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Editorial

Sustainable Mobility in China from a Global Perspective

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READING THE NEWLY PUBLISHED Synthesis Report (SYR) on Climate Change 2014 by the Intergovernmental Panel on Climate Change (IPCC, 2015), it becomes clear that there is increasing scientific evidence of anthropogenic impact, i.e. influence of human activities, on global climate change. Of particular concern are the continued increases of CO_2 emissions and CO_2 concentration in the atmosphere. The SYR notes that 'CO_2 concentrations are increasing at the fastest observed decadal rate of change (2.0 ± 0.1 ppm/yr) for 2002–2011' (ibid.: 44). This reflects our summary of the changes of CO_2 concentrations using previous IPCC and IEA data (Zhang and Yazdani, 2014). The magnitude of annual CO_2 emissions was 30.3 gigatonnes in 2010 and the level of CO_2 concentration reached 400 parts per million (ppm) in 2013 (IEA, 2012; IPCC, 2013). Over the period of 23 years between 1990 and 2013 the level of CO_2 concentration rose from 353 ppm to 400 ppm giving it an average annual increase of 2.04 ppm/yr. If this trend remains unchanged CO_2 concentration will by circa 2037 have reached the level of 450 ppm which is the baseline of CO_2 concentration stabilisation used by many researchers for modelling global climate change. The IPCC experts estimate with high confidence that about 50% of the cumulative CO_2 emissions generated by human activities during the industrial period between 1750 and 2011 occurred in the last 40 years (IPCC, 2015: 45). Indeed, in the last 30 years or so the world has witnessed marked changes in the contributions of CO_2 emissions by some leading nations. As the leading industrialised country the US had been the largest CO_2 emission contributor until 2007, when it was overtaken by China. In 1980 the US contributed 25.8% of the 18.0 gigatonnes of world CO_2 emissions. In comparison, in the same year China's contribution of CO_2 emissions accounted for only 7.9% as shown in Table 1 (IEA, 2012).

Table 1 CO_2 emissions from selected countries/regions 1980–2010 (million tonnes)
Source: IEA, 2012

	1980		1990		2000		2010	
	Total	**%**	**Total**	**%**	**Total**	**%**	**Total**	**%**
China	1,420	7.9	2,244	10.7	3,077	13.1	7,259	24.0
USA	4,662	25.8	4,869	23.2	5,698	24.2	5,369	17.7
EU27	n/a	n/a	4,050	19.3	3,831	16.3	3,660	12.1
World	18,042	100	20,974	100	23,509	100	30,276	100

In 1990 the total world CO_2 emissions rose to 21.0 gigatonnes, of which the US contributed 23.2% and China 10.7%. EU15, a collective body of 15 European countries before 2004, contributed 19.3% in 1990. The following two decades saw three clear trends emerging: (1) continued reduction of CO_2 emissions in the EU15 then and now EU27; (2) slightly fluctuating with overall decrease of CO_2 emissions in the US; and (3) significant increase of CO_2 emissions in China. As a result, reduction of CO_2 emissions in China has become a priority in the national policy agenda, as Zhao, Hao and Zhang argue in the Guest Editorial of this Special Issue.

The global transport sector in general is the second largest contributor to total CO_2 emissions. In EU27 countries CO_2 emissions from the transport sector accounted for 24.3% in 2012, below that from the energy sector at 29.2% (European Commission, 2012). Particularly important is the annual change of CO_2 emissions over the 1990 level. Categorically all sectors (including energy, industry, residential and commercial) but transport have seen to various degrees reduction in CO_2 emissions from 1990 to 2012 (ibid.). This pattern was formed in the context of stabilisation of vehicle ownership of 567 vehicles per 1,000 people in EU27 in 2010 (Ward's, 2013). In stark contrast, vehicle ownership in China was merely 58 vehicles per 1,000 people in 2010. As a result, CO_2 emissions from China's transport sector accounted for only 7.5% of the total 7,259 million tonnes in 2010, far below the world average 22.3% and the significantly higher rate of 30.2% registered for the US as shown in Table 2.

Table 2 CO_2 emissions from the transport sector in selected countries/regions 2010 (million tonnes)
Source: IEA, 2012

	Total (A)	%	Transport (B)	% (B/A)	Road transport (C)	% (C/B)
China	7,259	24.0	546	7.5	401	73.4
US	5,369	17.7	1,621	30.2	1,401	86.4
EU27	3,660	12.1	900	24.6	848	94.2
World	30,276	100.0	6,756	22.3	4,972	73.6

The development of China's transport systems in general and the road transport system in particular, with its large potential contribution to CO_2 emissions in the coming two decades or so, i.e. 2015–2035, demands a special forum of investigation and discussion, and therefore the resultant presentation of this Special Issue (SI) dedicated to the subject. I thank the Guest Editors, Professor Fuquan Zhao and Dr Han Hao from Tsinghua University for their effort and commitment to collecting and editing the papers included in this SI. The contributions to the SI provide a wide range of topics with in-depth analysis of the complex transport systems in China. I hope that the findings from this SI will shed light on our debate and examination of sustainable mobility with special reference to large developing countries.

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