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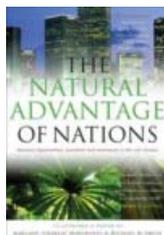
"Alan AtKisson is the freshest and wisest voice to emerge from the sustainability movement in many years. Believing Cassandra manages to be incisive, humorous, and hopeful. It renews our sense of the possible and expands the dimensions of our collective intelligence, transforming our sense of the future from a curse to a blessing."

Paul Hawken, author, *The Ecology of Commerce* and co-author, *Natural Capitalism*

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The Natural Advantage of Nations (Vol. I): Business Opportunities, Innovation and Governance in the 21st Century



This book is about innovation, solutions, competitiveness and profitability. It is also about building environmental integrity and sustainability now and for future generations. It draws a bold vision for the future and tells us how to get there by building on the lessons of competitive advantage theory and the latest in sustainability, economics, innovation, business and governance theory and practice. The authors incorporate innovative technical, structural and social advances, and explore the role that governance can play in both leading and underpinning business and communities in the shift towards a sustainable future. The result is nothing less than the most authoritative and comprehensive guide to building the new ecologically sustainable economy. [\(more...\)](#)

Chapter 1 (Part 2) - Significant potential for resource productivity improvements

There are numerous methods for combining sustainable development and competitiveness that are profitable, backed up by numerous case studies of cost effective, resource efficient production, and numerous examples of product eco-design that are convincing to even the most sceptical.^[17]

Our central message is that the environment–competitiveness debate has been framed incorrectly. The notion of inevitable struggle between ecology and the economy grows out of a static view of environment regulation, in which technology, products, processes and customer needs are all fixed. In this static world, where firms have already made their cost-minimizing choices, environmental regulation inevitably raises costs and will tend to reduce the market share of domestic companies on global markets. Managers must start to recognise environmental improvement as an economic and competitive opportunity, not as an annoying cost or an inevitable threat. Environmental progress demands that companies innovate to raise resource productivity, precisely the new challenge of global competition. It is time to build on the underlying economic logic that links the environment, resource productivity, innovation, and competitiveness.

Professor Michael Porter, Harvard Business School^[18]

Porter's line of argument is consistent with the literature covering issues of levels of inefficiency, which has produced convincing empirical evidence of widespread and significant inefficiencies within firms in the modern economy.^[19] This area of writing is known as X-inefficiency literature. Empirical research in the approach to measuring X-inefficiency has shown that the actual performance of firms in many industries falls significantly below that of the observed efficiencies of the most efficient firms in those industries, typically 65–97 per cent. For example, one of the significant sources of gains still poorly understood is the improved level of resource productivity possible through whole system design. Whole system design is showing that companies can often achieve bigger resource productivity gains for less cost than incremental change.^[20]

I believe we can accomplish great and profitable things within a new conceptual framework: one that values our legacy, honours diversity, and feeds ecosystems and societies... It is time for designs that are creative, abundant, prosperous, and intelligent from the start.

William McDonough, *Time Magazine Hero of the Planet*, 1999^[21]

Consider the case of Jan Schilham's famous work on pipes and pumps for Interface Ltd. In 1997, while Interface was building a factory in Shanghai: 'One of its industrial processes required 14 pumps. In optimizing the design, the top Western specialist firm sized the pump motors to total 95 horsepower. But by applying methods learned from Singaporean efficiency expert Eng Lock Lee (and focusing on reducing waste in the form of friction), it cut the design's pumping power to only 7 horsepower – a 92 per cent or 12-fold energy saving – while reducing its capital cost and improving its performance in every respect.'^[22] Why is this significant? As Amory Lovins writes: 'Pumping is the biggest use of

motors, motors use 3/5 of all electricity. Saving one unit of friction in the pipe saves 10 units of fuel. And, because of all the large amount of losses of electricity in its transmission from the power plant to the end use, saving one unit of energy for the pump/pipe system saves upwards of ten units of fuel at the power plant.'

This case study highlights a key reason why these new methods offer such benefits to any company and/or nation that implements them. Such approaches offer multiple benefits because as much as 70 per cent of their resource usage is locked into the design: by then, much of the environmental impact, that may be designed away, is already inevitable.[23] Change the design and there are numerous flow on benefits. In the famous case study above additional benefits included a reduction in friction loss from pipes; these changes led to reduced noise and maintenance, whilst providing a longer life for the pipes.

Table 1.1 *Emerging solutions and rewards: pioneers who are 'walking the talk'*

Mining	BioHeap, is a climate positive leaching process, (the process actually absorbs carbon dioxide out of the atmosphere) for treating nickel and copper ores. Developed by Titan Resources in Western Australia, the process eliminates the need to grind ore finely and leaves behind an inert residue. BioHeap has reduced the cost of producing nickel to less than half its value on the world market.
Climate neutral buildings	The Beddington 'zero (fossil) energy development', involving a range of bodies such as Arup, is Britain's first urban carbon-neutral development. BedZED's zerocarbon 'total energy strategy' is achieved via energy-efficient design of the buildings, use of renewable energy sources and a green transport plan.
Mining wastes or mining resources?	Hatch Engineering has developed a revolutionary method of reusing slag waste in concrete, significantly reducing the greenhouse emissions whilst also achieving zero waste outcomes and increasing productivity. They are now applying the Cemstar Process technology with clients globally as part of a major international programme.
Desalination	A London-based group has recently developed a revolutionary design to dramatically reduce the costs of desalination. The ingenious building for desalination operates at a fraction of the cost of traditional desalination plants. The first seawater greenhouse has been built on Tenerife, partly with European Commission funds. A second is under development in Oman and there are plans for many others.
Oil Companies	BP Australia are offering petrol at slightly higher cost with the promise that the money will be used to begin to off-set the carbon emissions, in an attempt to achieve an overall climate neutral outcome. If successful, this programme to internalize the real costs to the environment of petrol use will be rolled out by BP internationally.
Win-win options for waste and forestry	The 1999 Gold Medal for CSIRO research was awarded to a team that worked for ten years on how best to re-use treated effluent. Urgent research was commissioned into the disposal of town effluent, partly as a response to toxic blue green algae outbreaks in the Murray Darling system. CSIRO Land and Water and CSIRO Forestry and Forest Products have used their experience over ten years to produce environmental guidelines for councils, irrigators and foresters on the sustainable use of effluent in forestry.
Filtration of industrial processes	The University of Melbourne together with the CSIRO have developed a totally new form of industrial pressurized filtration. Industrial pressurized filtration is responsible for over one-third of all the energy used in filtration globally. This completely new methodology and design provides at least 30–40% efficiency gains for existing plants, and significantly more for new plants.

When properly understood, the sustainable development paradigm offers significant productivity gains through such proven methodologies as lean thinking. These improve resource and labour productivity whilst simultaneously reducing inventory and capital costs and the risk of exposure to excess stock in an economic downturn.[24] The growing understanding of this by many companies is illustrated by the fact that of the 150 global corporate members of the World Business Council for Sustainable Development (WBCSD),[25] 92 have

Vice Presidents for Sustainable Development. Wise firms are now integrating sustainable development orientated reforms as part of their strategic lean thinking programmes.

The ideas behind lean thinking have resulted from a re-examination of global manufacturing systems and supply chains. World-renowned industrial economists James Womack and Daniel Jones^[26] have found that, far from being beneficial, the globalization of production often creates enormous unnecessary waste in global inventories. Apart from demonstrating the wisdom of re-examining the nuts and bolts of companies and their supply chains, they also found that an alternative closed loop economy involving more recycling was much more cost effective than transporting materials from all over the world.

Next Part 

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Foundation Partners in the research, development and review of the book.



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