

China's industrial revolution is happening on a new planet

September 19 2013, by Tong Wu



China's industrialisation has followed the same path, but the rules of the game have changed. Credit: Jonathan Kos-Read

What can two periods of industrialisation nearly two centuries apart tell us about how economies change and the demands their change place on the planet?

Today, China leads the wave of emerging economies poised to recast the Western-dominated geopolitical balance. Its development over the past

three decades has turned it from a rural backwater – the "Sick Man of the Orient" – into the world's second largest economy. According to the Peterson Institute's Arvind Subramanian, China will soon displace the US as the dominant economic power in the world, wielding a global influence even greater than that of the British Empire at its height.

But China's economic ascendancy has been purchased at a high environmental cost. Degraded ecosystems, polluted waterways, and encroaching deserts – these are the malignant byproducts of the largest economic expansion in history. The British historian Niall Ferguson has said that China seems intent on "cramming a century's worth of industrialisation and urbanisation into about 30 years". This sounds dramatic, but Professor Ferguson's assessment may be an understatement. According to a recent report by the McKinsey Global Institute, China's industrialisation has proceeded at ten-times the speed and 100-times the scale of Britain's.

Nonetheless, Britain still provides the archetypal example of the industrialisation experience, if only because it was the first. The world was fundamentally changed when James Watt, along with fellow inventors and entrepreneurs such as James Hargreaves and Richard Arkwright, pioneered the technologies that catalysed the great burst of productivity we now call the Industrial Revolution. By 1829, the Victorian social critic Thomas Carlyle had already proclaimed the dawn of the "Age of Machinery".

"Hell is a city much like London – a populous and a smoky city," wrote the poet Shelley during Britain's early industrial period. Fellow Romantic poet William Blake despaired that "dark Satanic mills" were blighting the landscapes of his beloved Albion. What Shelley and Blake lamented, and later scholars and commentators continued to document in rigorous detail, was the progressive despoliation of the natural world and the rise of urban civilisation.

Manchester transformed from a picturesque market town into Europe's industrial heartland. There are remarkable parallels in modern China. Take Shenzhen, a middling city of barely 300,000 people in 1980. Today, it is a metropolis of more than ten million, a neon-lit, concrete-and-steel microcosm of China's broader economic gains.

But there is an important difference between the two periods of industrialisation. In a much-cited 2009 paper in the journal *Nature*, a group of environmental scientists advanced the concept of a "safe operating space for humanity". Key planetary limits are being transgressed and the room for collective human error is shrinking. When Britain began its industrial ascent, the atmospheric concentration of carbon dioxide was approximately 280 parts per million (ppm). Today, it is about 400 ppm. Earth's ability to absorb effluence and yield resources has declined significantly.

Thus, the environment in which China, India, and other [emerging economies](#) now pursue growth is fundamentally different. The natural world can no longer be taken for granted as a backdrop against which industrial activity takes place. The growing pressure to cap China's emissions during international climate negotiations highlights the new reality.

However, with average incomes still a fraction of those in the developed West, China is unlikely to acquiesce. The West grew their industrial economies with environmental impunity, the emerging countries grumble, but now that it is their turn, the rules have changed. But even if geopolitics are negotiable, planetary boundaries are not. It is clear that the current wave of industrialisation must find a new, more environmentally-amenable paradigm.

In recent years, China's concerted efforts at low-carbon development – highlighted by world-leading investments in renewable energy,

government-mandated decreases in energy intensity, and large-scale afforestation – offer great promise, even if [major challenges remain](#).

"It was the best of times, it was the worst of times," Charles Dickens' *A Tale of Two Cities* famously begins. Even if it is not the best of times, it is still hard to begrudge the social achievements of China's development – nearly 630 million people were lifted out of poverty between 1981 and 2005.

But the environmental consequences of that growth are becoming unavoidably manifest, in ways with which the Britain of Dickens' time did not have to contend. Reconciling the social and the environmental sides of growth is the paramount challenge for modern China. Should it succeed, it could represent the archetype of a new paradigm of development, one that is not only industrial but also sustainable.

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