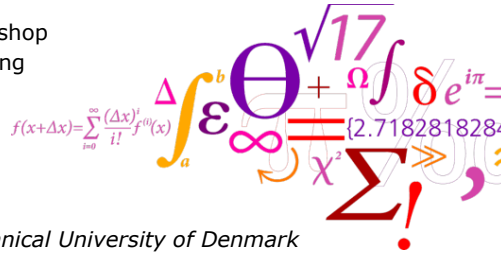


Analysing future energy system pathways of East, Central and West China in a global context with TIAM

EFDA-TIMES and ETSAP-TIAM Workshop
 64th Semi-annual IEA - ETSAP Meeting
 Seoul, Republic of Korea
 4 November 2013

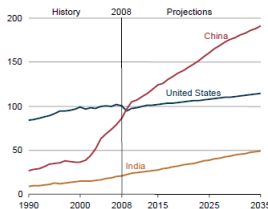


Peggy Mischke
 DTU Management Engineering, Technical University of Denmark
 Energy System Analysis
peym@dtu.dk

Added value: An improved modeling of China's regional energy characteristics and its global impacts in TIAM

- China is at the centre of an unprecedented shift in the global economy and the global energy industry. Over the past decades China has experienced fast economic growth, accompanied by rapid urbanization, increasing energy consumption, widening regional disparities and soaring green house gas emissions.
- This remarkable growth has led to twin challenges for China: (i) improving environmental sustainability and regional economic development and (ii) enhancing energy security.
- Any major effort to minimize, mitigate and adapt to the adverse effects of climate change will need to better understand and integrate China's future energy system pathways and related policy targets.

Figure 13. Energy consumption in the United States, China, and India, 1990-2035 (quadrillion Btu)

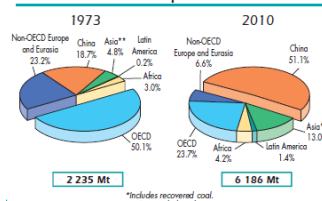


Sources:

Figure 13 from US EIA global outlook 2011 – China is the top energy consuming country

Regional shares of hard coal production, global from IEA Key World Energy statistics 2011 – China is the top hard coal producing country in 2010

1973 and 2010 regional shares of hard coal* production



The data challenge: How to deal with energy statistics full of Chinese characteristics in an international context?

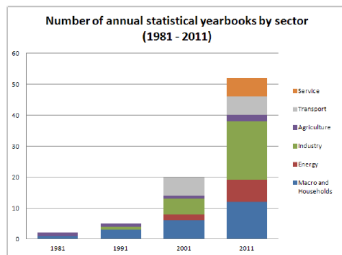
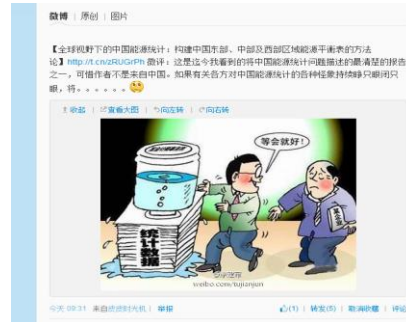


Figure 1: Increase of national statistical yearbooks in China (1981-2011)



Development of a simplified methodology to integrate selected indicators from Chinese national statistics in TIAM to distinguish energy systems for East, Central and West China – based on the IEA energy balance methodology (as used for other regions in TIAM)

Source:

Mischke, Peggy (2013): *China's energy statistics in a global context: A methodology to develop regional energy balances for East, Central and West China*. MPRA DTU Working Paper 50145; published on October 1, 2013; 44 pages; <http://mpra.ub.uni-muenchen.de/id/eprint/50305>

3

12.11.2013

Using TIAM to represent key characteristics of China's regional energy systems – Defining East, Central and West China in TIAM

- The suggested sub-regional definition of China in TIAM is based on the PRC's Seventh Five-Year Plan (1986–1990), which grouped all provincial level divisions of China into three economic zones in order to promote medium to long term economic specialization and division of labour.
 - **18 Region global model version of TIAM**, based on 15 Region global TIAM 2011 version

- China East Region:** export-oriented industries, including steel, chemicals, engineering and textiles; in 2010 about 578 million inhabitants (44% of Chinese population) lived on 13% of China's land area; currently the economic powerhouse, accounting for more than 92% of China's exports and about 97% of China's GDP in 2010
- China Central Region:** most of China's coal and metallurgical industries, as well as agricultural production; in 2010 about 440 million inhabitants (34% of Chinese population) lived on 29% of China's land area; crucial for supplying energy to the provinces in China's East Region.
- China West Region:** the least developed region; marginal share of about 1% in China's GDP in 2010; in 2010 about 293 million inhabitants (22% of Chinese population) lived on 57% of China's land area; major hydropower resources



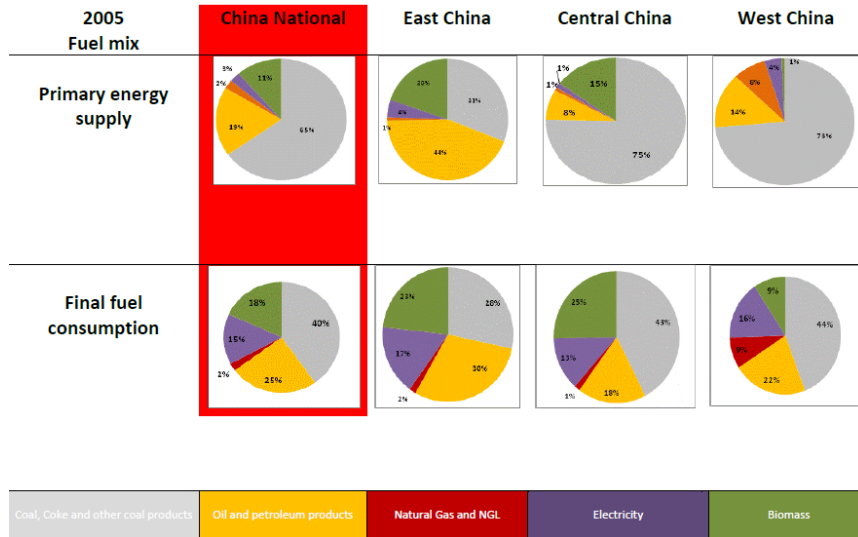
Sources:

PRC NBS Statistical Yearbook 2011; Economist 2012

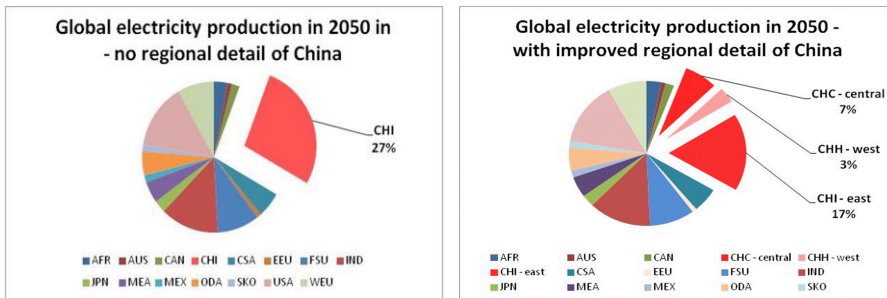
4

12.11.2013

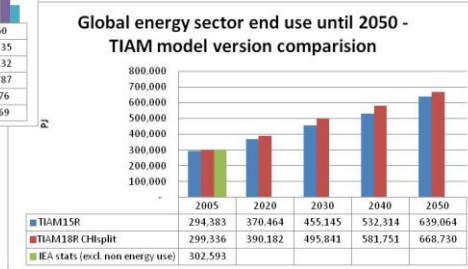
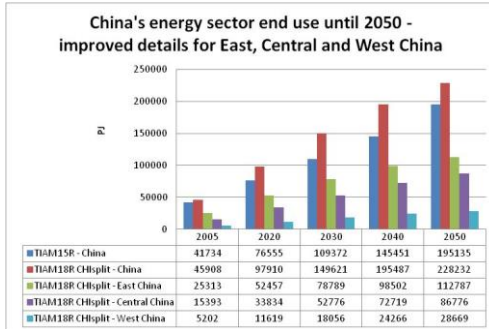
TIAM 18R base year calibration – Fuel mix for primary supply and final consumption



Insights from TIAM 18R reference scenario runs (I) Improved modelling of China's power sector



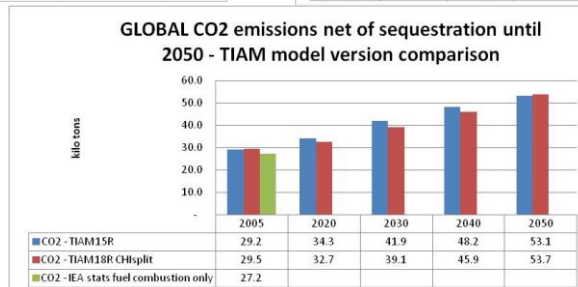
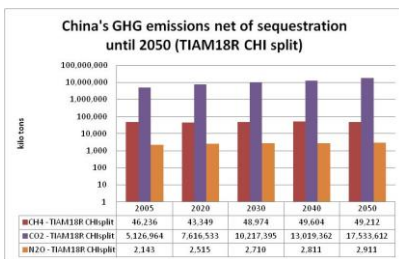
Insights from TIAM 18R reference scenario runs (II) Energy end use pathways until 2050



7

12.11.2013

Insights from TIAM 18R reference scenario runs (III) Future emission pathways until 2050



8

12.11.2013

Thank You!谢谢!
Danke! Merci bcp! Gracias!



For more information:

Email me: peym@dtu.dk

Follow my China energy blog: <http://www.peggymischke.com/china-blog.html>

Connect via LinkedIn: Peggy Mischke (佩吉·密歇克), International Energy Specialist, Copenhagen Area, Denmark



In collaboration with:



中国科学院研究生院
GRADUATE UNIVERSITY OF CHINESE ACADEMY OF SCIENCES



SDC 中日
Sino-Danish Center
www.sino-danish-center.com