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CHAPTER 3

ECOMODERNIZATION – WITH 'CHINESE CHARACTERISTICS'

Intensifying many human activities – particularly farming, energy extraction, forestry, and settlement – so that they use less land and interfere less with the natural world is the key to decoupling human development from environmental impacts. These socioeconomic and technological processes are central to economic modernization and environmental protection.

AN ECOMODERNIST MANIFESTO, 2015

The process that dominates our world today is the rise of China and India as serious industrial powers. Whereas the Rise of the West enhanced the wealth and income of around 1 billion of the world's population, leaving the rest in poverty, the current Rise of the Rest that we are living through promises to raise several billion more into the ranks of the middle class, making industrialization and modernization the property of the world as a whole. This is indeed a *Great Transformation* of our global industrial system.

As the scale of global industrial production increases, and with it the scale of our civilization's burning of fossil fuels and plundering of resources, so we come up against the limits of that burning and plundering mode of economic behaviour. The limits are not just felt in terms of resource limits (will the world depart the oil age for want of oil?) but in terms of more immediate geopolitical limits, with nations contesting the increasingly precious fuels and resources needed to sustain their industrial systems. If the twentieth century was a century of oil wars, the twenty-first century promises to be even worse – unless something is done to change the 'Business as usual' paradigm.¹

1. On oil wars and the 'race for resources' see Klare (2012). An earlier treatment was provided by Rutledge (2006).

That change is indeed coming – but not from the West itself, given its ‘carbon lock-in’ that ensures priority is given to coal, oil and gas as well as to behaviour based on assumptions of unlimited resource throughput and waste generation.² Instead it is coming from the ‘Rest’ – in this case led by China – because it is in the Rest that pollution is felt most acutely and geopolitical pressures are experienced most severely. It is China and India that are experiencing pressures from resource-import dependence, and so are transforming their industrial models most radically, leading them to become renewable energy superpowers and progenitors of a new Circular Economy in place of the conventional Western linear economy. They are doing so by exploiting their latecomer status and converging on the West, emulating companies like Tesla that are leading the field as exemplars and sources of ideas and technology.³

It is the combination of industrialization (rise of manufacturing as principal source of wealth and income) with a green economy, made imperative through considerations of energy security and resource security, that we may call *Ecomodernization*. It may be viewed as the world’s leading ideology that makes sense of the Great Transformation under way. And because the change is led by China, we may truly call this a process of ‘Ecomodernization with Chinese Characteristics’.

ECOLOGICAL MODERNIZATION

Ecological modernization is a body of ideas that goes back to debates in Western sociology of the 1980s, when scholars advanced the proposition that economy and ecology could be reconciled.⁴ This was a radical departure at a time when the twin worlds of economic development and ecological sustainability had little to do with each other.

While the ideas of ecological modernization (ecomodernism) continued to exercise influence in the West, it is in the East that they have become dominant and transformative. China, experiencing the fastest and most profound industrial transformation in history, and also experiencing the worst levels of

2. See Unruh (2002) for the original exposition of carbon lock-in, which refers to the battery of techno-institutional systems that bias Western economic activity towards continued use of fossil fuels.

3. Tesla took the radical step in 2015 of releasing its patents, inviting small and medium sized companies to make use of its patented technology in order to grow the EV industry.

4. There is a broad literature on ecological modernization; for a representative sample of writing, see the collection edited by Mol and Sonnenfeld (2000).

pollution ever encountered, as well as rising levels of dependence on resource and fossil fuel imports, reacted by adopting a national goal of an ‘ecological civilization’. While a clumsy phrase, this was interpreted in sharp terms as placing ecological goals on a par with those of economic growth. In the Chinese system this meant that career paths of provincial officials would be determined not just by their contribution to economic growth but also by their achievements in cleaning up the environment.

The Chinese have as yet produced no commanding literature underpinning their conversion to the tenets of ‘ecological civilization’. Instead it is a group of largely Western scholars, for example those grouped around the Breakthrough Institute in California, who have produced a document that succinctly captures the essential features of ecological modernization.⁵ Just as Martin Luther defined the terms of the Protestant Reformation in 1517 when he nailed his 95 Theses to the door of the All Saints Church in Wittenberg (directed largely at condemning papal indulgences) so we find something comparable happening today. The Breakthrough Institute has nailed its Manifesto with 71 Theses arranged in 7 chapters to the ‘door’ of the Internet, promising to launch a revolution within environmentalism and capitalism. Its fundamental (unspoken) thesis is that the two are compatible.

DECOUPLING

The idea of *decoupling* is what drives the whole enterprise. Thesis 18 of the Manifesto introduces decoupling as implying that ‘human environmental impacts rise at a slower rate than overall economic growth. Thus, for each unit of economic output that is added, less environmental impact (e.g., deforestation, defaunation, pollution) results. Overall impacts may still increase, just at a slower rate than would otherwise be the case’ (p. 11). This concept of decoupling is then clarified as ‘relative decoupling’; an alternative, more profound notion of ‘absolute decoupling’ is introduced to imply that resource usage/consumption is actually declining in absolute terms.

It is with this notion of decoupling that I wish to begin my own reflections on this topic, because it is clearly the driver of ecological modernization and the key to understanding China’s (and following China, India’s) next Great Transformation. We are interested fundamentally in how an economy’s resource consumption/

5. See the *Ecomodernist Manifesto* (Asafu-Adjaye et al. 2015) with 14 authors, available at: <http://www.ecomodernism.org/manifesto-english/>.

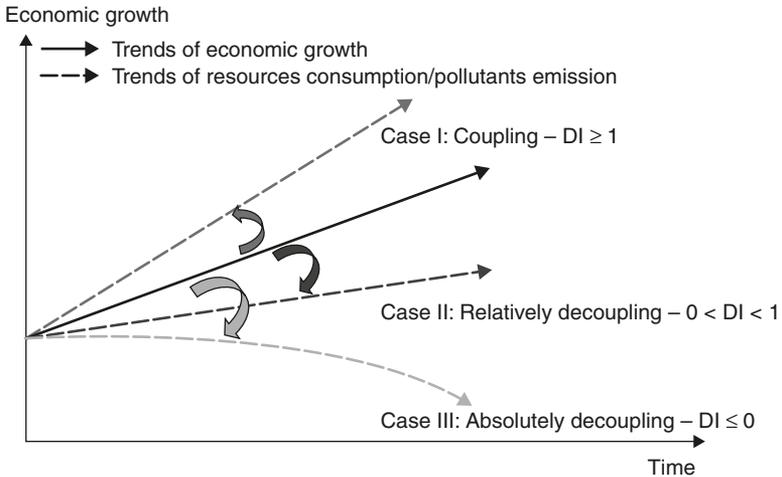
usage changes with the economy's growth. The more tightly the resource consumption follows economic growth, the more the economy is said to be coupled to its resource throughput. The goal is to become decoupled.

We can be precise about this. Let us define a *Decoupling Index* as the rate of change of resources used per unit rate of change in the economy. Normally this index will have a value exceeding 1 – meaning that the resources consumed will increase faster than the economy grows. This is otherwise known as 'Business as usual' – and it is what spells ruin for an economy like China's because of the increasing geopolitical pressures experienced as it tries to keep running on the resource throughput treadmill. It also spells ruin for the planet if that resource footprint keeps on getting larger. If an economy's resource usage/consumption increases just as fast as the economy is growing, then it is said to have a Decoupling Index equal to 1 – an important tipping point. When the Decoupling Index falls below 1 (but is still positive) this is a situation known as relative decoupling. This is the situation reached in many OECD countries, where falling resource intensities mean that the countries consume less and less resources to achieve a given level of economic growth. For China the achievement of relative decoupling is a pre-eminent goal, measured assiduously in its Five Year Plans (FYPs) with their national targets for resource intensity reduction and energy intensity reduction. Finally, if the Decoupling Index actually falls into negative territory, then this means that the economy consumes fewer resources as it grows – a situation known as absolute decoupling. No major country has reached this situation as yet. But it is the end goal of any green growth strategy.

The Decoupling Index is introduced in the important UNEP/IRP report of 2011 on *Decoupling Natural Resource Use and Environmental Impacts from Economic Growth*. The report provides a useful chart that explicates the shift in the Decoupling Index very clearly (Figure 3.1).

Although they are rarely mentioned in the same breath in the literature, the Circular Economy as promoted by China is in fact an excellent example of a state-driven material decoupling without sacrificing economic growth.⁶

6. An important exception is the 2014 report from the International Resource Panel/UNEP, on *Decoupling Natural Resource Use and Environmental Impacts from Economic Growth*, which has a chapter on China and the Circular Economy. This report's lead author is Professor Marina Fischer-Kowalski, from the Institute of Social Ecology at Alpen-Adria University, Austria, and with contributing authors including Ernst Ulrich von Weizsäcker (chair of the Decoupling Working group), Yuichi Moriguchi, Fridolin Krausmann and others. See: http://www.unep.org/resourcepanel/decoupling/files/pdf/Decoupling_Report_English.pdf.

FIGURE 3.1. The Decoupling Index and economic growth.

SOURCE: UNEP/IRP report *Decoupling Natural Resource Use and Environmental Impacts from Economic Growth*, Fig. 8-2.

The Circular Economy thus qualifies as a case of relative decoupling. The drive indicated by China's strong commitment to the Circular Economy is precisely the drive to reduce its resource intensity – and this is indeed a central measure in its newly introduced Circular Economy Index, introduced by China's National Bureau of Statistics (NBS) in 2015. Hao Tan and I argued in our article published in *Nature* in March 2016 that China is seeking through its Circular Economy initiatives to reduce its resource intensity, without sacrificing economic growth. This is what is arguably enhancing the resource security of a huge country like China.

My contribution in this text is to insist on the close links between the notion of decoupling and that of the Circular Economy. Usually these are discussed separately – and yet in reality they are tightly linked – or 'coupled' (to make a poor pun). Analysts like Walter Stahel, who published the first papers on the Circular Economy (then called the closed-loop economy) emphasize dematerialization and the extended use of artefacts, stretching to the hiring of products by the hour or the day rather than their purchase and ownership. This is one line of development of the concept. Another emphasizes decoupling and dematerialization, in an effort to reduce the global material intensity of economies like China.

In the spirit of decoupling, ecomodernization is concerned with raising resource productivity (getting more out of resource consumption per unit economic activity) and energy productivity – or equally so in the converse, in reducing resource intensity and energy intensity. The OECD countries have already made considerable progress in these endeavours – but the real issue for the world is whether China and India can make comparable progress at their vastly greater scales of activity.

The good news is that they are indeed making progress. I shall be focusing in this text on the fundamental processes that are driving everything else – the transformations in the energy system, resources regeneration (circular economy), and food production and water. In each case, we can identify the technoeconomic processes that are providing a substitute ‘decoupled’ process. The chapters on energy and materials circular flow and new enclosed methods of food production will provide the details. In the next chapter I wish to outline what these processes have in common, and what makes them so interesting as drivers of change.