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Introduction -- The Changing Marketplace -- Overview of the Program -- Strong Partnerships with Industry and Universities -- Advisory Boards and Technical Review Committees -- Program Sponsorship -- Subcontracting -- Cooperative R&D -- User Facilities -- Educational Programs -- Unique Research Facilities -- Indicators of Success -- Scientific Awards and Peer Recognition -- Parents and Licensing -- Commercialized Technologies -- Satisfied Customers -- Highlight: What our Customers are Saying -- Building Technologies -- Building Envelope Systems -- Building Materials -- Heating and Cooling Equipment -- Electric-Powered Heap Pumps -- Thermally Activated Heat Pumps -- Refrigeration Systems -- Existing Buildings -- Technology Transfer -- Highlights: From R-3 to R-30 in Thirty Years, 17 / ORNL Software Helps Industry Design Better Heat Pumps, 19 / Heating and Cooling with Low Electric Demand - The Generator-Absorber Heat Exchange, 22 / Next-Generation Gas Chillers on the Brink of Market Introduction, 24 / Improving Supermarket Refrigeration, 24 / CFC/HCFC Alternatives for the Buildings Sector, 26 / Measuring Particle Drift Velocity to Identify In Situ Refrigerant Mixtures, 27 / Rebuild America, 29 / The Interactive Zip Code Insulation Program (ZIP), 32 / Collaborating with a Historically Black University, 33 -- Transportation Technologies -- Partnership for a New Generation of Vehicles -- Transportation Materials -- Ceramic Technology -- Lightweight Materials -- Alternative Fuels Materials Issues -- Tribology -- Alternative Fuels -- Biofuels Feedstock Development -- Poplar Breeding Success -- Alternative Fuels Utilization -- Bioreactors for Alcohol Fuel Production -- Propulsion Systems -- Automotive Propulsion Technology -- Environmental Control Technology -- Transportation Data and Policy Analysis

In 1961, President John F. Kennedy ignited America’s Apollo Project and sparked a revolution in space exploration. Today the New Apollo Energy Project is poised to revolutionize the production of energy and thereby save our planet. The nation that built the world’s most powerful rockets, its most advanced computers, and its most sophisticated life support systems is ready to create the world’s most powerful solar energy systems, its most advanced wind energy turbines, and its most sophisticated hybrid cars. This will result in nothing less than a second American Revolution. Who are the dreamers in California who believe they can use mirrors and liquid metal to wring more electricity from a ray of sunshine than anyone else on earth can? Who are the innovators who have built a contraption that can turn the energy of a simple wave off the Oregon coast into burnt toast in Idaho? Who are the scientists in Massachusetts who have invented a battery that now runs your hand drill and will soon run your car? Readers will meet them all in this book. They will learn how the new energy economy will grow, the research that is required, and the legislation that must be passed to make the vision a reality. This is a thoughtful, optimistic book, based on sound facts. No one before has tied together the concepts of economic growth and greenhouse gas reductions with such concrete examples. No one has previously told the real stories of the people who are right now on the front lines of the energy revolution. The co-authors, one a U.S. Congressman who is the primary sponsor of the New Apollo Energy Act, and the other the founder of the Apollo Alliance, have joined their experience, expertise, and passion for a clean energy future to lay out the path to stop global warming and gain energy independence.

When Deng Xiaoping introduced market reforms in the late 1970s, few would have imagined what the next four decades would bring. China's GDP has grown on average nearly 10 percent annually since, and its economy is now the second largest in the world. Forty years ago, the Flying Pigeon bicycle ruled the roads; today, China is the world's largest car market. And if forty years ago you looked out across the Huangpu River from the Bund in Shanghai, you would have seen farmland and a few warehouses and wharves; now you see the stunning, futuristic cityscape of Pudong. The material progress of the past forty years has been staggering -- a source of pride for the Chinese people, as well as a source of legitimacy for the ruling Chinese Communist Party. But that progress has come at great cost: the extreme pollution of China's air, water, and soil has taken a stark toll on human health. In Environmental Pollution in China: What Everyone Needs to Know®, Daniel K. Gardner examines the range of factors -- economic, social, political, and historical -- contributing to the degradation of China's environment. He also covers the public response to the widespread pollution; the measures the government is taking to clean up the environment; and the country's efforts to lessen its dependence on fossil fuels and develop clean sources of energy. Concise, accessible, and authoritative, this book serves as an ideal primer on one of the world's most challenging environmental crises.

Prepared with the Energy Research Institute, this paper analyses Thailand's approach to renewable power development, its success factors, and lessons that could be applied to Vietnam. Thailand and Vietnam's power sectors share many important attributes, including vertically integrated power industry structure, rapid load growth, and the need to secure new and diversified sources of electric power. Compared to Vietnam, however, Thailand has made impressive progress with renewable energy development, as is evidenced by the considerable deployment of renewable energy to date and

various incentive mechanisms to increase the share of renewable energy in its fuel mix. This paper identifies four fundamental building blocks of Thailand's renewable energy progress and argues that future success will rely on developing a strong linkage between renewable energy policy and renewable industrial development policy. The four building blocks include policy framework, financial mechanism, regulatory framework, and capacity building. The paper then uses the lessons learned in Thailand as a basis for making recommendations for future Vietnamese renewable energy policy and support measures.

For multi-user PDF licensing, please contact customer service. Energy touches our lives in countless ways and its costs are felt when we fill up at the gas pump, pay our home heating bills, and keep businesses both large and small running. There are long-term costs as well: to the environment, as natural resources are depleted and pollution contributes to global climate change, and to national security and independence, as many of the world's current energy sources are increasingly concentrated in geopolitically unstable regions. The country's challenge is to develop an energy portfolio that addresses these concerns while still providing sufficient, affordable energy reserves for the nation. The United States has enormous resources to put behind solutions to this energy challenge; the dilemma is to identify which solutions are the right ones. Before deciding which energy technologies to develop, and on what timeline, we need to understand them better. America's Energy Future analyzes the potential of a wide range of technologies for generation, distribution, and conservation of energy. This book considers technologies to increase energy efficiency, coal-fired power generation, nuclear power, renewable energy, oil and natural gas, and alternative transportation fuels. It offers a detailed assessment of the associated impacts and projected costs of implementing each technology and categorizes them into three time frames for implementation.

This study presents options to fully unlock the world’s vast solar PV potential over the period until 2050. It builds on IRENA’s global roadmap to scale up renewables and meet climate goals.

This book, first published in 1992, provides clear data and analysis which will be vital to the energy research community.

If technology is an undeniable catalyst for progress, then energy is its inevitable basic food. It is no coincidence that since the industrial revolution, economic growth has been fuelled first by coal, then by oil & gas. Although energy intensity reserves are still sizeable in emerging economies and the technological catalyst can partially dematerialize growth, it is unrealistic to separate growth from its basic food. And, even if the “fossil energies share” (oil/gas/coal) will lose a few percent to nuclear and renewable energies over the next decades, all the indicators point to a world mix in which the fossil energy share will still top 75% by 2035. Driven by growth in emerging countries, the demand for oil and gas will continue to grow steadily. Even if there are enough oil and gas reserves to see us through the next three decades, will the industry be able to exploit and produce new resources that are increasingly complex to develop at a sufficient rate and which are often located in politically unstable countries? Not to mention the added challenge of the growing numbers of stakeholders who are increasingly insistent on industrial safety, environment and societal issues? In particular, will non-conventional resources, whose production growth could defer the oil & gas peaks by several decades, be able to withstand political and environmental lobbies? The evolution of oil & gas landscape over the past few years reveals a disturbing increase in the time required to develop large new fields and an accelerated decline of the production base due to the ageing of most of the mature-field facilities. This book aims to analyze all the critical factors (technical, political, economic, social and human) that could potentially accelerate or delay the maintenance and redevelopment of mature producing fields as well as the discovery and development of new conventional and unconventional resources. Insofar as in 2035, oil and gas still account for more than half of the world primary energy consumption, the appropriate management of these critical factors is crucial to ensuring, at least in the medium term, the ”Grail of Growth”. However, the hope of achieving the 450 ppm targets of Copenhagen has been shattered – bad news for the human population which is becoming more concerned with ensuring its short-term growth than with its long-term survival. Our energy future is not set in stone. Contents : 1. The food of growth. 2. Limiting the decline of the basement. 3. The increasing complexity of new developments. 4. Reaching excellence in safety. 5. Obtaining an environmental and social license to operate. 6. The “Energy” of the “Energy”. 7. Our energy future is not set in stone.

An Efficient Energy Future: Prospects for Europe and North America is a two-part book exploring the energy problems and policies for Europe and North America. The first part deals with energy demand problems and policies of the countries; two possible energy futures based on the scenarios of the MEDEE model; and energy demand projections for specific sectors: buildings, transport, and industry. The second part presents a collection of relevant energy demand indicators for the housing, transport, and industry sectors for all 17 covered countries.

Good Energy delivers a declaration that renewable energy can be beautiful, affordable, and easy to implement. Jared Green highlights thirty-five case studies from around the world, featuring a wide array of designs and building types that achieve good energy, good design, and excellent cost-efficiency. Single-family homes, townhouses, community spaces, schools, offices, and even power plants demonstrate that relying on solar, wind, and geothermal energy doesn't have to cost more. Each inspiring design harmonizes nature, technology, and democratic space and shows that renewable energy can be appealing and accessible to everyone. An interview with Mark Z. Jacobson, Stanford University professor of civil and environmental engineering and cofounder of the Solutions Project, discusses pathways to 100-percent renewable energy around the globe through good design.

The Green Solar Cities, EU-Concerto project focuses on the practical large scale implementation of solar energy technologies in combination with new build and retrofit low energy building in the cities of Copenhagen, with its city part Valby, in Denmark and Salzburg in Austria. This book aims to influence decision makers in European cities towards a similar approach to the Green Solar Cities project, in close cooperation with leading building component suppliers, energy companies and engaged builders also working with local city officials. This book will benefit those in a situation where many cities aim at a "Smart City" development, but without clear policies of how to achieve that in practice. In Denmark there are similar policies, with an overall aim to be CO2 neutral by year 2025 in the city of Copenhagen. However, there is still a lack of understanding concerning, how solar energy as the world’s number one energy source can play a major role here and how this can be combined with energy efficiency policies, use of district heating and combined heat and power. The general aim is to introduce the international "Active House" standard and work on "Active Roofs" of the future. The connection between solar energy and low energy building and energy renovation is

aimed to be ensured by help of the "Active House" standard which has been developed in cooperation with a number of leading building component manufacturers in Europe.
East Asia has experienced the fastest economic growth in the world over the last three decades, accompanied by a 10-fold gross domestic product increase and rapid urbanization. Energy consumption has more than tripled during this period and is expected to double over the next 20 years. This remarkable trend has led to twin energy challenges in the region environmental sustainability and energy security. Written for an audience of energy policy makers and practitioners, Winds of Change explores the region s energy future over the next two decades through two energy scenarios. It outlines the strategic direction East Asia s energy sector must take to meet its growing energy demand in an environmentally sustainable manner, and presents a pathway of policy frameworks and financing mechanisms to get there. The six East Asian countries China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam examined in this book could, with the right policies and financing, stabilize CO2 emissions by 2025, improve their local environment, and enhance energy security without compromising economic growth. They must move their energy sectors toward much higher efficiency and more widespread use of low-carbon technologies, while obtaining substantial financing and low-carbon technologies from developed countries. This clean energy revolution requires major policy and institutional reforms, including energy pricing reforms, regulations such as energy efficiency standards, financial incentives such as feed-in tariffs for renewable energy, and accelerated research and development. Finally, building low-carbon cities will be key to containing the rapid urban energy growth through compact urban design, public transport, clean vehicles, and green buildings. The window of opportunity is closing fast delaying action would lock the region into a longlasting high-carbon infrastructure. The technical and policy means exist for such transformational changes, but only strong political will and unprecedented international cooperation will make them happen.

A Wiley Survival Guide on our Energy Future Concerned about our energy future? Turn to this guide for easy-to-grasp and up-to-date coverage of the many aspects of the energy value chain: Oil and natural gas Coal Fossil fuels and the greenhouse effect Energy from water Biomass Solar energy Geothermal energy Wind energy Nuclear energy Electricity Energy storage Transportation Housing Smart energy consumption Hydrogen Armed with the knowledge in this book, students, teachers, decision-makers, politicians, and consumers can form educated and informed opinions on the future of energy and its impact on the economy, health, and the environment.
At a time when climate-change deniers hold the reins of power in the United States and international greenhouse gas negotiations continue at a slow crawl, what options are available to cities, companies, and consumers around the world who seek a cleaner future? Scott Victor Valentine, Marilyn A. Brown, and Benjamin K. Sovacool explore developments and strategies that will help fast-track the transition to renewable energy. They provide an expert analysis of the achievable steps that citizens, organizational leaders, and policy makers can take to put their commitments to sustainability into practice. Empowering the Great Energy Transition examines trends that suggest a transition away from carbon-intensive energy sources is inevitable—there are too many forces for change at work to stop a shift to clean energy. Yet under the status quo, change will be too slow to avert the worst consequences of climate change. Humanity is on a path to incur avoidable social, environmental, and economic costs. Valentine, Brown, and Sovacool argue that new policies and business models are needed to surmount the hurdles separating the current consumption model from a sustainable energy future. Empowering the Great Energy Transition shows that with well-placed efforts, we can set humanity on a course that supports entrepreneurs and communities in mitigating the environmental harm caused by technologies whose time has come and gone.
Points out the importance of the world's energy supply in shaping global politics, and argues that the energy source of the future should be natural gas in the form of shale deposits.

DIGITAL CITIES ROADMAP This book details applications of technology to efficient digital city infrastructure and its planning, including smart buildings. Rapid urbanization, demographic changes, environmental changes, and new technologies are changing the views of urban leaders on sustainability, as well as creating and providing public services to tackle these new dynamics. Sustainable development is an objective by which the processes of planning, implementing projects, and development is aimed at meeting the needs of modern communities without compromising the potential of future generations. The advent of Smart Cities is the answer to these problems. Digital Cities Roadmap provides an in-depth analysis of design technologies that lay a solid foundation for sustainable buildings. The book also highlights smart automation technologies that help save energy, as well as various performance indicators needed to make construction easier. The book aims to create a strong research community, to have a deep understanding and the latest knowledge in the field of energy and comfort, to offer solid ideas in the nearby future for sustainable and resilient buildings. These buildings will help the city grow as a smart city. The smart city has also a focus on low energy consumption, renewable energy, and a small carbon footprint. Audience The information provided in this book will be of value to researchers, academicians and industry professionals interested in IoT-based architecture and sustainable buildings, energy efficiency and various tools and methods used to develop green technologies for construction in smart cities.
Building a new America with Christ's Values provides solutions to our most critical problems: the need to create enough sustainable jobs, the need to shift to solar, wind and, hydrogen power before oil is unaffordable or unavailable, and finally the need to stop destructive climate change. The Department of Defense has instructed the military that they must be independent of oil by 2040. There is hope for an abundant future, but only if we: Develop a national energy and transportation plan and proceed with rapid implementation to stop burning fossil fuels. Shift resources from the Military Industrial Complex to a Nation Building at Home Complex. Establish a new business model and banking model as provided by the Mondragon Cooperative Corporation, which is worker owned. Follow Christ's teaching: "As I have loved you, love one another.""
An oil & gas industry expert breaks down America’s energy situation and how Americans can get involved to help develop an energy plan. It’s time for an energy revolution! Gasoline prices have been rising, and oil supply disruptions are in question. This is old news, yet nothing has been done to change it. That is because it takes people like you stepping up and getting involved, and Mark A. Stansberry is here to show you how. In his latest book, America Needs America’s Energy, Stansberry offers a frank discussion of the issues at hand, as well as realistic, achievable solutions. America cannot move forward without your involvement and your commitment to develop an energy plan. Presented in direct, no-nonsense language and containing a glossary, sample forms, and other resources on things you need to know about America’s energy situation, America Needs America’s En-

ergy is both a great go-to guide for learning about energy solutions and a wonderful launchpad for how to move forward together in creating the People’s Energy Plan. Praise for Mark A. Stansberry and America Needs America’s Energy “Through his many years of experience, Mark Stansberry successfully challenges us toward developing a comprehensive American energy plan.” —Bill Anoatubby, Governor, the Chickasaw Nation “As Mark states, “The time has come for all of us, the people, to take control of our energy future here in America.” He and I have discussed the importance of moving inevitably toward a hydrogen economy. I believe, after reviewing all the energy options presented in his book, it should move us closer to achieving that possibility. The future is now for us and our children. We cannot wait any longer.” —Woodrow W. Clark II, MA, PhD; Qualitative economist, Clark Strategic Partners; Corecipient of the Nobel Peace Prize “America’s energy policy cannot simply be cheap energy. Mark Stansberry tells us how to break out and assume an energy-secure and dynamic future economy.” —Frank Keating, Governor of Oklahoma, 1995-2003; President, American Bankers Association

Hitting the Wall examines the combination of two intractable energy problems of our age: the peaking of global oil production and the overloading of the atmosphere with greenhouse gases. Both emerge from the overconsumption of fossil fuels and solving one problem helps solve the other. The misinformation campaign about climate change is discussed as is the role that noncarbon energy solutions can play. There are nine major components in the proposed noncarbon strategy including energy efficiency and renewable energy. Economics and realistic restraints are considered and the total carbon reduction by 2030 is evaluated, and the results show that this strategy will reduce the carbon emission in the United States to be on track to an 80% reduction in 2050. The prospects for “clean” coal and “acceptable” nuclear are considered, and there is some hope that they would be used in an interim role. Although there are significant technical challenges to assembling these new energy systems, the primary difficulty lies in the political arena. A multigenerational strategy is needed to guide our actions over the next century. Garnering long-term multiadministration coherent policies to put the elements of any proposed strategy in place, is a relatively rare occurrence in the United States. More common is the reversal of one policy by the next administration with counterproductive results. A framework for politically stable action is developed using the framework of “energy tribes” where all the disparate voices in the energy debate are included and considered in a “messy process.” This book provides hope that our descendants in the next century will live in a world that would be familiar to us. This can only be achieved if the United States plays an active leadership role in maintaining climatic balance. Table of Contents: Introduction / The End of Cheap Oil / Carbon - Too Much of a Good Thing / Carbonless Energy Options / Conventional Energy / Policy for Whom? / Call to Arms / References

"The United States faces a critical challenge to transform our current fossil fuel based energy economy to a stable and sustainable energy economy. This transformation must be achieved in a timely manner to increase U.S. energy independence, enhance environmental stewardship and reduce energy and carbon intensity, and generate continued economic growth. In this report, the National Science Board (Board) offers key findings, recommendations to the U.S. Government, and guidance to the National Science Foundation (NSF). Collectively, these actions will initiate and sustain a transformation to a sustainable energy economy. The following six topics of key findings support and form the basis of the Board's recommendations and guidance: Finding 1: U.S. Government leadership and coordination: A comprehensive coordinated Federal strategy is required for sustainable energy initiatives. Finding 2: R & D investment: Private and Federal support for sustainable energy R & D is inadequate. Finding 3: Policy development: The U.S. energy economy is carbon-intensive and does not adequately value the environment as a public good. Finding 4: Energy education and workforce: Human capital development in the sustainable energy sector is vital. Finding 5: Global cooperation: Limited international engagement and collaboration inhibits progress on sustainable energy solutions. Finding 6: Energy awareness and action: Strong public consensus and support for sustainable energy actions are needed to achieve a national transformation to a sustainable energy economy."--Excerpted from Executive summary, p. 1.

The new threshold for green building is not just low energy, it's net-zero energy. In The New Net Zero, sustainable architect Bill Maclay charts the path for designers and builders interested in exploring green design's new-frontier net-zero-energy structures that produce as much energy as they consume and are carbon neutral. In a nation where traditional buildings use roughly 40 percent of the total fossil energy, the interest in net-zero building is growing enormously--among both designers interested in addressing climate change and consumers interested in energy efficiency and long-term savings. Maclay, an award-winning net-zero designer whose buildings have achieved high-performance goals at affordable costs, makes the case for a net-zero future; explains net-zero building metrics, integrated design practices, and renewable energy options; and shares his lessons learned on net-zero teambuilding. Designers and builders will find a wealth of state-of-the-art information on such considerations as air, water, and vapor barriers; embodied energy; residential and commercial net-zero standards; monitoring and commissioning; insulation options; costs; and more. The comprehensive overview is accompanied by several case studies, which include institutional buildings, commercial projects, and residences. Both new-building and renovation projects are covered in detail. The New Net Zero is geared toward professionals exploring net-zero design, but also suitable for non-professionals seeking ideas and strategies on net-zero options that are beautiful and renewably powered.

This is a print on demand edition of a hard to find publication. The U.S. faces a critical challenge to transform our current fossil fuel based energy economy to a sustainable energy economy. This transformation must be achieved to increase U.S. energy independence, enhance environ. stewardship and reduce energy and carbon intensity, and generate continued economic growth. These are the six topics in this report: 1: A comprehensive Fed. strategy. 2: Private and Fed. support for sustainable energy R&D is inadequate. 3: The U.S. energy economy does not value the environ. as a public good. 4: Human capital development in the sustainable energy sector is vital. 5: Limited internat. engagement inhibits progress. 6: Public support for sustainable energy is needed to get to a sustainable energy economy. Illustrations.

Permaculture is a sustainability buzzword, but many people wonder what it actually means and why it is relevant. Originally coined by combining the words permanent and agriculture, permaculture has evolved into an optimistic approach connecting all the systems of human life: gardening, housing, transportation, energy, and how we structure our communities. The Permaculture Promise explains in simple terms why permaculture may be the key to unlocking a livable future on our planet.

Author Jono Neiger asserts that humans can thrive while simultaneously making Earth healthier and not destroying it. The book shows 22 ways that permaculture can create a better future for all living things. Profiles of people and communities — including an urban dweller who tore up her driveway to create a vegetable garden and a California housing development that dedicates a third of its land to parks, orchards, and gardens — will inspire you to incorporate permaculture principles into your life today.

Truly comprehensive in scope - and arranged in A-Z format for quick access - this eight-volume set is a one-source reference for anyone researching the historical and contemporary details of more than 170 major issues confronting American society. Entries cover the full range of hotly contested social issues - including economic, scientific, environmental, criminal, legal, security, health, and media topics. Each entry discusses the historical origins of the problem or debate; past means used to deal with the issue; the current controversy surrounding the issue from all perspectives; and the near-term and future implications for society. In addition, each entry includes a chronology, a bibliography, and a directory of Internet resources for further research as well as primary documents and statistical tables highlighting the debates.