

REINVENTING FIRE



ROCKY
MOUNTAIN
INSTITUTE®

REINVENTING FIRE

Driving the business-led transition from oil, coal, and ultimately natural gas to efficiency and renewables.

Reinventing Fire has two main goals:

1. To create a clear and practical vision of a fossil-fuel-free future for the United States backed up by quantitative analysis.
2. To map a pathway to achieve that future, led largely by business.

Our vision and pathway will offer a message of hope, put the spotlight on leaders, catalyze others to act, and inform and help to catalyze innovative policies.

“Today, we do not need to convince the world that Reinventing Fire is necessary. Instead, we must work together to make it happen.”

–Amory B. Lovins

WE CAN'T DO IT ALONE.

Rocky Mountain Institute® is not only a worldwide leader in synthesizing energy efficiency and renewable energy solutions. As our Charity Navigator four-star rating notes (www.charitynavigator.org), we're also very serious about the stewardship of charitable funds.

You can be certain that any charitable gift made to RMI will achieve important, lasting, and thoughtfully designed results. Our vision is a world thriving, verdant, and secure, for all, for ever. Our mission is to drive the efficient and restorative use of resources. And our strategic focus, executed through specific initiatives designed to take our work rapidly to scale, is to map and drive the transition from coal and oil to efficiency and renewables.

So whether you choose to support RMI with unrestricted funds or you prefer that your contribution be applied to our work in one of the four sectors described in this brochure, you can be confident that your gift will be prudently and transparently managed and boldly and effectively applied.

Our focus on efficiency doesn't end with energy. It applies to your dollars as well. The 27-year history of Rocky Mountain Institute attests to that.

With grateful appreciation for your support,

All of us at RMI

By focusing Reinventing Fire on the profitable transition from oil, coal, and ultimately natural gas to efficiency and renewables, RMI examined the four sectors that use fossil fuel—buildings, transport, industry, and electricity. We analyzed each sector's usage patterns and barriers to change, gleaned lessons from RMI's experience, and shaped first generic programs, then specific initiatives, for each sector.



The Built Environment

Despite new technologies, codes, and design strategies, the U.S. building stock is not much more energy efficient than it was twenty-five years ago—it uses 70 percent of the U.S. electricity, half of which is made from coal.

RMI is developing two initiatives to address barriers to efficiency—one in existing commercial buildings, the other in new “production” homes. While both efforts are in the planning stages, RMI's practitioners are excited by the opportunity to transform the efficiency profile of America's building stock. Both initiatives will emphasize “amplification” techniques to drive training and put tools in the hands of a fast-growing wave of designers, engineers, and builders, and to induce building owners, managers, and tenants to demand more comfortable and affordable buildings.

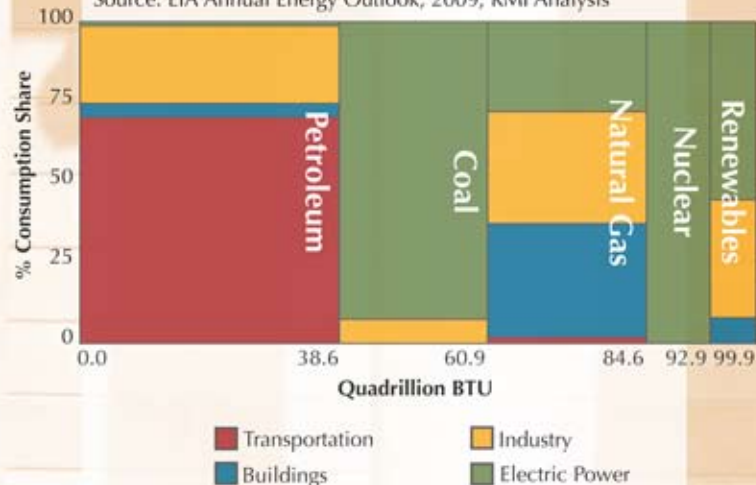
The Transportation Sector

Transportation uses 70 percent of U.S. oil. Between 1950 and 2009, consumption of petroleum fuels increased by 65 percent, and although gasoline demand in the U.S. has lately declined, the sector is still about 98 percent dependent on fossil fuels.

RMI's first planned transportation initiative focuses on fleet managers and owners, their choices, and policies influencing them and vehicle makers. This “Economic Buyers” initiative will help us understand the emerging market segmentation, and determine what technology options (including lightweighting) may be best suited to each segment and across segments, while helping shape fleet managers' demands in ways that save energy and money. These insights may, in later stages, inform additional product development, building on RMI's extensive experience. We also plan to ensure that the policy work RMI began in *Winning the Oil Endgame*—around feebates, for example—is properly carried forward.

Primary Energy Consumption in the U.S. (2008)

Source: EIA Annual Energy Outlook, 2009; RMI Analysis



Our current reliance on fossil fuels. Eighty-five percent of the energy we use is generated from oil, coal, and natural gas in the four sectors that Reinventing Fire is targeting.

The Electrical Sector

Coal fueled 41 percent of the growth in U.S. electricity generation during 1990–2004 (along with 36 percent from natural gas and 23 percent from running existing nuclear plants harder). While traditional analyses focus on how to keep running coal plants but somehow fix them so they emit less carbon, RMI is focusing on something far less expensive and risky—replacing coal (and eventually natural gas) plants with efficiency and renewables.

Our analysts have identified at least four fundamental barriers to developing a zero-carbon U.S. electricity system by 2050: no compelling vision and plan that demonstrates technical and economic viability; insufficient progress in capturing, and often even in recognizing, known energy efficiency potential; an incomplete understanding of how to manage the many transitions required for full implementation; and public ignorance and disinformation about a low- or no-carbon electrical system.

RMI is developing an initiative focused on the first barrier, combined with elements of the third. RMI's "Next-Generation Utility" (NGU) will leverage a robust but user-friendly graphical model of how a utility dispatches its resources to match changing loads. The model is underpinned by research into each resource, and is being used in real-world exercises with large and small utilities. This tool will help utilities and regulators understand the relative risks, opportunities, and economics of organic, small-step-at-a-time renewable and efficiency vs. "big-bet" nuclear or coal sequestration investments. The goal is to identify and support leading utilities in developing profitable paths to low- and no-carbon operations.



The Industrial Sector

Industrial processes use 31 percent of U.S. energy. Chemical industries, paper, metals, materials and resources, and oil refining—powered by coal (electricity), oil, and natural gas, and a small amount of biomass—are 83 percent of this use (according to USEIA). RMI believes that many industrial processes—as well as the goods they produce—can be made much more efficient. RMI's planned initiative for the industrial sector will focus on manufacturing process efficiency, using a structured technique based on starting with theoretical minima (derived from process physics and chemistry, not standard practice) both for energy-intensive "heavy industry" and for key producers of renewable energy equipment in order to drive down supply costs more quickly. RMI also hopes to work with top industry energy consumers (chemical, metal, paper producers) on transforming their business models.

The industrial initiative will be linked to a design-focused initiative, already underway, called 10xE, or Factor Ten Engineering (www.10xE.org). RMI's practice—redesigning vehicles, buildings, and lately more than \$30 billion worth of industrial facilities in 29 sectors—has proven that integrative design can yield not diminishing returns to investments in energy efficiency, as normally assumed, but expanding returns, so very large savings can often cost less than small ones. 10xE aims to apply this gamechanging insight to how engineering is taught and practiced.

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Rocky Mountain Institute® (RMI) is an
independent, entrepreneurial, 501(c)(3)
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and restorative use of resources to create a
world that is thriving, verdant, and secure,
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