





The renewable energies technology surge: A new techno-economic paradigm in the making?

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<https://doi.org/10.1016/j.futures.2012.12.001> 

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Abstract

Despite discussion of a ‘carbon lock-in’ and techno-institutional barriers to change, energy studies have had little serious contact with neo-Schumpeterian theorizing on technological ‘surges’ of creative destruction, which have characterized the entire industrial era from the 1770s on. In this paper a way is offered to link the current surge in renewable energy investment to the theorizing over long (Kondratiev) waves and techno-economic paradigm shifts. The paper argues that the current renewable energy surge can be best comprehended as a secondary surge in the fifth long K-wave, coinciding with the shift from gestation to installation of a new sixth techno-economic paradigm within the matrix of the fifth. It is argued that this emergent 6th paradigm is a continuation and fulfilment of the 5th, where IT and ICT are applied to the electric power grid, and that both are in conflict with the still-incumbent 4th paradigm based on fossil fuels and centralized power generation. The emergent 6th paradigm is driven by the technology surge associated with renewable energies, particularly in China where the investment is most intense and the falling costs are driving market expansion. It portends a renewable energy speculative financial boom and bubble which could burst sometime in the period 2015–2020, ushering in a period of sustained development of renewables and energy-efficiency services by productive rather than financial capital.

Highlights

► The shift to renewable energies (REs) is an incipient 6th TEP shift. ► It will coincide with a financial bubble that could burst around 2015–2020. ► The 5th TEP based on ICTs finds its continuation and fulfilment in the application of IT to the power grid and RE systems. ► The success of the shift to REs depends on dismantling the systemic supports for fossil fuel systems.



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Keywords

Renewable energies; Techno-economic paradigm; Sixth techno-economic paradigm shift; Neo-Schumpeterian dynamics; Creative destruction; Carbon lock-in

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