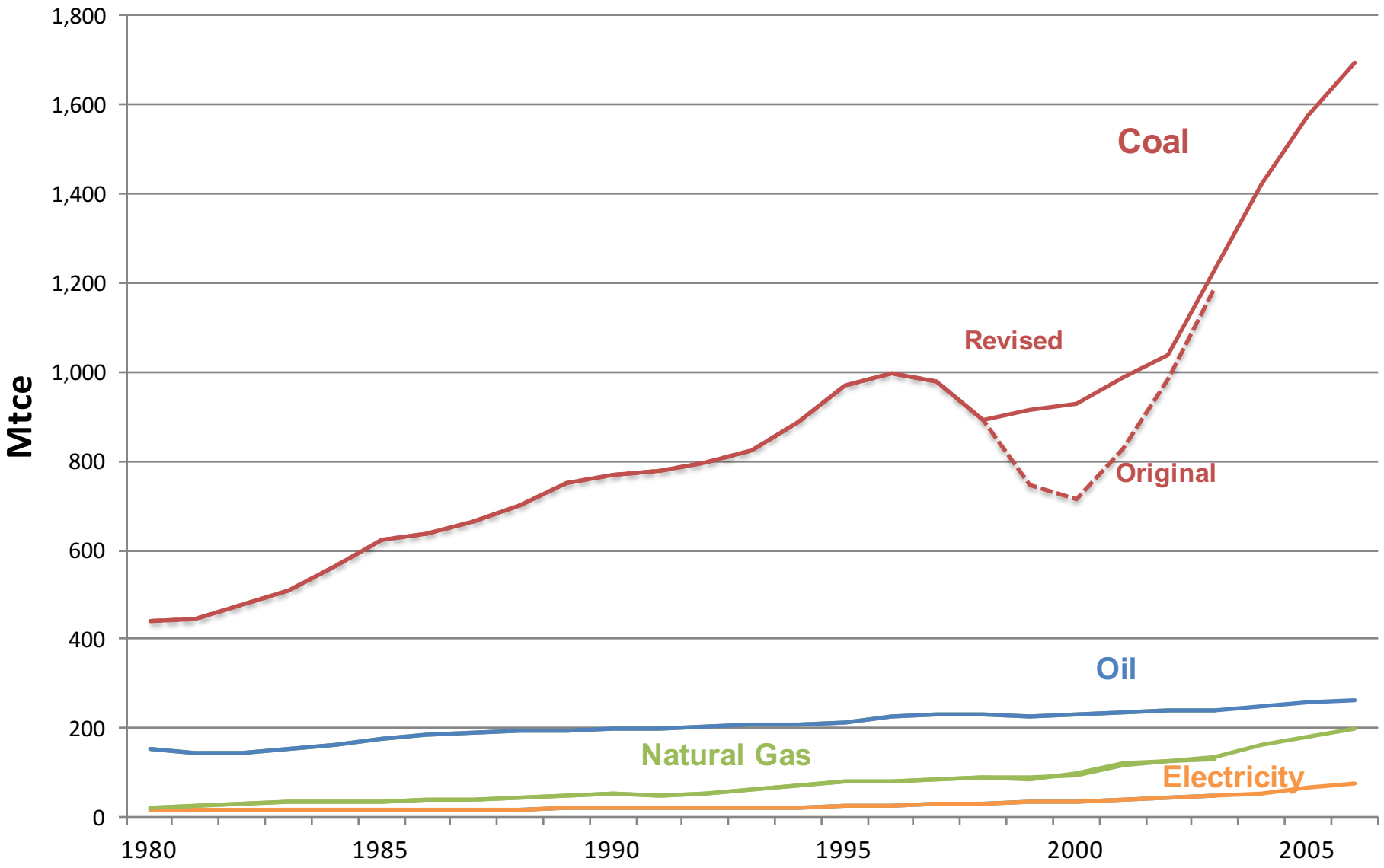
Source: LBNL China Energy Databook v.7 (2008)

Revisions to overall energy production and consumption data



Data from LBNL China Energy Databook versions 6&7 (2004 & 2008)

Revisions to coal production data

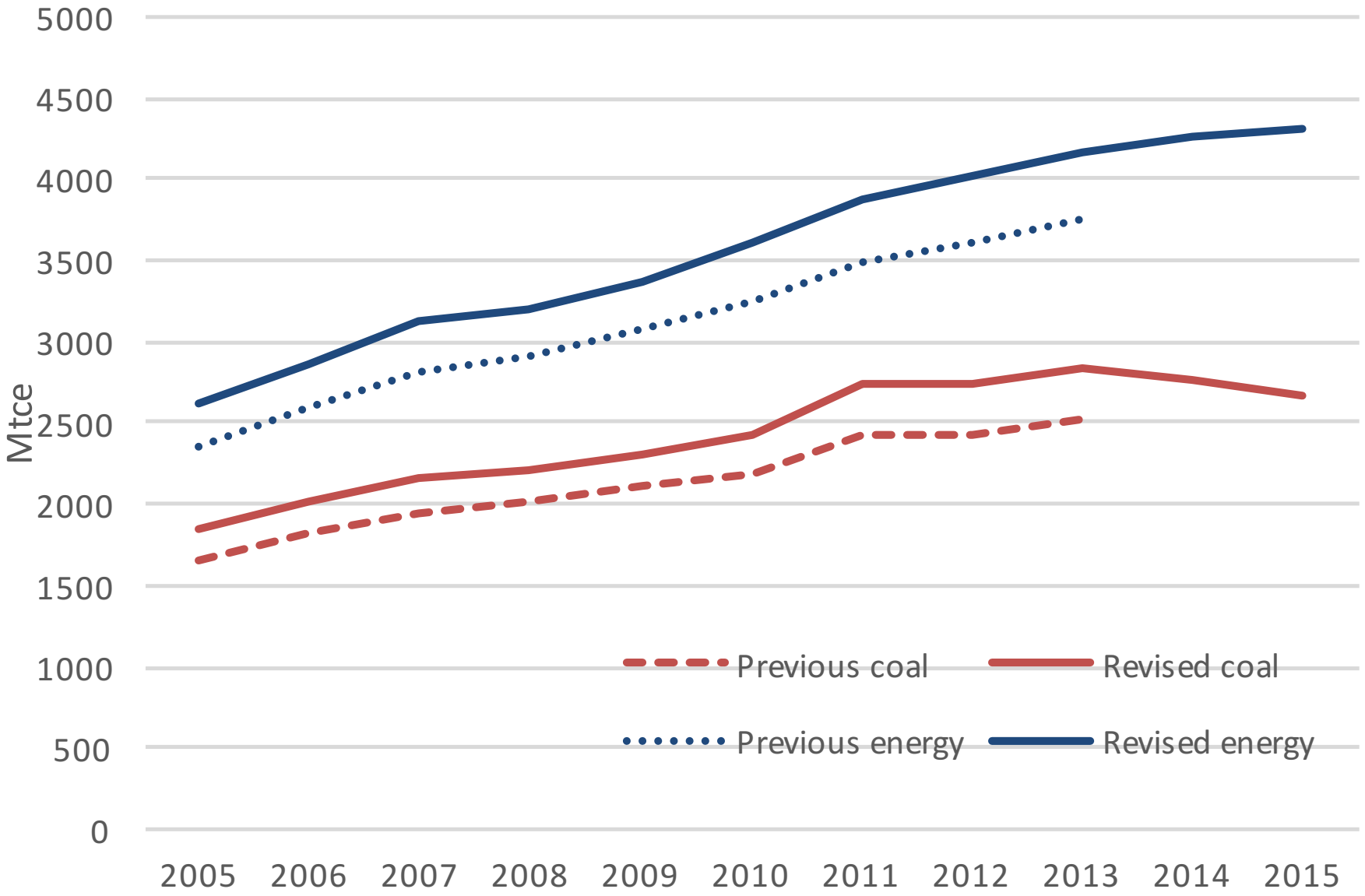


Data from LBNL China Energy Databook versions 6&7 (2004 & 2008)

The early 2015 statistical revision

- In February 2015, NBS released new data on energy and coal consumption, and GDP growth rates
- IEA revises carbon emissions estimates for China
- Nov 2015 New York Times front page article “China burns more coal than previously thought, complicating climate talks”

2015 revised coal & energy data



Data from LBNL China Energy Group

What did we learn?

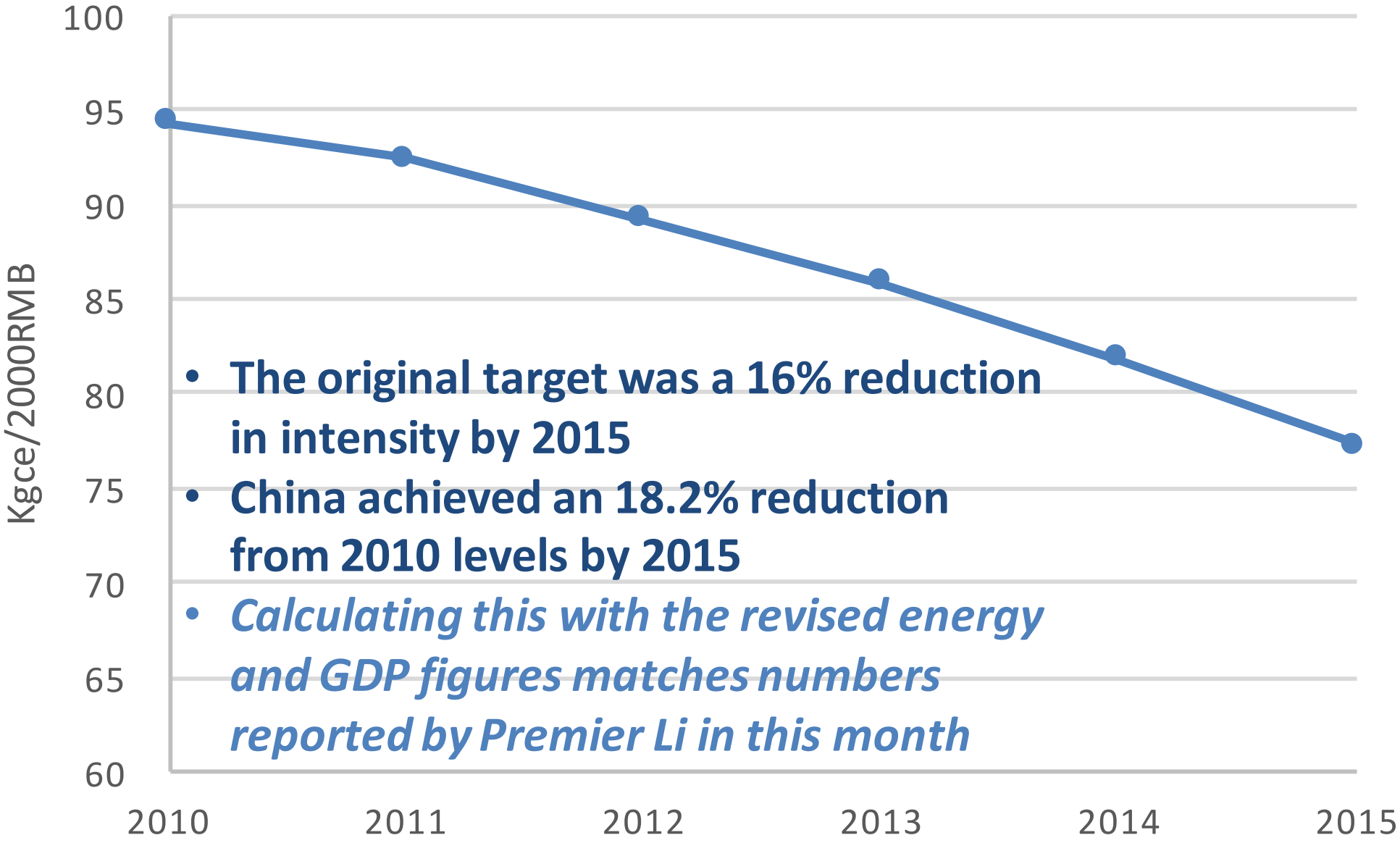
- There is more coal than we thought
- But… it became clear that coal consumption is declining
- And, the statistical error entry in the coal balances dropped dramatically -- due to much better data collection methods
- 2013 census gathered data on local level energy consumption that had previously been estimated (including those small mines)
- So overall – this points to better data, and increased transparency

So what does all this mean for China's INDC?

- To lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level by 2030
- To achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early
- To increase the share of non-fossil fuels in primary energy consumption to around 20% by 2030

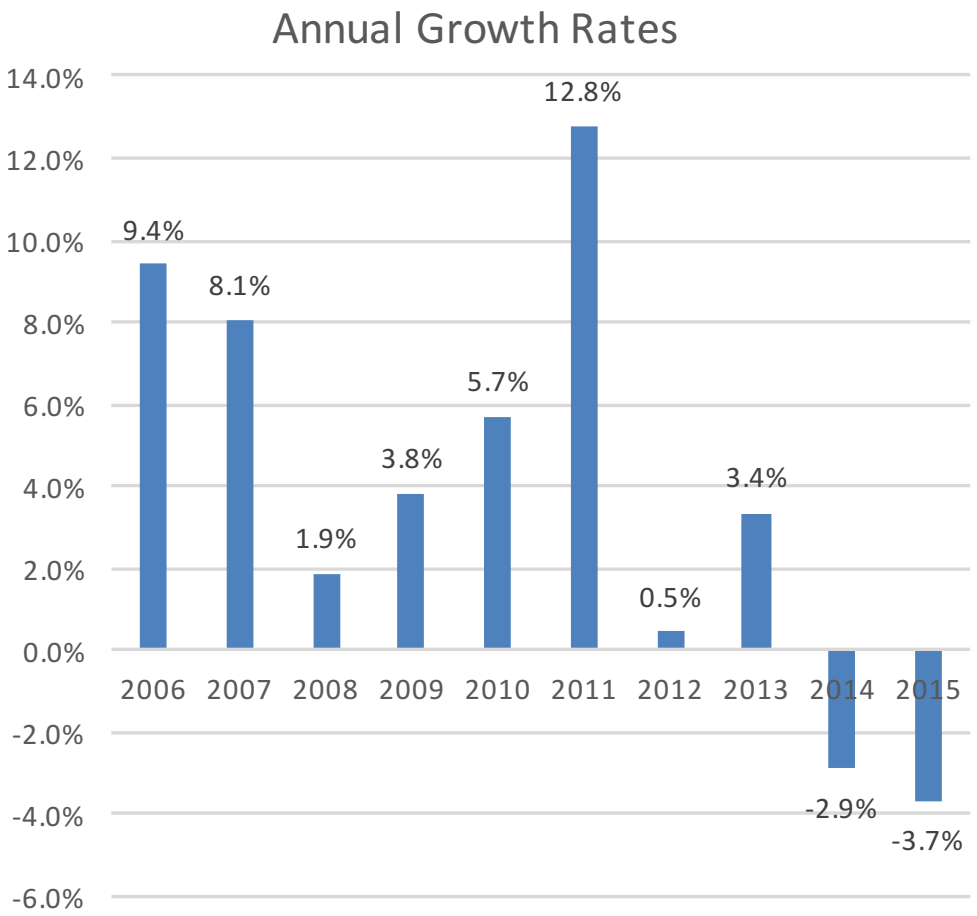
http://www4.unfccc.int/submissions/INDC/Published%20Documents/China/1/China's%20INDC%20-%20on%2030%20June%202015.pdf

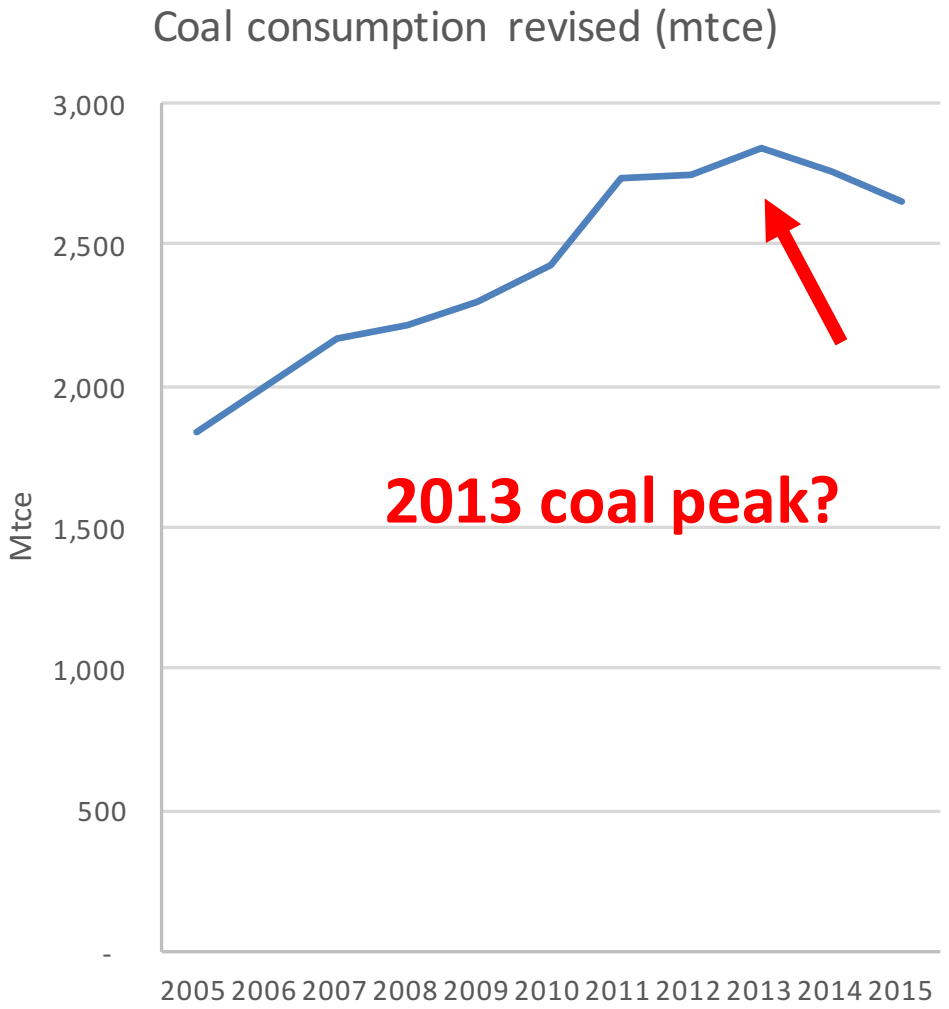
Assessing China's 12th FYP Energy intensity Target



Data from LBNL China Energy Group

Did coal already peak?





China now has a coal cap in 13th FYP
→ 5 billion metric tons of standard coal equivalent by 2020

Calculated using 2015 revised data and initial coal estimate for 2015 as reported in 2016's Statistical Communiqué

An early emissions peak?

- "China's international commitment to peak emissions 'around 2030' should be seen as a highly conservative upper limit from a government that prefers to under-promise and over-deliver" – Green & Stern
- "China's energy related CO_2 emissions are plateauing, if not already peaking" –Jiang Lin, EF
- "Like the corner pizza place saying your pie will take an hour, this deadline [2030] may overestimate the time required for delivery."

– Vice News

Understanding China's non-fossil energy targets

- China's non-fossil target is measured as a share of total primary energy
- In order to calculate the share of electricity generated by non-fossil fuels in total energy, electricity (watt-hours) must be converted into units of primary energy (e.g. joules, Btus)
- There are three internationally accepted methodologies for making this conversion… but China uses a fourth, unique method
- And this matters because depending on the methodology used, the share calculated will differ significantly

Lewis, Joanna I., David G. Fridley, Lynn K. Price, Hongyou Lu, John Romankiewicz. 2015. "Understanding China's Non-Fossil Energy Targets." *Science* 350 (6264): 1034-1036

Calculating China's non-fossil target

- Under the Chinese approach, China's 2010 share of non-fossil electricity is 8.4%, and the 2020 target is 15%
- Under the IPCC approach, China's 2010 share of non-fossil electricity is only 3.4%, and the 2020 target would be less than 8%

→ INDC doesn't use UN/IPCC convention
→ The method used is not transparent

Lewis, Joanna I., David G. Fridley, Lynn K. Price, Hongyou Lu, John Romankiewicz. 2015. "Understanding China's Non-Fossil Energy Targets." *Science* 350 (6264): 1034-1036

Renewables targets common in climate pledges

Country	Target
Antigua & Barbuda	50 MW of electricity from RE by 2030
Cape Verde	100% of electricity from RE by 2025
China	20% non-fossil energy in primary energy mx by 2030
Gambia	104 Gg CO2e from RE by 2030
Guyana	20% share of RE in total energy mix by 2025
India	increase the share of non-fossil based power generation capacity to 40% of installed electric power capacity by 2030
Lao	Share of renewable energy to 30% of energy consumption
Niue	38-80% share of RE in electricity
Samoa	100% renewable energy for electricity generation
Swaziland	Double the share of renewable energy by 2030

Data from selected INDCs, UNFCCC

Takeaways

- Paris Agreement calls for transparency but falls short of giving specific guidelines
- Creates problems in assessing comparability/level of effort across INDCs
- China (and other emerging and developing countries) still have work to do to increase transparency surrounding methodologies and uncertainties
- But recent coal revisions indicate that things are getting better, not worse. And China's forthcoming cap and trade program has led to new GHG accounting guidelines and mandatory reporting