

THE SIXTH WAVE OF INNOVATION

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The Russian economist Nikolai D Kondratiev put forth the theory of long-term business cycles which occur every 30–35 years. Capitalism innovates and evolves through this process of long-term cycles. Later, when western economists picked up this idea, these cycles were christened as 'Kondratiev Cycles.' Even though these cycles occur mainly due to technological innovation, Kondratiev himself did not give much emphasis to it. Kondratiev was shot dead by Stalin's firing squads in 1938 as part of the 'Purge.' But his ideas were revived and elaborated upon by the famous Austrian-American economist Joseph Schumpeter, who associated long-term cycles with major technological innovations. Schumpeter spoke of the 'creative destruction' of the old to renew capitalism through innovation. Kondratiev cycles thus came to be associated with major technological changes. The five major historical cycles of innovation listed by Kondratiev scholars are: the early mechanisation cycle since the 1770s, the steam power and railway cycle since the 1830s, the electrical and heavy engineering cycle since the 1880s, the Fordist and mass production cycle since the 1930s, and the information and communication cycle since the 1980s.

The book under review here talks about the dawn of a new Kondratiev cycle through a new, green technological revolution. The basic argument in the book is that the world has no option but to move on to a new green economy and it goes on to point out the ways and means of doing so. The new cycle will be green. A new green industrial revolution has begun to unfold with green energy, energy efficiency, and resource efficiency at its core. The authors discover that the three essential ingredients required for the new cycle are present now: the loss of magnetism of the technologies like information technology that characterised the former cycle, gradually emerging demand for new products and services which will become strong in the near future, and the invention and development of exciting new technologies (as is happening in the case of renewable energy technologies). The authors call this the Green Kondratiev cycle or the 'Sixth Wave of innovation.'

One of the distinctive features of this new cycle is that unlike the previous ones, here, resource productivity grows faster than labour productivity. The focus in this book is on increasing resource productivity—doing more with less. In that sense, the book is a sequel to 'Factor Four' which was originally conceived as a report to the Club of Rome and then published in 1998 as a book. 'Factor Four' was a relook at the Club of Rome's position on 'Limits to



FACTOR FIVE

Weizsacker, Hargroves, Smith,
Desha, Stasinopoulos
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Growth.' Instead of absolute limits, the emphasis in that book was in providing evidence from across many of the major resource consuming sectors that significant reductions in resource consumption could be achieved while increasing wealth. Factor Five carries this idea forward. In both books, the principal author—Ernst Von Weizsacker—remains the same. The five chapters in the first part of the book contain sectoral research studies of resource utilisation, done from a systems perspective under the now famous 'The Natural Edge Project.' The six chapters in Part II are an update on Weizsacker's work on policy prerequisites, first published in 'Factor Four.'

The sector studies cover all the heavy resource consuming sectors like buildings, heavy industry, agriculture and transport. The policy prescriptions in Part II range from regulation, economic instruments to promote environmental sustainability, efficiency and renewable energy, ecological tax reform, etc. The highlight of the book is the whole systems approach to resource productivity. Whole systems thinking can be defined as a "process through which the interconnections between systems are actively considered, and solutions are sought that address multiple problems at the same time." Hence it is an antidote to the myopic dystopian visions of a dark future for human civilisation in the post-fossil fuel world. Nevertheless, the approach is realistic in the sense that the authors point out that sustainability and unlimited growth and consumption do not go hand-in-hand.

Resource productivity is a means of ensuring sustainability of development, and not perpetuating energy or economic profligacy. That is why the book ends with a section on "sufficiency in a civilised world." The following quote from the book will make its position very clear: "Growth is widely seen as the basis for jobs at least in the consumer goods, tourist and construction industries. However, in its current form it is a significant driver for a deteriorating climate, destruction of more and more natural habitats, and resource depletion. It is exactly what is not sustainable for a world of seven or more billion humans. Even with significant productivity gains the world cannot fulfill all such dreams of consumption and pleasures for an ever-growing world population. Our civilizations worldwide have to face sufficiency, or some limits to greed, growth and consumption. The political art will be to make this process satisfying for most sides. We assume that high-quality life and satisfaction based on the two pillars of efficiency and sufficiency can be achieved even for a world of seven or more billion people."