

COSTS

CLEAN TECH WRECKS

Clean green technologies are at the center of the many special reports leading to Rio+20. Understandably, governments have focused on access to “know-how.” Since 1992, however, costly, resource-wasting experience has taught that “know-how” must be accompanied with “know-what” – assessment of the technology choices available – and “know-why” – a participatory analysis of socioeconomic and environmental needs a technology is to address. Technology transfer without technology assessment – especially under the intense pressure to respond to climate change and environmental deterioration – is dangerous. Here are some recent examples of where ostensibly clean green technologies may be wasting time and resources...



Illustration 1: Origami : Elkosi

- 1. NUCLEAR ENERGY:** Governments spent \$56 billion on the commercially unproven theory of nuclear fusion (1974-2008) but spent only \$40 billion to improve energy efficiency.¹ Following Fukushima, many governments are abandoning nuclear technologies but the costs of decommissioning power plants (\$300 million - \$1 billion each) and the near-permanent storage of radioactive wastes (\$ trillions) will be with us for millennia.²
- 2. SYNTHETIC FUELS:** US synthetic fuel research in the 1980s assumed that the new technology would replace 25% of US oil imports. The program was cancelled after 5 years and almost \$5 billion reaching only 2% of its production target.³
- 3. BIOPROCESSING:** Between the early '80s and early '90s, scores of startup companies proposed to use cell and tissue culture technologies to bioprocess high-value plant commodities ranging from vanilla to coffee. Once the nutrient medium was discovered, scientists reasoned, they could economically brew the essential ingredients in factory fermentation tanks. Scaling-up from the lab proved insurmountable, however, and the waste in scientist hours and R&D spending has never been calculated.

RIO+20 AND TECHNOLOGY ASSESSMENT

Technology Transfer ("Know-How") without Technology Assessment ("Know What") is like buying airplanes and training pilots without building airports and training air-traffic controllers. ETC's series of issue papers and case studies call upon Rio+20 to establish UN-level Technology Assessment either through an Office of Technology Assessment attached to the UN General Assembly or through a specialized unit attached to a new sustainability facility associated with ECOSOC, UNCSD or UNEP.

- 4. BIOFUELS:** Despite governments spending \$20 billion annually subsidizing the development of second- and third-generation biofuels,⁴ chemical giants like Dow and heavily funded start-ups like Amyris (whose share price, over the last 13 months, plummeted from \$33.85 to \$2.87) are jumping ship and, according to *The Wall Street Journal*, the United States is unlikely to produce the 16 billion gallons cellulose fuel the government targeted for 2022.⁵ An April 2012 EU draft

report concluded that conventional biofuels exacerbate GHG emissions and are financially impracticable.⁶

5. **BIOTECH:** R&D in agricultural biotech has exceeded \$16 billion but has only impacted four commercial crops – cotton, canola, soybean, maize – with highly-disputed results. Biotech has made plant breeding vastly more expensive – the cost of a genetically modified plant trait averages \$136 million⁷ compared to less than \$1 million for a conventional variety. Across all biotech fields, the number of biotech start-ups receiving funding and total private investment has dropped by almost one third since 2007 and start-up shares last year sold almost one third below expectations. Some venture capitalists have stopped funding new biotech altogether.⁸
6. **WIND ENERGY:** Although wind power continues to have enormous positive potential, more than \$500 million in high-tech US and German research between 1975 and 1988 led to technological failures and market collapse setting scientific investigation back decades. With less than \$20 million, bottom-up Danish research during the same period led the way to successes, supplying 45% of total worldwide wind turbine capacity by 1990.⁹ After wasting money, human resources and destroying investor confidence, an important technology is struggling for a comeback.
7. **NANOTECHNOLOGY:** Since 2000, more than \$50 billion has been invested in nanotechnology R&D with ‘very little’ to show for it. There is still no globally accepted definition of nanotechnology or agreed methods for measuring or evaluating nanoparticles. Literally every week, scientific studies are published that raise concerns about nanoparticles’ health and environmental impacts. Private investment plummeted 40% in 2009 and another 21% in 2010. According to industry analysts, last decade’s nano-buzz is being quickly replaced by ‘cleantech’ hype, with companies shifting emphasis to try to profit from governments’ (renewed) focus on green energy.
8. **SYNTHETIC BIOLOGY:** Dozens of start-up companies, retreating from biofuels, are targeting the \$22 billion flavour, colouring and fragrance market in a second attempt to take climate and geography out of the production of high-value crops. *En route*, they are patenting access to the 8 metabolic pathways that lead to roughly 200,000 plant compounds including the world’s several hundred most important and valuable food and cosmetic ingredients. Whether the new technology succeeds or fails, its impact on venture capital markets could spill over to disrupt commodity prices and distort export strategies.

FOR MORE INFORMATION

ETC Group has published several documents on issues related to Rio+20 and new technologies, including *Who Will Control the Green Economy?*, *Tackling Technology: Three Proposals for Rio (Submission to Zero Draft)*, *The New Biomasters. Synthetic Biology and the Next Assault on Biodiversity and Livelihoods*, *The Big Downturn. Nanogeopolitics* available on our website: www.etcgroup.org/en/rio

See also: *The Potential Impacts of Synthetic Biology on the Conservation & Sustainable Use of Biodiversity: A Submission to the Convention on Biological Diversity’s Subsidiary Body on Scientific, Technical & Technological Advice (A Submission from Civil Society)*

<http://www.etcgroup.org/en/node/5291>

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