

# CO2 emissions estimates of China based on multiple datasets

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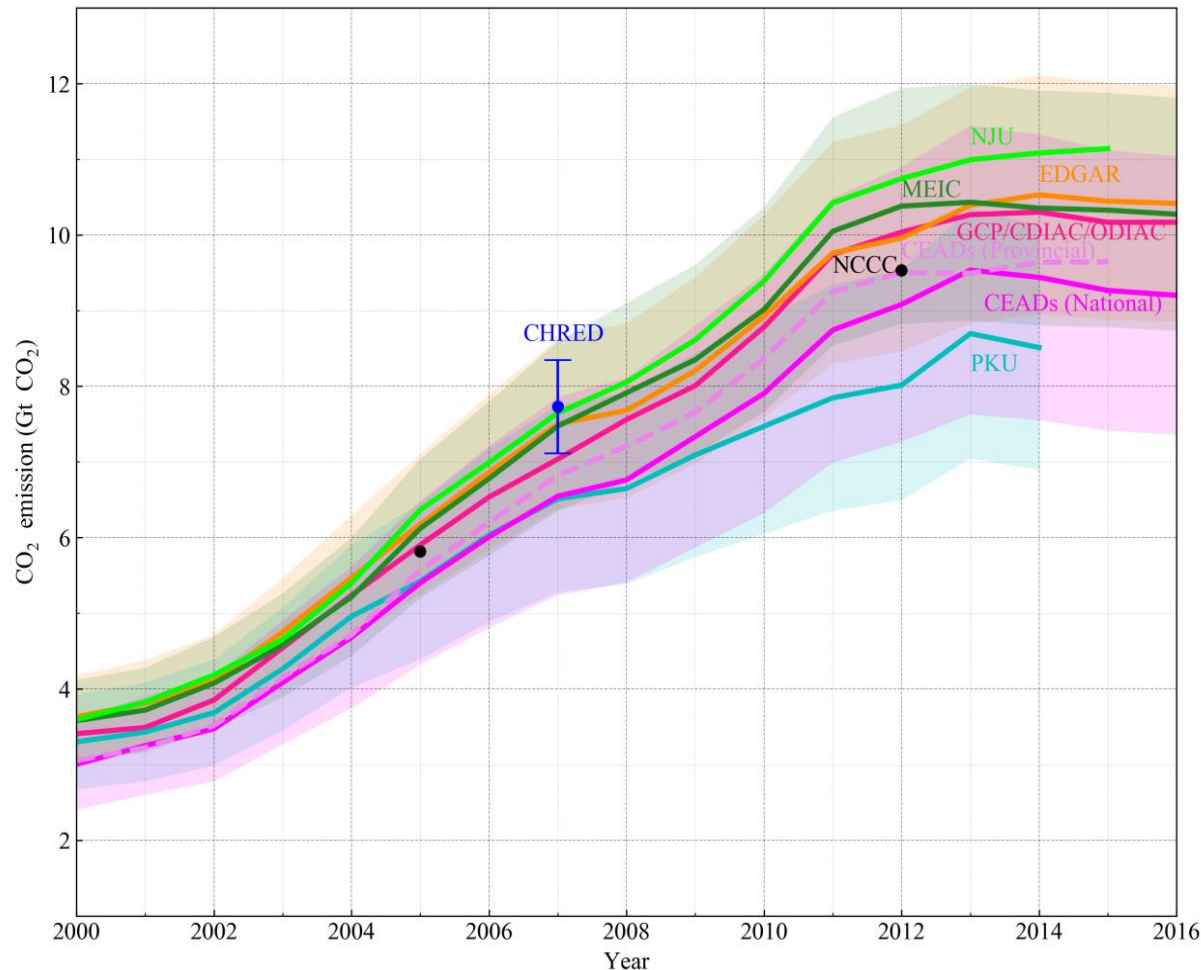
# Motivation

The screenshot shows the official website of the Chinese government. At the top, there is a navigation bar with the following links: 国务院 (State Council), 新闻 (News), 专题 (Special Topics), 政策 (Policies), 服务 (Services), 问政 (Public Questions), 数据 (Data), and 国情 (National Conditions). A search bar is located on the right side of the navigation bar. Below the navigation bar, there is a breadcrumb trail: 首页 > 新闻 > 滚动. The main content area features a large red headline: **China to peak CO2 emissions at 2030 and peak earlier**, with the Chinese translation below it: **我国碳排放2030年达峰值**. At the bottom of the page, there is a blue navigation bar with the following links: 国务院 (State Council), 总理 (Premier), 新闻 (News), 政策 (Policies), 互动 (Interaction), 服务 (Services), 数据 (Data), 国情 (National Conditions), and 国家政务服务平台 (National Government Service Platform). A small red '新' (New) icon is visible next to the last link.

**China achieved carbon intensity decrease target 3 years earlier;**  
2020 Carbon emission intensity decreased 40%~45% than 2005 level  
**我国提前3年完成碳强度下降目标**

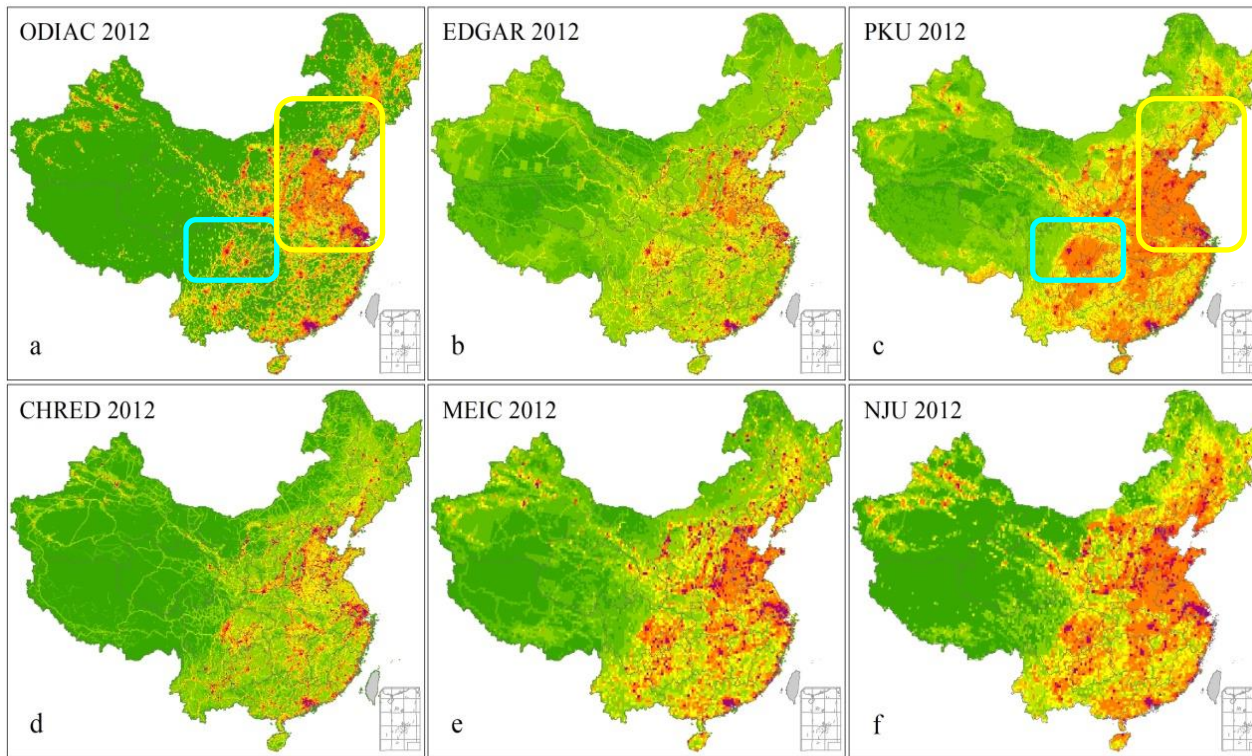
1. The Chinese government has pledged to **peak** its CO<sub>2</sub> emissions **by 2030** or earlier;
2. To **reduce** the CO<sub>2</sub> emission per unit GDP **by 60-65%** below 2005 levels.

# Total emissions for China: 2012



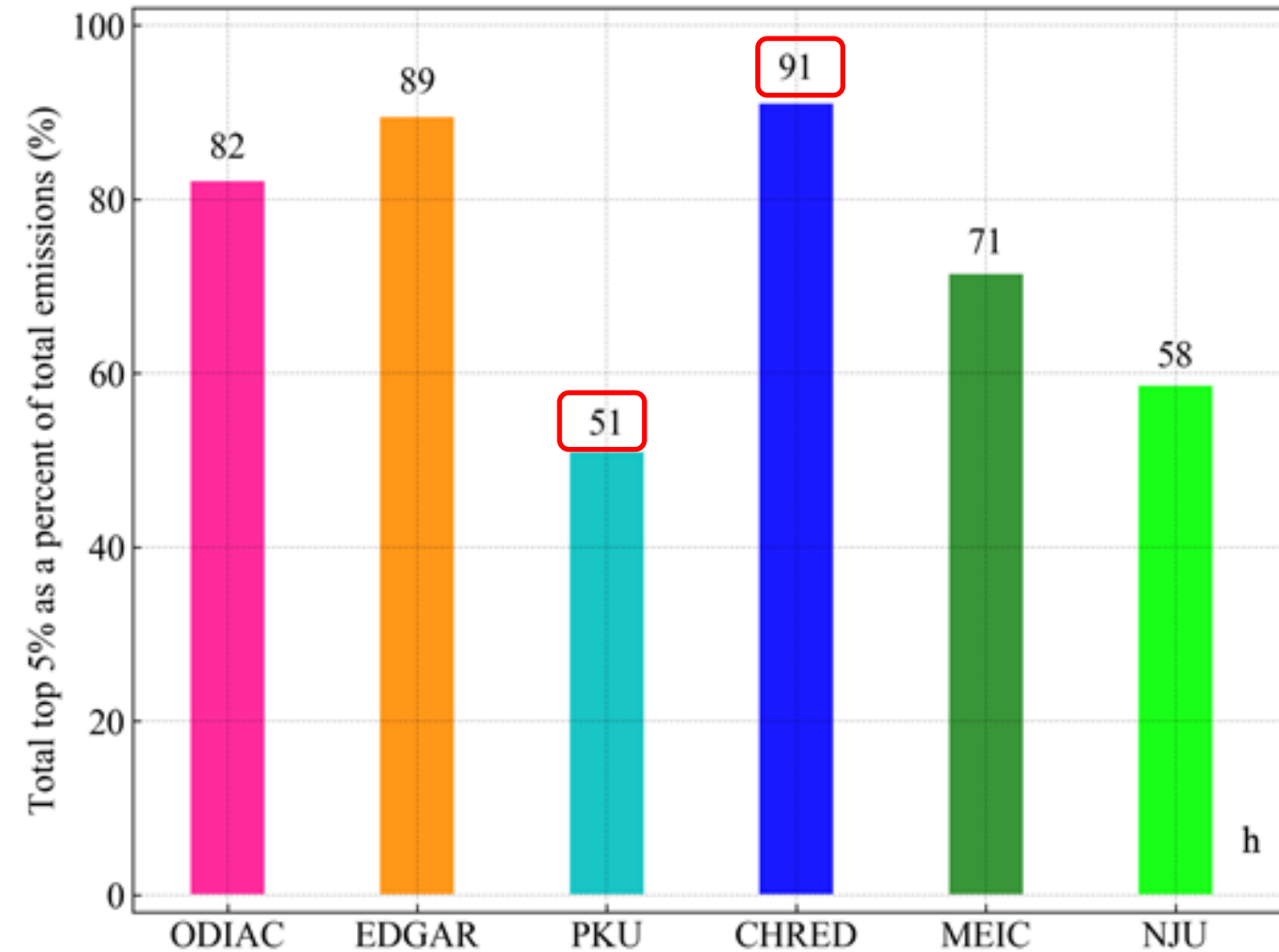
1. Magnitude: Increased from **3.4** (3.0-3.7) in 2000 to **9.8** (9.2-10.4) Gt CO<sub>2</sub> yr<sup>-1</sup> in 2016;
2. Uncertainty: **10-20% for most datasets**
3. Emissions levelled off after 2012/13

# Spatial distribution



- Spatial pattern:
- More concentrated (EDGAR, CHRED) or diffusive (PKU, NJU);
- Depend on point source emissions fractions and proxy such as population

# Results: Top 5% grid



- CHRED and EDGAR account for ~90%;
- PKU and NJU 50-60%;

# Conclusions:

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- 1) China's carbon emissions **tripled** from **3.4 to 9.8 Pg CO<sub>2</sub>** during 2000-2016, and had **a difference of 27.5%** in 2012 due mainly to the different **emission factors** they used;
- 2) The datasets show that great differences existed in high emission grids, and the **top 5% grids** account for **90%** of total emissions for EDGAR and CHRED, while it is **50-70%** for PKU, MEIC and NJU, respectively;
- 3) Emissions estimated from **provincial-level inventories were more consistent** than that from spatial disaggregation of national energy statistics.