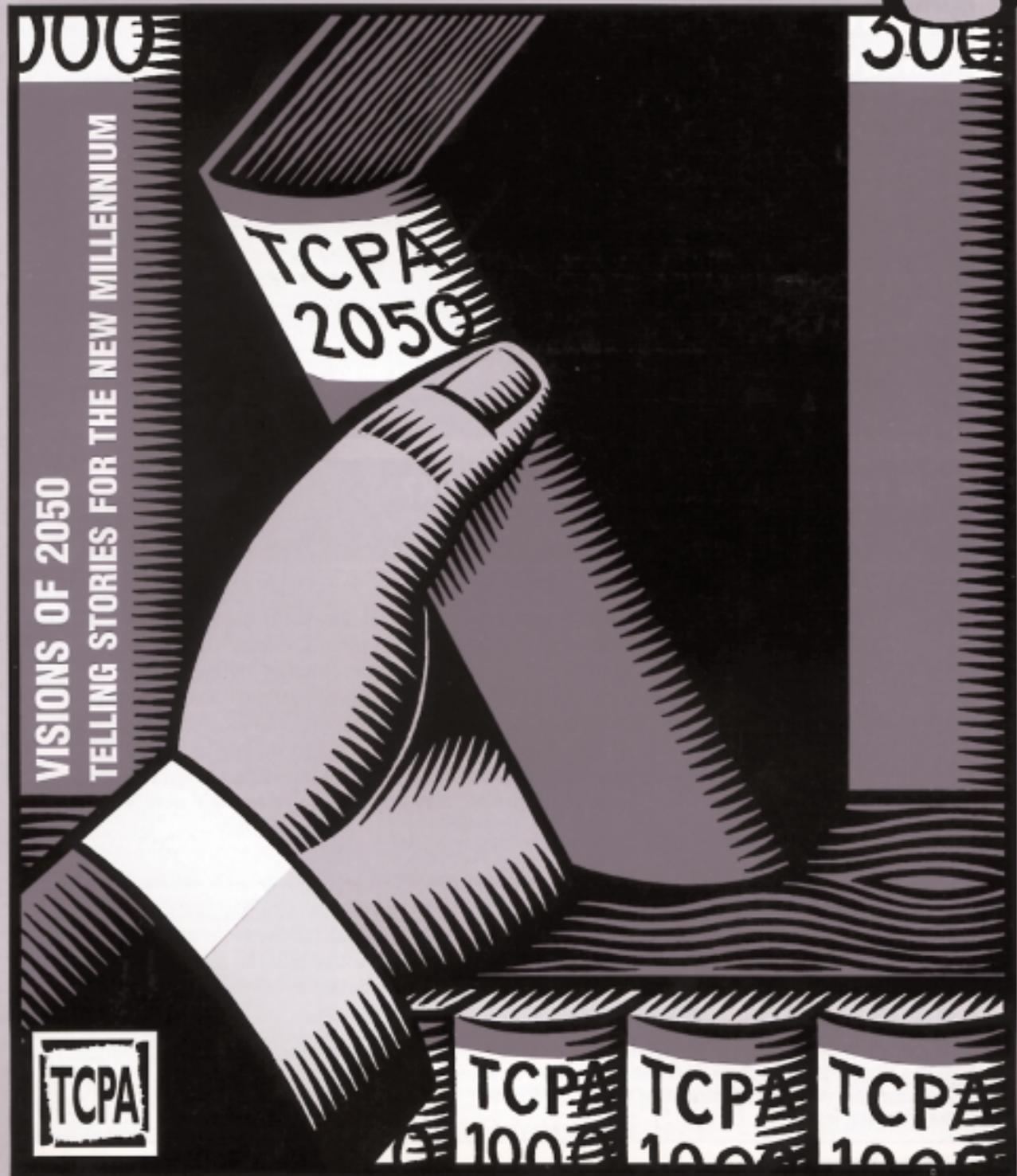


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# The Greening of Human Settlements

Amory B. Lovins

The next industrial revolution is starting to emerge, and over the next half-century, it will rapidly unfold. The first industrial revolution made people 100 times more productive when the relative scarcity of people was limiting progress in exploiting seemingly boundless nature. Following the same economic logic, today's different pattern of scarcity —abundant people but scarce *nature*— will cause us to use nature 10- to 100-fold more productively. This entails new business concepts and practices that are already giving their early adopters improved profitability and competitive advantage to such a degree that the private sector is displacing government regulation in the vanguard of environmentally restorative reforms.

The new book *Natural Capitalism*, by Paul Hawken and Amory and Hunter Lovins (Earthscan, London, 1999), describes what market capitalism could be like if it behaved as if nature and people were properly valued. Its hundreds of practical examples show how reducing both resource depletion and pollution nearly to zero can be extraordinarily profitable at today's prices and using today's technologies (but artfully combined in holistic Victorian style).

Advanced resource productivity that 'tunnels through the cost barrier' can often make very large savings cost less than small or no savings, usually through integrative design that achieves multiple benefits from single expenditures. Redesigning production processes on biological models can eliminate waste and toxicity. A 'solutions economy based on the continuous flow of value and service can align providers' with customers' interests so that both parties are rewarded for doing more and better with less for longer. The resulting profits can be reinvested, as any prudent capitalist would do, in restoring, protecting, and expanding natural capital — the healthy ecosystems without whose resources and services we cannot live.

All these steps support in turn a worthier use of people that nourishes community and culture. Sacking the unproductive tonnes, litres, and kilowatt-hours offers the opportunity to keep the people, who will have more and better work to do. Reversing the interlinked waste of resources, money, and people can turn into virtuous circles the vicious circles that today yield such related pathologies as lack of work and hope, and shortages of security and satisfaction.

*Natural Capitalism* describes how integrative design has closely approached this ambitious goal even in the challenging setting of Curitiba, Brazil: its population has quadrupled to 2.6 million in the past 20 years, yet it has become, with scant resources, one of the world's great cities.

Implementing such innovations is neither instant nor easy. Many 'barrier-busting' reforms, both in public policy and within firms, are needed to turn the scores of obstacles into business opportunities. Ecological tax reform that shifts taxation from what we want more of (jobs and income) to what we want less of (depletion and pollution) would also be helpful. So would de-subsidisation, score-keeping by metrics more informative than GOP, and internalising costs, including the costs of development: developers no less than the rest of us should get what they pay for and pay for what they get. Yet even in the absence of all these reforms, natural capitalism is rapidly gaining momentum simply from its overwhelming commercial merit.

This is particularly clear in the fast-growing movement toward green design in buildings and land use. Rocky Mountain Institute's 1997 text *Green Development: Integrating Ecology and Real Estate*, introduced and sold by the Urban Land Institute to its developer members, is already redefining the profession of development as a tool for healing natural and human communities. As 100 case studies show in the book and its companion CD-ROM, the same design integration that yields greatly improved environmental, resource, and human performance also typically yields superior market and financial performance. This is a language developers understand. The smart ones are already moving rapidly in this direction, in every real-estate product category and in most of the world. Their rivals are hard pressed to keep pace.

It may seem implausible that the planning apparatus so painstakingly built up in England in the second half of the 20th century may become less necessary, ultimately perhaps even unnecessary, as developers learn to pursue enlightened self-interest. Yet it is not unthinkable.

Already, developers in the US, subject to little or no land use planning, are building under *laissez-faire* regu-

lation some of the greenest new towns on the planet, such as Haymount in Virginia— because such designs work better, cost less, and sell better. When land planned for New Urbanist housing exhibits manyfold greater market value than land with superficially better amenity but laid out with ‘dead-worm-pattern’ streets — designed for cars, not people — it becomes clear that even unsophisticated American house-buyers, uninformed by planning, know a better place to live when they see it.

Integrative design typically includes extensive landscaping; co-location of housing, shops, recreation, and workplaces; high density combined with exceptional beauty, diversity, and attractiveness; pedestrian- and cycle-dominated transport; natural hydrology; and buildings that require little or no energy. (Houses needing no heating or cooling have been built, with the same or better comfort but with lower construction cost, in climates from ~44oC to +46oC.) Many such features reinforce each other.

For example, Village Homes, a 1970s green development in Davis, California, pioneered the use of natural drainage swales instead of concrete civil works for stormwater. The saved \$800 per house was leveraged into extensive and mainly edible landscaping (organic gardens, orchards, parks etc.) whose crop revenues supported maintenance and daycare. The greenery moderated the microclimate, yielding greater comfort at lower cost. The child-friendly greenways between the fronts of the houses became so well-used that crime was 90 per cent lower than in adjacent developments designed round cars. The houses, once considered so odd that estate agents wouldn’t show them, are now the most desirable in Davis.

Today’s state of the art can let sophisticated housing rest so lightly on the earth that it requires no infrastructure in the ground. Efficiently used electricity (my own house averages only about 110 watts) comes from building-integrated photo-voltaics, unless a better renewable alternative is locally available. Potable water comes from rooftop collection stored in cisterns (which can be remotely dispatched as a ‘distributed reservoir’ for stormwater management). Stormwater is treated as habitat, captured in permeable landscaping and moved, if needed, on the surface. Wastewater is not created, thanks to gray-water use and Swedish separating toilets that properly treat human wastes as nutrients, using modern techniques that meet high aesthetic and hygienic standards.

And telecommunications, both data and voice, use spread-spectrum wireless: if Mongolian yurts can do it, why can’t British houses? *The Economist* recently remarked that the 2 billion people who haven’t yet seen a telephone pole probably never will, because their power will be solar and their telecom wireless. But this is also starting to make excellent practical and economic sense for the rest of us too, even in British climates.

There is far more to be said about where these coupled revolutions will lead land use. *Natural Capitalism* only hints at the richness of the subject. But enough is now known to predict with confidence that business will not be as usual. Whether we expect and help it or not, a far more attractive future is pushing up through the cracks, and may soon surprise us with its ability to align social imperatives with market motives. Just as we are heading towards an economy where firms that require anti-pollution regulation will already have gone bust for other reasons, so we may be seeing the emergence of land use practices that will ultimately make spatial planning a quaint anachronism.

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