Recycling everything the key to saving the planet: book

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Recycling all the materials we use is the key to saving the Earth and humans from an apocalyptic future, according to a major new book by scientists at the University of East Anglia (UEA).

With the planet facing a rare upheaval in its long history, leading environmental scientists Tim Lenton and Andrew Watson have developed a new vision of the future that could safeguard the Earth and its species, and addresses the issues of a growing global population, human consumption, energy supply, climate change and pollution.

Key to reaching this vision, unveiled in Revolutions that Made the Earth published today by Oxford University Press, is learning the lessons from past upheavals of the Earth system: future societies must recycle all materials they want to use with almost 100 per cent efficiency and be fuelled from sustainable energy sources.

The authors argue that human civilisations should emulate the biosphere and construct what they call 'Gaia devices' - named after the Gaia theory of Earth as a self-regulating system - that recycle materials and their waste products far more efficiently than we are currently doing. Some of these devices will be more organic than man-made, for example highly recycling agricultural eco-systems, but they will all carry an element of human design. A combination of solar and nuclear power could provide the sustainable energy sources to drive these future societies and their Gaia devices.

In the manufactured environment, for example, human use of metals mined out of the Earth's crust and used for technology and construction would shift increasingly towards recycling. The Gaia devices in this case would literally be machines. With a perfect recycling system mining of some metal ores could stop, and cities with their stockpiles of metals - in the form of manufactured goods and scrap heaps, will become the mines of the future.

"We need to maximise recycling of all the materials we use to build and grow things, which together with the appropriate energy source is the secret for a sustainable future with a relatively high population," said Prof Lenton, professor in Earth system science. "In principle, as long as humans have an abundant source of energy we ought to be able to increase our standard of living and avoid the problems of accumulating waste products by greatly increasing the efficiency of recycling."

Revolutions that Made the Earth is the culmination of six years' work and offers a new historical perspective on how we came to be here, placing humanity in context as part of the Earth system. It charts how the Earth that sustains us today was born out of a few remarkable, near-catastrophic revolutions, started by biological evolution and innovation, and marked by global environmental consequences. The authors show the fundamental interdependence of the evolution of life and its non-living environment, arguing that we would not exist unless these upheavals had led eventually to 'successful' outcomes; that is, a new stable world emerging.

The current planet-reshaping activities of our species may be the start of another great Earth system revolution, but there is no guarantee that this one will be successful. Prof Lenton and Prof Watson, of the School of Environmental Sciences, present their vision of the future as an alternative to those of an apocalypse resulting in an uninhabitable planet and dangerous climate change, or a 'retreat' into a lower energy, lower material consumption, and ultimately lower population world.

Prof Watson, Royal Society Research Professor, said they had taken a different approach to offer solutions, using careful analysis of similar change in the deep past and our rapidly maturing

knowledge of the Earth system.

He added: "Our alternative vision of the future is of a new revolution, into a high energy, high recycling world that can support billions of people as part of a thriving and sustainable biosphere. Rather than retreat in a last ditch attempt to minimize our impacts, our best hope now is to embrace revolution and intervene with more intelligence in the Earth system, to close the recycling loops we have opened, and restore stability. In contrast to previous upheavals we have foresight - we know what harm we may do and how we can prevent it."

More information: Details about Revolutions that Made the Earth can be found at the Oxford University Press website: ukcatalogue.oup.com/product/9780199587049.do

Provided by University of East Anglia