What RMI's Supporters and Staff Created Together

1970s:

1972– • Invented most of the ways now in use for making markets in saved electricity and other resources (energy)

1975–2002 • Showed how "distributed benefits" make decentralized electric resources as much as ten times more valuable (*Small Is Profitable*, www.smallisprofitable.org) (energy)

1977– • Helped 18 heads of state understand the links between efficiency and security, environment and prosperity (energy)

• Laid most of the conceptual and technical foundations for the multi-billion-dollar "negawatt" (electric-efficiency) industry (energy)

• Showed how to eliminate oil insecurity at a profit, and in 1988–89, how to save ~80% of U.S. oil use for a few dollars per barrel (security)

1978–83 • Formulated the first internally consistent approach to nuclear nonproliferation, lately vindicated (*Energy/War: Breaking the Nuclear Link*, "Nuclear Power and Nuclear Bombs" [*Foreign Affairs*], *The First World Nuclear War*), including the first unclassified but convincing demonstration of the proliferative risks of reactor-grade plutonium and of thorium fuel cycles (security)

early 1980s:

1981– • Reframed the debate by showing academics and CEOs that climate protection is profitable, not costly, because saving fuel is cheaper than buying fuel (*Least-Cost Energy: Solving the CO_2 Problem*, "Least-Cost Climatic Stabilization") (climate)

1981–88 • Showed how nuclear power worsens global warming compared to better buys (climate)

1982– • Designed, constructed, and showed to over 70,000 visitors one of the world's most efficient and well-integrated buildings (paid for privately) (buildings and land) • Prepared for the Pentagon what is still the definitive unclassified study of domestic energy vulnerability, and how to make energy systems inherently resilient at a profit (*Brittle Power: Energy Strategy for National Security*, reposted in 2001), then applied its lessons to U.S. blackout prevention and to Iraqi energy systems resistant to asymmetric warfare (security) • Conceptually linked military, economic, and environmental security (security)

• Gave hundreds of business presentations and broadcasts on profitable climate protection and advanced resource productivity (business innovation) • Developed compelling experience in such industries as electricity, hydrocarbons, chemicals, water, food and beverage, forest products, mining, semiconductors, electronics, general manufacturing, and automotive through detailed technical consultancy around the world, recognized in 2002 alone in a six-page feature in *Fortune* and others in *Time* and *Esquire* (business innovation)

• Laid the groundwork for a "soft water path" — ways to provide the same or better services with less water and usually with less, smaller, and cheaper infrastructure — and, as with energy, "wrote the book" on water-efficient technologies and their implementation (1987–), then co-led their institutionalization (water)

• Provided technical and strategic consultancy for more than 65 of the *Fortune* 500, including several of the world's 50 leading brands (business innovation) • Provided *pro bono* analysis and testimony to help get several uneconomic dams cancelled, including the major Two Forks and Big "A" dams, and to help water-short communities substitute cheap efficiency for costly supply (water)

1983–99 • Systematized design methods that make big savings cheaper than small ones, thus "tunneling through the cost barrier" (*Natural Capitalism*) (energy)

late 1980s

1985– • Created Economic Renewal, an innovative process and toolkit for promoting sustainable local economies, equipped it with topical casebooks and workbooks, and refined it in more than 20 community field trials (community economic development)

1985– • Helped dozens of communities around the world find alternatives to indiscriminate growth, sprawl, and resource-dependent economies (community economic development)

1986 • Created E SOURCE, spun it off in 1992, and sold it in 1999 to the *Financial Times* group; it's the world's leading technical information service on electric efficiency (www.esource.com) (energy)

1986–94 • Researched conventional beef-raising practices and the favorable economics of organic agriculture (farming and forestry)

1988–99 • Codified integrated transportation policy innovations to reduce driving (transportation)

early 1990s

1990–91 • Invented the Hypercar® concept, which could ultimately save as much oil as OPEC now sells, makes light vehicles ready for direct-hydrogen fuel cells, unlocks the hydrogen economy, and can profitably deal with up to two-thirds of the climate challenge (transportation)

• Founded Green Development Services, (now RMI/ENSAR Built Environment Team) a leader in moving the real estate industry toward restorative design (buildings and land)

1991 • Presciently analyzed in *The Atlantic*, "The Avoidable Oil Crisis" (energy)

1991, 2001–2002 • Helped spare the Arctic National Wildlife Refuge from oil extraction by exposing the proposal's fatal national-security and economic flaws (energy)

1991– • Developed the least-cost security thesis of *Security Without War* (1993/2000) and its new strategic triad — conflict avoidance or prevention, conflict resolution, and nonprovocative defense — then injected them into military discourse via lectures at the Naval War College, Naval Postgraduate School, and National Defense University (security) • Helped design several hundred showcase projects, including skyscrapers, retail spaces, affordable housing, convention centers, the Sydney Olympic Village, and the Greening of the White House (buildings and land)

• Served on the boards of Greening America, the U.S. Green Building Council (USGBC), and the Trust for Public Land's National Real Estate Advisory Council (buildings and land)

1991–1997 • Synthesized and published the leading text on a strategy that makes real-estate development a tool for profitably healing natural and human communities (*Green Development: Integrating Ecology and Real Estate*), plus a CD-ROM with 100 (1997), then 200 (2001) case-studies (buildings and land)

1991–98 • Co-created with Pacific Gas and Electric Co. a pioneering demonstration ("ACT²") that most of the energy in new and old buildings can be cost-effectively saved (buildings and land)

1991–99 • Incubated the Hypercar® concept through a $3-million effort by RMI's Hypercar Center (transportation)

1992–97 • Codified 60–80 market failures in buying efficiency, and ways to turn them into business opportunities ("Climate: Making Sense *and* Making Money") (energy)

1993 • Helped establish the LEED (Leadership in Energy & Environmental Design) system for rating green building

(continued)

design (buildings and land)
• Introduced the Hypercar concept worldwide to automakers, potential market entrants, policymakers, and the public (transportation)

1993–2000 • Helped spur the global auto industry to invest ~$10 billion in ultralight hybrid-electric vehicle development (accelerating it by probably a decade or more) by putting the Hypercar concept in the public domain, so nobody could patent it, and maximizing competition in exploiting it (transportation)

1994 • Wrote an acclaimed do-it-yourself *Economic Renewal Guide* and trained others in the process, making it self-replicating (community economic development) • First proved that green buildings valuably boost labor productivity (buildings and land)

late 1990s

1995 • First exposed more than $50 billion of annual Federal energy subsidies, leading to their widespread criticism and eventual decline (energy) • Published "Water Efficiency for Your Home" (water)

1995–98 • Coordinated the Systems Group on Forests, generating novel insights into profitable ways to reduce pressure on natural forests (farming and forestry)

1996 • Developed four scenarios of hypothetical U.S. water futures for EPA ("Water 2010: Four Scenarios for 21st Century Water Systems") (water)

1996–2001 • Predicted grave problems with California's electricity restructuring, then contributed to diagnosis and correction (energy)

1997 • Helped refocus U.S. policy on profitable "barrier-busting" during and after Kyoto (*Climate: Making Sense* and *Making Money*) (climate)
• Coauthored *Factor Four*, adopted by the European Union as a new basis of sustainable development (business innovation)

1997– • Helped shift U.S. climate leadership to the private sector, accelerating carbon reductions (climate)

1998 • Helped design a prototype superefficient office building that is expected to transform the market (buildings and land)

1998–1999 • Spun off Hypercar, Inc. (www.hypercar.com) to support the auto industry's transition to ultralight hybrid-electric vehicles; this partly-owned subsidiary then designed the world's first uncompromised, cost-competitive, 99-mpg midsize SUV, raised $9 million of private equity, and developed the patented Fiberforge™ process for manufacturing carbon-fiber autobodies (transportation)

1998–2002 • Overhauled the U.S. Navy's building design process (security)

1998– • Synthesized a highly advantageous approach to advanced electric efficiency in microchip fabrication plants and other industries (energy)
• Guided STMicroelectronics, one of the world's top five chipmakers, in devising profitable paths to its goal of zero carbon emissions by 2010 (business innovation)

1999 • Coauthored *Natural Capitalism*, a compelling case for business leaders to create the next industrial revolution (now a U.S. best-seller, winner of the Shingo Prize, in or entering a dozen languages, and at www.natcap.org) (business innovation) • Devised environmentally restorative and profitable approaches to the multi-billion-dollar combined sewer overflow problem facing 1,300 U.S. cities and towns, illustrated by low-cost, multi-benefit opportunities for Pittsburgh ("Re-evaluating Stormwater: The Nine Mile Run Model for Restorative Development") (water)

1999– • Launched a consulting practice based on natural capitalism, a new organizing framework for RMI's corporate, small business, and community "applied research" (business innovation) • Published a way, now being adopted, to make the hydrogen economy profitable at each step starting now ("A Strategy for the Hydrogen Transition") (energy) • Developed an influential critique of transgenics and supported international multi-stakeholder dialogues on genomics (farming and forestry) • Experimented with optimal restoration practices for degraded western rangeland and for restoration of alpine wetlands (farming and forestry)

1999–2001 • Found billions of dollars' annual energy savings in land, sea, and air platforms during service on a Defense Science Board panel (*Enhanced Warfighting Capability Through Reduced Fuel Burden*, www.acq.osd.mil/dsb/fuel.pdf) (the first major recommendation, re-engining B-52s, was unanimously endorsed in 2003 for a $6–9 billion present-valued net saving) (security) • Helped debunk the myth of huge electricity use by the Internet (energy)

early 2000s

2000 • Explained the benefits, challenges, and costs of "daylighting" — exposing formerly culverted or buried streams — and developed dozens of U.S. and foreign case-studies (water)

2000–01 • Found nearly $1 million of present-valued savings in a typical Aegis cruiser's "hotel loads" for the Secretary of the Navy, and in 2003, proposed their capture fleetwide (security)

2000–02 • Devised a plan for Oberlin College in Ohio to achieve net zero greenhouse gas emissions by 2020, by far the most aggressive goal for any U.S. college or university (climate)

2001 • Led a major workshop (now being imitated in other regions) on recharging depleted aquifers and managing stormwater and wastewater in the Chino Basin of Southern California (water)

2001–02 • Synthesized more than 20 innovative ways to accelerate the deployment of efficiency and renewable energy without changing taxes, prices, or regulation (energy) • Hosted the Chief of Naval Operations' Strategic Studies Group and a Naval seminar on network-centric warfare (security) • Co-designed a model Brazilian primary school with beautiful daylighting, 75% electricity savings, and probably faster learning (buildings and land) • Working with the world's leading humanitarian organizations, the Navy, and the National Science Foundation, redesigned refugee/displaced-persons camps from scratch, with emphasis on Afghan needs (security)

2001– • Initiated a major compilation of case studies supporting "biophilia," the hypothesis that people are healthier, happier, and more productive in naturalistic spaces (buildings and land) • Addressed dozens of meetings of community planning leaders in the U.S. and abroad (community economic development) • Explored with DoD leadership the potential of Hypercar and whole-system design to make military platforms so efficient that the Pentagon would cease being the world's largest user of oil (security) • After 9/11, provided influential briefs to military leadership and articles for the public on least-cost security, asymmetric warfare, critical infrastructure, and strategic doctrine (security) • Led redesign exercises for one of the world's largest oil companies on how to save over two-fifths of an efficient refinery's energy use, design a stackless refinery, save half of an offshore platform's energy (and recover the rest from waste), and achieve huge energy and cost savings at a giant liquefied-natural-gas plant (business innovation) • Advised Native American leaders on prudent development of their tribes' vast renewable energy resources (energy)

2002 • Created the National Energy Policy Initiative (www.nepinitiative.org), showing that a consensus-based energy policy process can command wide bipartisan support (energy) • Helped EPA apply our *Small Is Profitable* work on optimal scale to water and wastewater sys-

tems, revealing major opportunities to enhance performance and cut cost (water) • Testified in the first-ever U.S. Senate roundtable on green building — applicable to the half-million federal buildings, the nation's largest "fleet" (buildings and land) • Co-hosted the first International Green Building Conference (buildings and land) • Published *Cool Citizens: Household Solutions* (climate) • Published the economic case for early use of fuel cells (*Cleaner Energy, Greener Profits*) (energy)

2002–03 • Helped the City of San Francisco develop a comprehensive energy resource investment strategy (ERIS) for its $100+-million bond issue (energy)

2002– • Taught natural capitalism at Peking University, which trains many of China's future leaders (business innovation)

2003 • Published a guide for profitable climate protection for business leaders (*The New Business Climate: A Guide to Lower Carbon Emission and Better Business Performance*) (climate) • Helped ~90 computer-industry experts devise a 9×-more-efficient but cheaper design for "server farms" (*Design Recommendations for High-Performance Data Centers*) (energy) • Developed a "Community Energy Opportunity Finder" for communities — an Internet-based do-it-yourself tool for developing wealth, saving resources, and improving quality of life (community economic development) • In the world's first known interspecies design project, codesigned the Iowa Primate Leaning Sanctuary with some of its occupants — language-rich bonobos (a Zaïrean great ape) and orangutans — then continued this line of work at the Bronx Zoo and the California Academy of Sciences's new aquarium (buildings and land) • Demystified the hydrogen economy ("Twenty Hydrogen Myths," downloaded 30,000 times in its first 12 weeks) (energy) • Compiled basic "zingers" about national oil security ("Energy Security Facts") (energy)

2003– • Began planning a 2007 summer study to write *10xE: Factor Ten Engineering* — the case-study book on how to achieve radical resource savings at lower cost—and use it to transform how engineering is taught and practiced worldwide (business innovation) • Initiated a major research effort to understand how buildings might mimic natural creatures, systems, and phenomena (biomimicry), and in doing so use less energy and fewer resources (buildings and land)

2004 • Joined the Chicago Climate Exchange as an Associate member to lead by example—quantifying, reducing, then offsetting our greenhouse gas emissions (climate)

2004 • Published the first oil solution—*Winning the Oil Endgame: American Innovation for Profits, Jobs, and Security* (energy), a coherent strategy for ending U.S. (and international) oil dependence, led by business for profit—and in 2005, launched its implementation with initial successes in heavy trucks, cars, and military fuel efficiency (energy)

2004 • Updated RMI's popular "Home Energy Briefs" (energy) • Launched a major energy-efficiency overhaul with one of the world's largest mining companies (business innovation)

2004–05 • Served on the board of the World Green Building Council, helped establish green building councils in several countries (Mexico and Taiwan), and met with high-ranking Chinese officials to promote green building (buildings and land)

late 2000s

2005 • Codesigned a superefficient 58-meter "green" yacht (*Ethereal*) expected to reshape naval architecture, and a 30%-cheaper energy- and water-saving microchip plant that's the talk of the industry and saved a thousand high-tech jobs in Texas (business innovation) • Showed that nuclear power has been surpassed and hopelessly outcompeted by decentralized low- and no-carbon power generation, which yields far more carbon savings per dollar and per year (energy, climate), and published an influential *Scientific American* article "More Profit from Less Carbon" (climate) • Posted an alpha Web portal on biomimetic design solutions (business innovation) • Helped assess green rebuilding opportunities in tsunami-ravaged South Asia, flooded New Orleans, and the rustbelt Cuyahoga Valley of Ohio (buildings and land) • Provided the analysis that led Wal-Mart to require huge energy savings in its buildings and truck fleet and to start considering major biofuel offerings (buildings, transportation) • Helped design the Automotive X Prize and persuade the Federal government to base light-truck efficiency standards on size, not weight, thus encouraging their decoupling; engaged the National Association of Auto Dealers and auto-sector financial leaders in encouraging breakthrough efficiency (trans-portation)

2006 • Adopted the 2030 Challenge—steadily eliminating by 2030 the carbon emissions of all the buildings we design—but, unlike most designers, showed in many practical projects how to do so at comparable or lower capital cost • Helped utilities in four states to modernize their carbon strategies, developed a system-dynamics model to illuminate the climate implications of their investments, and persuaded several states' regulators to include climate in utilities' financial risk management (energy, climate) • Helped Hawai'i shift its oil-dependent energy strategy into a world leader in efficiency and renewables • Made major progress in the car, truck, plane, and military sectors toward making implementation of *Winning the Oil Endgame* irreversible through "institutional acupuncture" (energy, security) • Co-organized leadership conferences on green health-care facility de-sign that can improve clinical outcomes, and received, for our Boulder office, the world's first LEED Platinum rating for a Commercial Interior Retrofit (buildings) • Convened the first national conference of city sustainability directors • Provided a product analysis, development, and conceptual design for a major automotive supplier's ten-year product strategy and deepened our advanced-materials lifecycle analysis (transportation) • Helped the Office of the Secretary of Defense analyze how much military energy efficiency reduces the costs and risks of delivering it, and helped the Army figure out that a third of its wartime fuel use is for gensets making electricity that's almost all used to air-condition the desert (security)

2007 • Achieved gratifying initial results in two proprietary transformative automotive projects, one with a major automaker and the other with Tier One suppliers, and led a private Feebate Forum that stimulated automaker and other stakeholder interest in this novel way to speed efficient cars to market (transportation) • Created breakthrough designs in buildings, chipmaking, cement, mining, ports, biofuels production, and a university (buildings, energy, business innovation) • Became the Clinton Global Initiative's senior energy advisors on major building retrofits as flagship climate-protection projects for some of the world's largest cities (buildings) • Helped Boeing shift the aviation industry toward an efficiency-based climate strategy (transportation) • Finished an internal study reinforcing and extending our findings on how to save half of U.S. natural gas at an eighth of its price (energy) • Presented Stanford's first course on advanced energy efficiency (www.rmi.org/stanford), then applied it to campus buildings (energy) • Renovated and updated our superefficient headquarters building (buildings) • Concluded service on a second Defense Science Board task force on military energy strategy, with major implications for military and civilian energy efficiency, resilience, and renewable supplies (security, energy, transportation)