A transdisciplinary "grand synthesis" published in 2011 by Rocky Moun-
tain Institute (RMI) showed in detail how to run a 2.6x-bigger 2050 U.S. 
economy with no oil, coal, or nuclear energy, one-third less natural gas, 
82–86% lower fossil carbon emissions, and a $5-trillion lower net-
present-value cost than business-as-usual (counting all externalities at 
zero). The transition requires no inventions nor Acts of Congress, but can 
be led by business for profit, enabled by administrative and state policy innovations and sped by 
military innovation. These surprising outcomes emerge from integrating all four energy-using 
sectors (transportation, buildings, industry, and electricity) and four kinds of innovations—not 
just technology and public policy but also design and business strategy. A key theme, Integrative 
design, often makes very large energy savings cost less than small or no savings, turning dimin-
ishing returns into expanding returns. An efficient, diverse, distributed, renewable electricity 
system can yield important economic, risk-management, and resilience benefits. These civilian 
findings also reflect important military opportunities for more fight with less fuel and for more 
resilient facilities and effective operations. RMI recently launched a collaborative initiative to 
apply Reinventing Fire’s findings to China.

Abridged Biography:
Amory B. Lovins has been active in ~50 countries for nearly 40 years as an innovator and practi-
tioner in energy and its links to security, development, environment, and economy. He is 
cofounder (1982), Chief Scientist, and Chairman Emeritus of Rocky Mountain Institute—an 
independent, entrepreneurial, nonprofit think-and-do tank that drives the efficient and restor-
ative use of resources. In 2009, Time named him one of the 100 most influential people in the 
world. He has briefed 23 heads of state, advises industries and governments worldwide (as well 
as DoD and DOE) mainly on advanced energy and resource efficiency, and has led the supereffi-
cient redesign of >$40 billion worth of facilities in 29 sectors. Dr. Lovins has received ten honor-
ary doctorates and won many awards. He has provided expert testimony in eight countries and 
published 29 books. These books include Reinventing Fire, Winning the Oil Endgame, Small is 
Profitable, Brittle Power, and Natural Capitalism.