

Quantified emissions reduction target of China
- Assessing the Chinese target of 40-45% reduction in CO₂ intensity -

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On 26 November 2009, Xie Zhenhua, Vice Minister of the National Development and Reform Commission announced the Chinese Government’s emissions reduction target of “40-45% reduction in CO₂ intensity by 2020 from 2005 level”, which received opposing reviews.

On the cons side, it was said that such a target is too low. This viewpoint is typical among policy-makers in developed countries and among the mass media in general.

The pros say the target can be highly valued. For example, the chief economist of the International Energy Agency (IEA), Fatih Birol says that “to achieve 2°C target, 3.8 billion CO₂ equivalent tonnes of reduction of global emissions from Business as usual (BAU) scenario by the year 2020 is needed. This quantified emission reduction target of China is equivalent to a reduction of about 1 billion tonnes or approximately one fourth of the above when converted to absolute emissions quantity. This is almost the same level as the total emissions quantity of 8.4 billion CO₂ equivalent tonnes that the IEA (2009) is asking China to adopt as the absolute

emission cap for 2020”. (AFP 2009)

What attributes to such totally opposing reviews?

Those criticising Chinese targets seem to base their reasons as: 1) the intensity target is no good whatsoever; 2) as it is the opening position of China in climate negotiation, it must be too low; 3) by criticizing the Chinese target, the quantified emissions reduction target of one’s own nation can stand out; and 4) it looks lower than the number in the “low-carbon scenario” (57% reduction) of the Energy Research Institute (ERI) taskforce of China’s National Reform and Development Commission (NRDC) referred to in Asuka et al. (2009). Obviously such reasoning needs more quantitative analysis.

We think that the assumption on China’s economic growth rate in the future can be considered a key factor by comparing the different results of the assessment on Chinese quantified target against the absolute emissions quantity required to achieve the 450ppm global target (Figure.1, Table 1, and Table 2) .

Figure 1. Energy-origin CO₂ emission of China under different scenarios

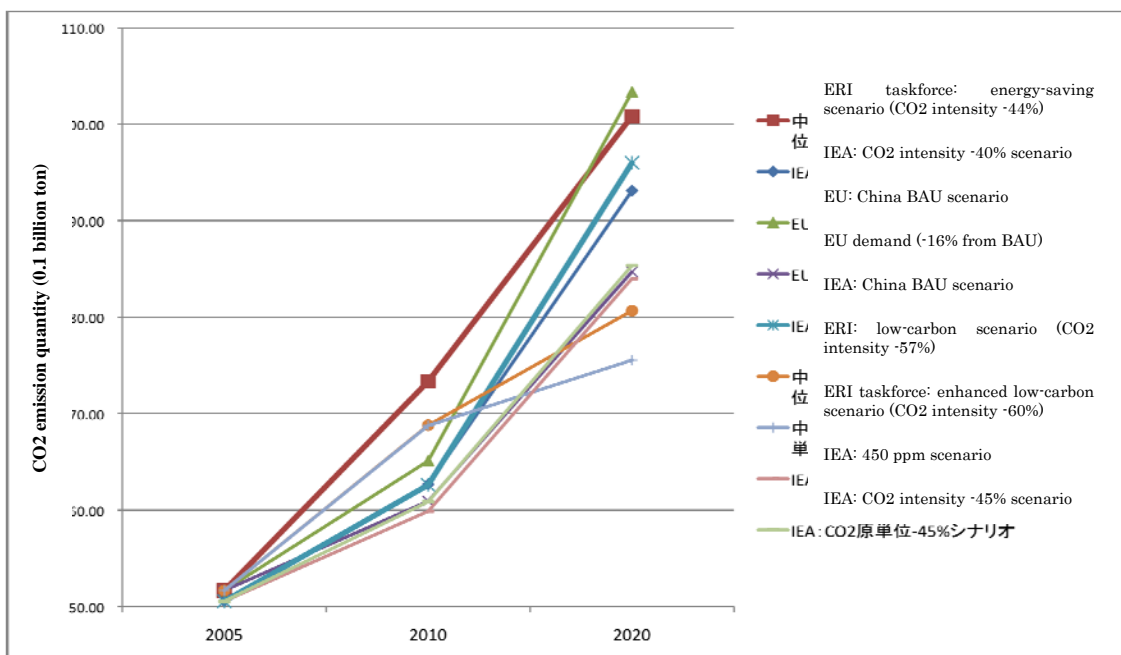


Table 1. Emissions quantities of China under different scenarios (0.1 billion tons CO₂)

Scenario	2005	2010	2020	2020, with 2005=1
ERI taskforce: Energy-saving scenario (CO ₂ intensity -44 %)	51.66	73.33	100.83	1.95
ERI taskforce: Low-carbon scenario (CO ₂ intensity -57 %)	51.66	68.79	80.67	1.56
ERI taskforce: Enhanced low-carbon scenario (CO ₂ intensity -60 %)	51.66	68.75	75.53	1.46
IEA: China BAU scenario	50.55	62.60	96.00	1.90
IEA: 450ppm scenario	50.55	59.87	84.00	1.66
IEA: CO ₂ intensity -40 % scenario	50.55	62.65	93.11	1.84
IEA: CO ₂ intensity -45 % scenario	50.55	60.86	85.35	1.69
EU: China BAU scenario	51.66	65.09	103.33	2.00
EU demand to China: (16 % reduction from BAU)	51.66	60.92	84.70	1.64

Table 2. Trend of GDP and growth rate under each scenario

Name of the research institute	2000	2005	2010	2020
GDP: ERI taskforce (0.1 billion Yuan)		183217.00	290505.00	649852.00
GDP: ERI taskforce (billion \$ 2005)		1893.40	3002.14	6715.71
ERI taskforce, with 2005=1		1.00	1.59	3.55
Average growth rate of GDP: Energy Research Institute of China (%)	10.45	9.58	9.67	8.38
GDP: IEA (billion \$ 2005)	1198.50	1893.40	2782.03	6006.19
IEA 2005=1	0.63	1.00	1.47	3.17
Average growth rate of GDP: IEA (%)		8.00	8.00	8.00

Note 1: EU's China BAU scenario was obtained on the basis of China's BAU emissions (including non-energy origin emissions) as shown in EU Commission (2009, p. 57) (6 billion tCO₂ in 2005→ 12 billion tCO₂ in 2020 under BAU), calculating energy origin CO₂ emissions to become two-fold in 2020 from 2005).

Note 2: The number reported by the ERI taskforce was obtained from "China's path for low carbon development in 2050: Energy supply and demand and analysis of CO₂ emission scenarios" by the ERI taskforce of the National Development and Reform Commission (2009), Science Press.

Under the IEA scenario that assumes a lower growth rate for China's GDP, absolute emissions quantity (8.535 billion ton CO₂) in 45 % CO₂ intensity reduction scenario approximates the value as 450 ppm scenario (8.4 billion ton CO₂). This is a similar amount to the one which the EU, in the EU Commission Staff working paper, demanded for China (-16% from BAU, EU Commission 2009), enabling them to consider the target of the Chinese Government as a very ambitious one. Under the scenario of the ERI taskforce of China, on the other hand, the absolute emissions quantity will be larger as they assume a higher GDP growth rate. According to the authors' estimate, a reduction of about 53% in CO₂ intensity will be needed to achieve the absolute emissions quantity under IEA's 450 ppm scenario. As seen here, the difference in the assumption of GDP growth rate may radically change the significance of the Chinese Government's target of "40-45% reduction in CO₂ intensity".

Nevertheless, how we assess China's quantified emission reduction target will, in the end, depend on many difficult-to-discern notions, such as the appropriateness of GDP growth rate we discussed above, rightness of perpetual economic growth and population increase (which is a factor of economic growth), and how to define BAU which has fundamental problems such as the existence of the perverse incentive to have a less ambitious domestic target.

Unlike the case of comparison between quantified emissions reduction targets of developed countries which have similar socio-economic conditions to some extents, it is much harder to evaluate the

quantified targets of developing countries, whose national situation is drastically different from developed countries in terms of per capita emissions quantity and population increase. It is inevitable that value judgment seep in, and we must be fully aware of this fact.

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