

Reinventing Fire (新しい火の創造)

Reinventing Fire, a graphics-rich business book published 4 October 2012 in Japan and a year earlier in the United States, presents the findings of an independent, detailed \$6-million study performed by 61 staff of Rocky Mountain Institute over 6 quarters, with extensive industry support in content and peer review. (RMI is an independent, nonprofit, 30-year-old think-and-do tank that drives the efficient and restorative use of resources, chiefly in collaboration with the private sector.) The book's Forewords are by the President of Shell Oil and the Chairman of Exelon, which is the largest nuclear and the third-largest coal-fired electricity company in the United States. *Reinventing Fire* has been warmly received by many American business leaders.

Reinventing Fire shows how to run a 2.6×-bigger U.S. economy in 2050 with no oil, coal, or nuclear energy, one-third less natural gas, a \$5-trillion lower net-present-value cost than business-as-usual (valuing carbon and all other externalities at zero), no new inventions, and no new national taxes, subsidies, mandates, or laws—the transition led by business for profit. The needed market-oriented policies can be adopted administratively or at State level, analogous to Japanese Prefectures.

These surprising results are made possible by two unusual integrations: across all four energy-using sectors (transportation, buildings, industry, and electricity), and across four kinds of innovation (not just technology and public policy, but also design and strategy). *Reinventing Fire* also focuses closely on advanced energy efficiency through integrative design, which can often make very large energy savings—in vehicles, buildings, and factories—cost *less* than small or no savings, turning diminishing returns into expanding returns. Including integrative design yields 3–4× gains in energy productivity in U.S. buildings with a 33% Internal Rate of Return, 21% in industry with a 21% IRR, and much greater mobility with a 17% IRR but no oil. The IRR across the whole U.S. economy, including a resilient 80%-renewable electricity supply system, is 14%. Thus this transition beyond oil, coal, and nuclear energy is extremely profitable.

Of course, Japan differs from the U.S. in many important ways. But the similarities may be even more important. Both Japan and the United States have major untapped efficiency potential despite past achievements; both have exceptionally rich renewable energy resources; both have gridlocked central governments but much diversity and vitality at other levels of government; and both have powerful business capabilities that need not wait for coherent central-government policy. Japanese business leaders may therefore find that even if their policy environment differs greatly, *Reinventing Fire's* innovations in technology, design, and strategy could often be adapted to Japanese conditions with broadly analogous results. Indeed, Japan's more cohesive society could probably do this faster than in any other country. Japan could thus exercise profound global leadership in the world's emerging energy transformation.