

WiFi Meet FuFi: Disruptive Innovation in Logistics Catalysed by Energy

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ABSTRACT

Cost of energy per unit of goods or services is likely to evolve as a key differentiator of economic growth. The debt of nations will be re-structured. Corporations, big or small, may not escape from managing their energy supply chains or the carbon footprints of their supply chains. Energy supply chains may disrupt traditional physical and financial value networks so much so that different business models with diverse revenue streams may evolve and dissolve at a 'clockspeed' hitherto unimaginable. Eurasia may lead the storm and Africa may be the ultimate economic prize for uncommon strategic visionaries. This paper suggests why this scenario may be plausible.

KEYWORDS

Logistics, Supply Chain, eBusiness, Nuclear Energy, Metabolic Engineering, ITER, STAR, carbon footprints

INTRODUCTION

The writing on the wall reads: railroad logistics will connect Cape Town to Beijing. An imminent sea of changes could transform global supply chains and transportation logistics to strengthen the political economy of Asia and in particular, China's unbridled ambition to be the (only) super power in the 22nd Century. What Russia seeded in the 20th Century as the Trans-Siberian Railroad [¹] may be harvested by China in the 21st Century in the form of tri-continental value chain. In the next decade, a bridge and a tunnel may be built to close the 13km water shelf between Morocco and Spain. Tri-continental logistics may come of age in an environment where carbon footprints of supply chains will be mandated by law.

EMERGING ISSUE

For tri-continental logistics to operate and grow, Africa, Europe and Asia must prefer to use rail roads for logistics. But, at what cost and with what form of energy to reduce carbon footprints?

ONE POTENTIAL SOLUTION

Systemic mimicry of the lessons from industrial electrification during the 1920's holds the key [2]. Energy for rail transport must be a self-sufficient system since electricity grid infrastructure may still remain unavailable in some regions of Africa. Volatility in oil and gas resources and price shall increasingly favour the demand for self-contained power aboard the rail car. The energy source may be fashioned after power systems in nuclear submarines. US DoE has developed versions of small secure transportable autonomous reactors referred to as STAR [3]. Several other products exist [4] and commercial exploitation of STAR systems by locomotive and energy manufacturers may bridge the chasm that could otherwise cripple the progress of railroad logistics, especially in Africa. Railroad may serve China's insatiable demand for raw materials for its growth and quest for new markets for its cheap commodities. Railroad may be the disruptive driver that could connect Africa and China. Europe and South East Asia will be the economic beneficiaries. Visibility of supply chain management [5], software system of systems interoperability [6], automatic identification [7], real-time data [8], real-time communication, predictive analytics [9], security and customs transparency may evolve in parallel with tri-continental railway logistics operation. Advanced small economies, for example, Taiwan, Singapore, Ireland and Iceland may benefit if their knowledge economies can garner the role of business service providers. The economies of Spain and Morocco may undergo strategic transformations if they improve the structure of their infrastructure, including education.

FUTURE (?)

Africa is the next global frontier for revenue growth for the corporate energy manufacturers (GE, Siemens, ABB). Evolution of ITER (international thermonuclear experimental reactor) to produce commercial nuclear fusion power plants [10] may gradually replace non-renewable but clean and safe nuclear fission energy. On the other hand, chemical engineering behemoths (GE, BASF, P&G, Genzyme) will market domestic fuel kits (butanol, pentanol) by productizing metabolic engineering [11] of bacteria. On-demand liquid fuel in your garage may be soon replaced by fission powered domestic nuclear fusion power plants in the kitchen.

TEMPORARY CONCLUSION

Driven by legislation to account for carbon footprints, sustainable energy may be the differentiating disruptive element. WiTriCity (wireless electricity) and WiFi (wireless data) will co-exist with FuFi (Fusion-Fission energy). The balance sheet of low-carbon energy will offer disruptive advantages or disadvantages for business and logistics. In the next wave, FuFi powered self-navigating automobiles could retire the use of railways. Continual convergence of innovation in global public goods [¹²], energy and global health [¹³] will spawn new markets and creative e-business models to further spur the brewing race between the sluggish Elephant and the mighty Dragon, for the ultimate in global workforce-demographics mediated economic dominance.

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