over the next few decades we will see a profound energy transformation as society shifts from fossil fuels to renewable resources like solar wind biomass but what might a one hundred percent renewable future actually look like and what obstacles will we face in this transition authors explore the practical challenges and opportunities presented by the shift to renewable energy page 4 of cover in order to promote the sustainable development of renewable energy and renewable energy driven technologies renewable energy driven future technologies modelling applications sustainability and policies provides a comprehensive view of the advanced renewable technologies and the benefits of utilizing renewable energy sources discussing the ways for promoting the sustainable development of renewable energy from the perspectives of technology modelling application sustainability and policy this book includes the advanced renewable energy driven technologies the models for renewable energy planning and integration the innovative applications of renewable energy sources decision support tools for sustainability assessment and ranking of renewable energy systems and the regulations and policies of renewable energy this book can benefit the researchers and experts of renewable energy by helping them to have a holistic view of renewable energy it can also benefit the policymakers and decision makers by helping them to make informed decisions presents the advanced renewable energy driven technologies and the innovative applications of renewable energy sources develops the models for the efficient use of renewable energy decision making and the investigation of its climate and economic benefits investigates the sustainability of renewable energy systems features the regulations and policies of renewable energy how do we heat our homes light our rooms and power our cars with energy in 2014 the united states relied on fossil fuels for about 67 percent of its power but as the fossil fuel supply dwindles and climate change becomes an increasingly urgent issue individuals businesses and governments are expanding their sources of renewable energy including solar wind biofuel hydro and geothermal in renewable energy discover the fuel of the future readers ages 9 to 12 learn about these renewable energy sources and discover how sunshine can be used to power light bulbs and how the earth s natural heat can be used to warm our houses young readers weigh the pros and cons of different energy sources and make their own informed opinions about which resources are the best choices for different uses renewable energy industries provide a booming field for future scientists and engineers this book shows kids these future jobs and gets them excited about contributing to a world run on clean energy hands on projects essential questions links to online primary sources and science minded prompts to think more about energy the environment and the repercussions of our choices make this book a key addition to classrooms and libraries our energy future is an introductory textbook for the study of energy production alternative and renewable fuels and ways to build a sustainable energy future jones and mayfield explore the creation and history of fossil fuels their impact on the environment and how they have become critical to our society the authors also outline how adopting sustainable biofuels will be key to the future of energy stability and discuss a number of renewable energy options and biofuel feedstocks that are replacements for petroleum based products our society is consuming energy at an alarming rate and the authors warn that continuing fuel usage patterns could permanently damage the environment this book emphasizes the importance of continued scientific agricultural and engineering development while it outlines the political and environmental challenges that will accompany a complete shift from fossil fuels to renewable energy and biomass our
energy future is an accessible resource for undergraduate students studying biofuels and bioenergy. Future energy will allow us to make reasonable logical and correct decisions on our future energy as a result of two of the most serious problems that the civilized world has to face: the looming shortage of oil which supplies most of our transport fuel and the alarming rise in atmospheric carbon dioxide over the past 50 years resulting from the burning of oil, gas, and coal. The loss of forests that threatens to change the world's climate through global warming. Future energy focuses on all the types of energy available to us taking into account a future involving a reduction in oil and gas production and the rapidly increasing amount of carbon dioxide in our atmosphere. It is unique in the genre of books of similar title in that each chapter has been written by a scientist or engineer who is an expert in his or her field. The book is divided into four sections: traditional fossil fuel and nuclear energy, renewable energy, potentially important new types of energy, and new aspects to future energy usage. Each chapter highlights the basic theory and implementation scope problems and costs associated with a particular type of energy. The traditional fuels are included because they will be with us for decades to come, but we hope in a cleaner form. The renewable energy types include: wind power, wave power, tidal energy, two forms of solar energy, biomas, hydroelectricity, geothermal, and the hydrogen economy. The traditional fuels are included because they will be with us for decades to come, but we hope in a cleaner form. The renewable energy types include wind power, wave power, tidal energy, two forms of solar energy, biomas, hydroelectricity, geothermal, and the hydrogen economy. The traditional fuels are included because they will be with us for decades to come, but we hope in a cleaner form. The renewable energy types include wind power, wave power, tidal energy, two forms of solar energy, biomas, hydroelectricity, geothermal, and the hydrogen economy. The traditional fuels are included because they will be with us for decades to come, but we hope in a cleaner form. The renewable energy types include wind power, wave power, tidal energy, two forms of solar energy, biomas, hydroelectricity, geothermal, and the hydrogen economy. The traditional fuels are included because they will be with us for decades to come, but we hope in a cleaner form. The renewable energy types include wind power, wave power, tidal energy, two forms of solar energy, biomas, hydroelectricity, geothermal, and the hydrogen economy.
harm to wildlife populations explain recent advances in renewable power technologies identify urgent research needs at the intersection of renewables and wildlife conservation relevant to policy makers and industry professionals many of whom believe renewables are the best path forward as the world seeks to meet its expanding energy needs and wildlife conservationists many of whom are alarmed at the rate of renewables related habitat conversion this detailed book culminates with a chapter underscoring emerging opportunities in renewable energy ecology contributors edward b arnett b boroski regan dohm david drake sarah r fritts rachel greene steven m grodsky amanda m hale cris d hein rebecca r hernandez jessica a homyack henriette i jager nicole m kobanta james a martin christopher e moorman clint otto christine a ribic susan p rupp jake verschuyl lindsay m wickman t bently wigley victoria h zero this book offers a unique insight into the corporate health of energy companies in an evolving landscape of deregulation cutting across both historical and present day situations it demonstrates important elements vital to the success of energy companies coming out of a safe regulated structure and dealing with a new competitive environment targeted at corporate executives energy professionals the financial and investment communities strategic planners and regulators readers will find this resource helpful to understand how energy companies can meet the challenges of a competitive environment what it will take to evolve into healthy energy companies the impacts of deregulation and assessment of successful and unsuccessful strategies for energy companies the role of technology in business product reinvention and a successful business model and the differences and similarities of electricity to other commodities the challenges to generation power delivery environmental science and end use sectors of the business using the principle that extracting energy from the environment always involves some type of impact on the environment the future of energy discusses the sources technologies and tradeoffs involved in meeting the world s energy needs a historical scientific and technical background set the stage for discussions on a wide range of energy sources including conventional fossil fuels like oil gas and coal as well as emerging renewable sources like solar wind geothermal and biofuels readers will learn that there are no truly green energy sources all energy usage involves some tradeoffs and will understand these tradeoffs and other issues involved in using each energy source each potential energy source includes discussions of tradeoffs in economics environmental and policy implications examples and cases of implementing each technology are included throughout the book technical discussions are supported with equations graphs and tables includes discussions of carbon capture and sequestration as emerging technologies to manage carbon dioxide emissions presents an overview on the different aspects of the energy value chain and discusses the issues that future energy is facing this book covers energy and the energy policy choices which face society the book presents easy to grasp information and analysis and includes statistical data for energy production consumption and simple formulas among the aspects considered are science technology economics and the impact on health and the environment in this new edition two new chapters have been added the first new chapter deals with unconventional fossil fuels a resource which has become very important from the economical point of view especially in the united states the second new chapter presents the applications of nanotechnology in the energy domain provides a global vision of available and potential energy sources discusses advantages and drawbacks to help prepare current and future generations to use energy differently includes new chapters covering unconventional fossil fuels and nanotechnology as new energy our energy future resources alternatives and the environment second edition is written for professionals students teachers decision makers and politicians involved in the energy domain and interested in environmental issues 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 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 energy production and use touch our lives in countless ways we are reminded of the cost of energy every time we fill up at the gas pump pay an electricity bill or purchase an airline ticket energy use also has important indirect impacts not all of which are reflected in current energy prices depletion of natural resources degradation of the environment and threats to national security arising from a growing dependence on geopolitically unstable regions for some of our energy supplies these indirect impacts could increase in the future if the demand for energy rises faster than available energy supplies our nation s challenge is to develop an energy portfolio that reduces these impacts while providing sufficient and affordable energy supplies to sustain our future economic prosperity the united states has enormous economic and intellectual resources that can be brought to bear on these challenges through a sustained national effort in the decades ahead america s energy future is intended to inform the development of wise energy policies by fostering a better understanding of technological options for increasing energy supplies and improving the efficiency of energy use this summary edition of the book will also be a useful resource for professionals working in the energy industry or involved in
advocacy and researchers in energy related fields of study america's energy future examines the deployment potential costs barriers and impacts of energy supply and end use technologies during the next two to three decades including energy efficiency alternative transportation fuels renewable energy fossil fuel energy and nuclear energy as well as technologies for improving the nation's electrical transmission and distribution systems the 4th phase focuses on clean energy technology evolution and where our energy system is going while its foundation is technology innovation it brings a unique perspective that technology alone is not what has brought about the explosive growth of renewable energy the book offers fresh insights into how technology economics social dynamics policy and geopolitics are forces at play affecting our energy future it builds off dr arent's lifelong passion for energy sustainable development and in particular renewable energy technologies dr arent's journey began in high school as a keen student of math and science watching the global oil crisis unfold in 1973 the us responded with a series of actions including establishing what was then called the solar energy research institute the idea of a renewable energy future stuck which dr arent follows as he covers the journey of technology evolution economics political economy and geopolitics of clean energy over the last 40 years and provides insights for the next decades from a technology perspective we'll trace the arc of recent innovations and synthesize innovations across multiple interacting perspectives into a description of our renewable energy future this translation of a german title which was enthusiastically received by a wide audience collects contributions by leading and well known scientists in the area explaining the technical basics of photovoltaic solar thermal energy wind and water power as well as geothermal energy in an easily accessible yet sober way the book offers a solid overview of the possibilities offered by environmentally friendly techniques energy conversion storage and transportation discussing the topic without any misplaced ideology the editors are experienced journalists and illustrate the text with simple diagrams and information boxes printed in full color throughout for applied physicists engineers in power technology engineers and anyone interested in natural sciences what will replace fossil fuel is there a way forward using renewable energy sources while avoiding nuclear power this book argues that nuclear is unlikely to have much of a role in future and shows that the pro and anti nuclear debate has absorbed too much time and energy over the years this has been to the detriment of a more relevant interesting and increasingly urgent debate over what sort of renewable efficiency mix we need this book engages in that debate exploring the implications of shifting to greener cleaner energy sources importantly david elliott argues there is no one green future there is a range of possible options of various types and scales we need to choose amongst them this book offers an overview of the technical economic and environmental issues to help scholars professionals and policy makers involved in discussing those options hydrogen linked with clean renewable sources of energy provides the prescription for the ills of an ailing planet geoffrey b holland and james j provencano's hallmark book the hydrogen age details just how this remarkable energy carrier has been vital to the workings of the universe since the beginning of time and why it is now ready to play a central part in healing our earth our atmosphere and the world's economies as a clean energy commodity book jacket a component in the america's energy future study electricity from renewable resources examines the technical potential for electric power generation with alternative sources such as wind solar photovoltaic geothermal solar thermal hydroelectric and other renewable sources the book focuses on those renewable sources that show the most promise for initial commercial deployment within 10 years and will lead to a substantial impact on the us energy system a quantitative characterization of technologies this book lays out expectations of costs performance and impacts as well as barriers and research and development needs in addition to a principal focus on renewable energy technologies for power generation the book addresses the challenges of
incorporating such technologies into the power grid as well as potential improvements in
the national electricity grid that could enable better and more extensive utilization of wind
solar thermal solar photovoltaics and other renewable technologies. Dr. Daniel B. Botkin
objectively assesses the true prospects, limitations, costs, risks, dangers, and tradeoffs
associated with every leading and emerging source of energy including oil, natural gas, coal,
hydroelectric nuclear, wind, solar, ocean power, and biofuels. Next, Botkin addresses the
energy distribution system, outlining how it currently works, identifying its inefficiencies
and reviewing options for improving it. Finally, Botkin turns to solutions, offering a realistic
scientifically and economically viable path to a sustainable energy-independent future one
that can improve the quality of life for Americans and for people around the world. The
future of fossil fuels: what can we realistically expect from oil, gas, and coal? Will alternative
energy sources really matter? Running the numbers on solar, wind, biofuels, and other
renewables must we all wear sweaters and live in caves? The right role for efficiency
why energy minimalism isn’t the solution where we can start and what will happen if we
don’t have a magic bullet but there are sensible, realistic solutions. The manner in which we
produce and use energy is of crucial importance to sustainable development as energy
has deep relationships with each of its three dimensions: the economy, the environment,
and social welfare. These relationships develop in a fast moving, complex situation
characterized by increasing globalization, growing market liberalization, new technologies,
as well as by growing concerns about climate change. In order to make energy an
integral part of sustainable development, new policies need to be developed. Such policies
must strike a balance among the three dimensions of sustainable development; they must
reduce our exposure to large-scale risks. The IEA has synthesized a number of experiences
with policies aimed to promote sustainable development; these experiences are reported in
seven subject chapters on energy supply, security market reform, improving energy
efficiency, renewable energies, sustainable transport, flexibility, mechanisms for greenhouse
gas reductions on non-member countries. We don’t have an energy crisis; we have a
consumption crisis, and this book, which takes aim at cherished assumptions regarding
energy offers refreshingly straight talk about what’s wrong with the way we think and talk
about the problem. Though we generally believe we can solve environmental problems
with more energy, more solar cells, wind turbines, and biofuels, alternative technologies
come with their own side effects and limitations. How, for instance, do solar cells cause
harm? Why can’t engineers solve wind power’s biggest obstacle? Why won’t contraception
solve the problem? Lying at the heart of our concerns about energy and what will this
practical, environmentally informed, and lucid book persuasively argues for a change of
perspective. If consumption is the problem, as Ozzie Zehner suggests, then we need to shift
our focus from suspect alternative energies to improving social and political fundamentals:
walkable communities, improved consumption, enlightened governance, and most notably
women’s rights. The dozens of first steps he offers are surprisingly straightforward:
instance, he introduces a simple sticker that promises a greater impact than all of the nation’s
solar cells. He uncovers why carbon taxes won’t solve our energy challenges, and presents
two taxes that could finally help explore how future environmentalists will focus on similarly
fresh alternatives that are affordable, clean, and can actually improve our well-being.
Watch a book trailer. 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 stabilize CO2 emissions by 2025 and improve their local environment. They must move their energy sectors toward higher efficiency and more widespread use of low-carbon technologies. 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 long-lasting 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.

This translation of a German title, which was enthusiastically received by a wide audience, collects contributions by leading and well-known scientists in the area explaining the technical basics of photovoltaic solar, thermal energy, wind, and water power as well as geothermal energy in an easily accessible yet sober way. The book offers a solid overview of the possibilities offered by environmentally friendly techniques for energy conversion, storage, and transportation, discussing the topic without any misplaced ideology.

The editors are experienced journalists and illustrate the text with simple diagrams and information boxes printed in full color throughout, making it accessible for engineers and anyone interested in natural sciences. Winner of the 2017 EdRA Great Places Award for Research, the Renewable Energy Landscape is a definitive guide to understanding and avoiding scenic impacts as we transition to a more renewable energy future. It focuses attention for the first time on the unique challenges of solar, wind, and geothermal energy for landscape protection, planning, and management. Topics addressed include policies aimed at managing scenic impacts from renewable energy development and their social acceptance in North America, Europe, and Australia. Visual characteristics of energy facilities, including design and planning techniques for avoiding or mitigating impacts or improving visual fit methods, are discussed, along with assessing visual impacts or energy projects and the best practices for creating and using visual simulations. Policy recommendations for political and regulatory bodies are provided.

A comprehensive and practical book, the Renewable Energy Landscape is an essential resource for those engaged in planning, designing, or regulating the impacts of these new, critical energy sources. It will appeal to a range of readers without scientific backgrounds in this critical area of the America’s Energy Future Study. Electricity from renewable resources examines the technical potential for electric power generation with alternative sources such as wind, solar, photovoltaic, geothermal, solar thermal, and hydroelectric, and other renewable sources. The book focuses on those renewable sources that show the most promise for initial commercial deployment within 10 years and will lead to a substantial impact on the U.S. energy system.
this book lays out expectations of costs performance and impacts as well as barriers and research and development needs in addition to a principal focus on renewable energy technologies for power generation the book addresses the challenges of incorporating such technologies into the power grid as well as potential improvements in the national electricity grid that could enable better and more extensive utilization of wind solar thermal solar photovoltaics and other renewable technologies given the backdrop of intense interest and widespread discussion on the prospects of a hydrogen energy economy this book aims to provide an authoritative and up to date scientific account of hydrogen generation using solar energy and renewable sources such as water while the technological and economic aspects of solar hydrogen generation are evolving the scientific principles underlying various solar assisted water splitting schemes already have a firm footing this book aims to expose a broad based audience to these principles this book spans the disciplines of solar energy conversion electrochemistry photochemistry photoelectrochemistry materials chemistry device physics engineering and biology argues that america can and must move away from our dependence on oil and other fossil fuels and toward a new energy future by tapping into our abundant supplies of clean renewable home grown energy sources and by deploying our technological know how to use energy more efficiently 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 nonprofessionals seeking ideas and strategies on net zero options that are beautiful and renewably powered today another profound transformation is underway a combination of forces is taking us from a carbon centric inefficient energy system to one that emphasizes efficiency and draws from diverse energy sources including the sun in 2012 more than half of total net additions to global electric generating capacity came from renewable sources since 2008 u s electricity generation from wind and solar power has more than doubled sharp and largely unforeseen growth in the u s shale gas market has altered the dynamics of the global energy landscape and helped spark a renaissance in u s manufacturing these changes together with improvements in energy efficiency and a changing transportation sector have contributed to a drop in u s carbon emissions which hit a 20 year low in 2012 at the same time the business of energy is changing from one focused on kilowatt hours to one focused on services the roles that distribution and transmission play could change dramatically as we move toward an energy system that is more diverse more dispersed and more carbon neutral energy is becoming a more essential component of strategies to safeguard and improve our security economy and environment as the u s energy department s only national laboratory focused on renewable energy and energy efficiency the national renewable energy laboratory nrel is uniquely positioned to help inform and guide energy
System transformation NREL complements its scientific research with high quality credible technology neutral and objective analysis that spans the entire energy portfolio to inform policy and investment decisions as renewable energy and energy efficiency technologies move from concept to commercialization to market penetration for 35 years our work with the public and private sectors has catalyzed the emergence of a clean energy industry that is creating jobs and providing viable low carbon energy options at home and around the world 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 energy in america is undergoing a period of rapid change driven by new technologies consumer empowerment and the imperative to reduce emissions that cause global warming but many utilities are dragging their feet or actively impeding progress people who want to save energy or install solar panels are finding their efforts at odds with utilities seeking to preserve their profits seeing an existential threat to their business model utilities across the country are pursuing policy changes that will make it less viable for customers to generate their own electricity impatient with the slow pace of change an increasing number of cities are taking matters into their own hands as their citizens seek energy that is local affordable and clean empowered describes how city officials and activists in boulder minneapolis and madison are fighting back against entrenched utilities and taking charge of their energy future a nobel laureate imagines the technolgies that will allow us to harness alternative fuel sources and power society despite the lack of carbon based fuels in an intriguing look at two centuries into the future an interdisciplinary approach brings together economic social environmental and policy issues to give you a holistic view of this multi faceted subject area chapters explore the full range of renewable energy technologies including solar thermal solar photovoltaics bioenergy in all its forms hydroelectricity tidal power wind energy wave energy and deep geothermal energy beautiful illustrations augment the text while tables boxed examples and online end of chapter exercises enrich your learning experience new to this edition a new chapter on thermodynamics provides a useful primer for understanding renewable heat energy technologies an updated chapter explores the status of challenges and opportunities for the integration of renewable energy technologies in rapidly evolving electric grid systems a new chapter on renewable energy futures looks ahead to potential developments in this ever advancing field and enhanced pedagogy that includes more comprehensive chapter summaries page 4 of cover there is a growing sense of national urgency about the role of energy in long term u s economic vitality national security and climate change this urgency is the consequence of many factors including the rising global demand for energy the need for long term security of energy supplies especially oil growing global concerns about carbon dioxide emissions and many other factors affected to a great degree by government policies both here and abroad on march 13 2008 the national academies brought together many of the most knowledgeable and influential people working on energy issues today to discuss how we can meet the need for energy without irreparably damaging earth s environment or compromising u s economic and national security a complex problem that will require technological and social changes that have few parallels in human history the national academies summit on america s energy future summary of a meeting chronicles that 2 day summit and serves as a current and far reaching foundation for examining
energy policy the summit is part of the ongoing project America's future energy technology opportunities risks and tradeoffs which will produce a series of reports providing authoritative estimates and analysis of the current and future supply of and demand for energy new and existing technologies to meet those demands their associated impacts and their projected costs the National Academies summit on America's future energy summary of a meeting is an essential base for anyone with an interest in strategic, tactical, and policy issues. Federal and state policy makers will find this book invaluable as will industry leaders, investors, and others willing to convert concern into action to solve the energy problem.
Our Renewable Future 2016-06-02 over the next few decades we will see a profound energy transformation as society shifts from fossil fuels to renewable resources like solar wind biomass but what might a one hundred percent renewable future actually look like and what obstacles will we face in this transition authors explore the practical challenges and opportunities presented by the shift to renewable energy page 4 of cover

Renewable-Energy-Driven Future 2020-09-16 in order to promote the sustainable development of renewable energy and renewable energy driven technologies renewable energy driven future technologies modelling applications sustainability and policies provides a comprehensive view of the advanced renewable technologies and the benefits of utilizing renewable energy sources discussing the ways for promoting the sustainable development of renewable energy from the perspectives of technology modelling application sustainability and policy this book includes the advanced renewable energy driven technologies the models for renewable energy planning and integration the innovative applications of renewable energy sources decision support tools for sustainability assessment and ranking of renewable energy systems and the regulations and policies of renewable energy this book can benefit the researchers and experts of renewable energy by helping them to have a holistic view of renewable energy it can also benefit the policymakers and decision makers by helping them to make informed decisions presents the advanced renewable energy driven technologies and the innovative applications of renewable energy sources develops the models for the efficient use of renewable energy decision making and the investigation of its climate and economic benefits investigates the sustainability of renewable energy systems features the regulations and policies of renewable energy

Renewable Energy 2016-04-18 how do we heat our homes light our rooms and power our cars with energy in 2014 the united states relied on fossil fuels for about 67 percent of its power but as the fossil fuel supply dwindles and climate change becomes an increasingly urgent issue individuals businesses and governments are expanding their sources of renewable energy including solar wind biofuel hydro and geothermal in renewable energy discover the fuel of the future readers ages 9 to 12 learn about these renewable energy sources and discover how sunshine can be used to power light bulbs and how the earth's natural heat can be used to warm our houses young readers weigh the pros and cons of different energy sources and make their own informed opinions about which resources are the best choices for different uses renewable energy industries provide a booming field for future scientists and engineers this book shows kids these future jobs and gets them excited about contributing to a world run on clean energy hands on projects essential questions links to online primary sources and science minded prompts to think more about energy the environment and the repercussions of our choices make this book a key addition to classrooms and libraries

Moving California Toward a Renewable Energy Future 1980 our energy future is an introductory textbook for the study of energy production alternative and renewable fuels and ways to build a sustainable energy future jones and mayfield explore the creation and history of fossil fuels their impact on the environment and how they have become critical to our society the authors also outline how adopting sustainable biofuels will be key to the future of energy stability and discuss a number of renewable energy options and biofuel feedstocks that are replacements for petroleum based products our society is consuming energy at an alarming rate and the authors warn that continuing fuel usage patterns could permanently damage the environment this book emphasizes the importance of continued scientific agricultural and engineering development while it outlines the political and environmental challenges that will accompany a complete shift from fossil fuels to renewable energy and biomass our energy future is an accessible resource for undergraduate students studying biofuels and bioenergy
Our Energy Future 2016-02-16 future energy will allow us to make reasonable logical and correct decisions on our future energy as a result of two of the most serious problems that the civilized world has to face the looming shortage of oil which supplies most of our transport fuel and the alarming rise in atmospheric carbon dioxide over the past 50 years resulting from the burning of oil gas and coal and the loss of forests that threatens to change the world’s climate through global warming future energy focuses on all the types of energy available to us taking into account a future involving a reduction in oil and gas production and the rapidly increasing amount of carbon dioxide in our atmosphere it is unique in the genre of books of similar title in that each chapter has been written by a scientist or engineer who is an expert in his or her field the book is divided into four sections traditional fossil fuel and nuclear energy renewable energy potentially important new types of energy energy new aspects to future energy usage each chapter highlights the basic theory and implementation scope problems and costs associated with a particular type of energy the traditional fuels are included because they will be with us for decades to come but we hope in a cleaner form the renewable energy types includes wind power wave power tidal energy two forms of solar energy bio mass hydroelectricity geothermal and the hydrogen economy potentially important new types of energy include pebble bed nuclear reactors nuclear fusion methane hydrates and recent developments in fuel cells and batteries written by experts in the key future energy disciplines from around the globe details of all possible forms of energy that are and will be available globally in the next two decades puts each type of available energy into perspective with realistic future options

Future Energy 2008-07-30 our energy future is an introductory textbook for a college course in energy production alternative and renewable fuels and related issues involved in building a sustainable energy future our society is consuming energy at an alarming rate as trends in energy consumption continue to rise jones and mayfield explore the creation and history of fossil fuels their impact on the environment and how they have become critical to our society they warn that continuing fuel usage patterns could permanently damage our environment jones and mayfield also outline how the adoption of sustainable biofuels will be key to our future energy stability they discuss a number of renewable energy options and then discuss different biofuel feedstocks and their potential as replacements for petroleum based products this book emphasizes the importance of continued scientific agricultural and engineering development while outlining the political and environmental challenges that are coupled with a complete shift from fossil fuels to renewable energy and biomass our energy future is an excellent accessible resource for undergraduate students studying biofuels and bioenergy provided by publisher

Our Energy Future 2016-02-16 brings together disparate conversations about wildlife conservation and renewable energy suggesting ways these two critical fields can work hand in hand renewable energy is often termed simply green energy but its effects on wildlife and other forms of biodiversity can be quite complex while capturing renewable resources like wind solar and energy from biomass can require more land than fossil fuel production potentially displacing wildlife habitat renewable energy infrastructure can also create habitat and promote species health when thoughtfully implemented the authors of renewable energy and wildlife conservation argue that in order to achieve a balanced plan for addressing these two crucially important sustainability issues our actions at the nexus of these fields must be directed by current scientific information related to the ecological effects of renewable energy production synthesizing an extensive rapidly growing base of research and insights from practitioners into a single comprehensive resource contributors to this volume describe processes to generate renewable energy focusing on the big four renewables wind bioenergy solar energy and hydroelectric power review the documented effects of renewable energy production on wildlife and wildlife habitats consider current and future policy directives suggesting ways industrial scale renewables production can be
developed to minimize harm to wildlife populations explain recent advances in renewable power technologies identify urgent research needs at the intersection of renewables and wildlife conservation relevant to policy makers and industry professionals many of whom believe renewables are the best path forward as the world seeks to meet its expanding energy needs and wildlife conservationists many of whom are alarmed at the rate of renewables related habitat conversion this detailed book culminates with a chapter underscoring emerging opportunities in renewable energy ecology contributors edward b arnett brian b boroski regan dohm david drake sarah r fritts rachel greene steven m grodsky amanda m hale cris d hein rebecca r hernandez jessica a homyack henriette i jager nicole m korfanta james a martin christopher e moorman clint otto christine a ribic susan p rupp jake verschuyl lindsay m wickman t bently wigley victoria h zero
Renewable Energy and Wildlife Conservation 2019-09-10 this book offers a unique insight into the corporate health of energy companies in an evolving landscape of deregulation cutting across both historical and present day situations it demonstrates important elements vital to the success of energy companies coming out of a safe regulated structure and dealing with a new competitive environment targeted at corporate executives energy professionals the financial and investment communities strategic planners and regulators readers will find this resource helpful to understand how energy companies can meet the challenges of a competitive environment what it will take to evolve into healthy energy companies the impacts of deregulation and assessment of successful and unsuccessful strategies for energy companies the role of technology in business product reinvention and a successful business model and the differences and similarities of electricity to other commodities the challenges to generation power delivery environmental science and end use sectors of the business
Visions for a Sustainable Energy Future 2020-11-26 using the principle that extracting energy from the environment always involves some type of impact on the environment the future of energy discusses the sources technologies and tradeoffs involved in meeting the world s energy needs a historical scientific and technical background set the stage for discussions on a wide range of energy sources including conventional fossil fuels like oil gas and coal as well as emerging renewable sources like solar wind geothermal and biofuels readers will learn that there are no truly green energy sources all energy usage involves some tradeoffs and will understand these tradeoffs and other issues involved in using each energy source each potential energy source includes discussions of tradeoffs in economics environmental and policy implications examples and cases of implementing each technology are included throughout the book technical discussions are supported with equations graphs and tables includes discussions of carbon capture and sequestration as emerging technologies to manage carbon dioxide emissions
The Future of Energy 2014-05-31 presents an overview on the different aspects of the energy value chain and discusses the issues that future energy is facing this book covers energy and the energy policy choices which face society the book presents easy to grasp information and analysis and includes statistical data for energy production consumption and simple formulas among the aspects considered are science technology economics and the impact on health and the environment in this new edition two new chapters have been added the first new chapter deals with unconventional fossil fuels a resource which has become very important from the economical point of view especially in the united states the second new chapter presents the applications of nanotechnology in the energy domain provides a global vision of available and potential energy sources discusses advantages and drawbacks to help prepare current and future generations to use energy differently includes new chapters covering unconventional fossil fuels and nanotechnology as new energy our energy future resources alternatives and the environment second edition is written for professionals students teachers decision makers and politicians involved in the
energy domain and interested in environmental issues

**The Nation's Energy Future** 2001 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

**Our Energy Future** 2016-03-14 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

**Hitting the Wall** 2022-06-01 energy production and use touch our lives in countless ways we are reminded of the cost of energy every time we fill up at the gas pump pay an electricity bill or purchase an airline ticket energy use also has important indirect impacts not all of which are reflected in current energy prices depletion of natural resources degradation of the environment and threats to national security arising from a growing dependence on geopolitically unstable regions for some of our energy supplies these indirect impacts could increase in the future if the demand for energy rises faster than available energy supplies our nation s challenge is to develop an energy portfolio that reduces these impacts while providing sufficient and affordable energy supplies to sustain our future economic prosperity the united states has enormous economic and intellectual resources that can be
brought to bear on these challenges through a sustained national effort in the decades ahead. America's energy future is intended to inform the development of wise energy policies by fostering a better understanding of technological options for increasing energy supplies and improving the efficiency of energy use. This summary edition of the book will also be a useful resource for professionals working in the energy industry or involved in advocacy and researchers and academics in energy related fields of study. America's energy future examines the deployment potential costs, barriers and impacts of energy supply and end use technologies during the next two to three decades including energy efficiency, alternative transportation fuels, renewable energy, fossil fuel energy, and nuclear energy as well as technologies for improving the nation's electrical transmission and distribution systems.

**America's Energy Future 2010-01-15**

The 4th phase focuses on clean energy technology evolution and where our energy system is going while its foundation is technology innovation. It brings a unique perspective that technology alone is not what has brought about the explosive growth of renewable energy. The book offers fresh insights into how technology economics, social dynamics, policy, and geopolitics are forces at play affecting our energy future. It builds off Dr. Arent's lifelong passion for energy sustainable development and in particular renewable energy technologies. Dr. Arent's journey began in high school as a keen student of math and science watching the global oil crisis unfold in 1973. The US responded with a series of actions including establishing what was then called the Solar Energy Research Institute. The idea of a renewable energy future stuck, which Dr. Arent follows as he covers the journey of technology evolution, economics, political economy, and geopolitics of clean energy over the last 40 years and provides insights for the next decades from a technology perspective. We'll trace the arc of recent innovations and synthesize innovations across multiple interacting perspectives into a description of our renewable energy future.

**America's Energy Future 2010-01-14**

This translation of a German title which was enthusiastically received by a wide audience collects contributions by leading and well-known scientists in the area explaining the technical basics of photovoltaic, solar thermal energy, wind, and water power as well as geothermal energy in an easily accessible yet sober way. The book offers a solid overview of the possibilities offered by environmentally friendly techniques. It covers energy conversion, storage, and transportation, discussing the topic without any misplaced ideology. The editors are experienced journalists and illustrate the text with simple diagrams and information boxes printed in full color throughout. It is for applied physicists, engineers in power technology, engineers, and anyone interested in natural sciences.

**Fourth Phase, The: Towards the Foundation of Our Future Energy System 2024-03-29**

What will replace fossil fuel and where is there a way forward utilizing renewable energy sources while avoiding nuclear power? This book argues that nuclear is unlikely to have much of a role in the future and shows that the pro and anti nuclear debate has absorbed too much time and energy over the years. This has been detrimental to a more relevant and increasingly urgent debate over what sort of renewable efficiency mix we need. This book engages in that debate exploring the implications of shifting to greener cleaner energy sources. Importantly, David Elliott argues there is no one green future. There is a range of possible options of various types and scales. We need to choose amongst them. This book offers an overview of the technical economic and environmental issues to help scholars, professionals, and policy makers involved in discussing those options.

**Renewable Energy 2011-11-28**

Hydrogen linked with clean renewable sources of energy provides the prescription for the ills of an ailing planet. Geoffrey B. Holland and James J. Provencano's hallmark book, *The Hydrogen Age*, details just how this remarkable energy carrier has been vital to the workings of the universe since the beginning of time and why it
is now ready to play a central part in healing our earth our atmosphere and the world's economies as a clean energy commodity book jacket

**Green Energy Futures: A Big Change for the Good** 2015-10-08 a component in the america's energy future study electricity from renewable resources examines the technical potential for electric power generation with alternative sources such as wind solar photovoltaic geothermal solar thermal hydroelectric and other renewable sources the book focuses on those renewable sources that show the most promise for initial commercial deployment within 10 years and will lead to a substantial impact on the u s energy system a quantitative characterization of technologies this book lays out expectations of costs performance and impacts as well as barriers and research and development needs in addition to a principal focus on renewable energy technologies for power generation the book addresses the challenges of incorporating such technologies into the power grid as well as potential improvements in the national electricity grid that could enable better and more extensive utilization of wind solar thermal solar photovoltaics and other renewable technologies

**The Hydrogen Age** 2007 dr daniel b botkin objectively assesses the true prospects limitations costs risks dangers and tradeoffs associated with every leading and emerging source of energy including oil natural gas coal hydroelectric nuclear wind solar ocean power and biofuels next botkin addresses the energy distribution system outlining how it currently works identifying its inefficiencies and reviewing options for improving it finally botkin turns to solutions offering a realistic scientifically and economically viable path to a sustainable energy independent future one that can improve the quality of life for americans and for people around the world the future of fossil fuels what can we realistically expect from oil gas and coal will alternative energy sources really matter running the numbers on solar wind biofuels and other renewables must we all wear sweaters and live in caves the right role for efficiency and why energy minimalism isn't the solution where we can start and what will happen if we don't have magic bullet but there are sensible realistic solutions

**Electricity from Renewable Resources** 2010-04-05 the manner in which we produce consume energy is of crucial importance to sustainable development as energy has deep relationships with each of its three dimensions the economy the environment social welfare these relationships develop in a fast moving complex situation characterized by increasing globalisation growing market liberalisation new technologies as well as by growing concerns about climate change energy supply security in order to make energy an integral part of sustainable development new policies need to be developed such policies must strike a balance among the three dimensions of sustainable development they must reduce our exposure to large scale risk the iea has synthesized a number of experiences with policies aimed to promote sustainable development these experiences are reported in seven subject chapters on energy supply security market reform improving energy efficiency renewable energies sustainable transport flexibility mechanisms for greenhouse gas reductions on non member countries

**Reliable, Affordable, and Environmentally Sound Energy for America's Future** 2001 we don't have an energy crisis we have a consumption crisis and this book which takes aim at cherished assumptions regarding energy offers refreshingly straight talk about what's wrong with the way we think and talk about the problem though we generally believe we can solve environmental problems with more energy more solar cells wind turbines and biofuels alternative technologies come with their own side effects and limitations how for instance do solar cells cause harm why can't engineers solve wind power's biggest obstacle why won't contraception solve the problem of overpopulation lying at the heart of our concerns about energy and what will this practical environmentally informed and lucid book persuasively argues for a change of perspective if consumption is the problem as ozzie zehner suggests then we need to shift our focus from suspect alternative energies to
improving social and political fundamentals walkable communities improved consumption enlightened governance and most notably women's rights the dozens of first steps he offers are surprisingly straightforward for instance he introduces a simple sticker that promises a greater impact than all of the nation's solar cells he uncovers why carbon taxes won't solve our energy challenges and presents two taxes that could finally he explores how future environmentalists will focus on similarly fresh alternatives that are affordable clean and can actually improve our well being watch a book trailer

**Powering the Future** 2010-03-23 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

**Scenarios for a Clean Energy Future** 2000 this translation of a german title which was enthusiastically received by a wide audience collects contributions by leading and well known scientists in the area explaining the technical basics of photovoltaic solar thermal energy wind and water power as well as geothermal energy in an easily accessible yet sober way the book offers a solid overview of the possibilities offered by environmentally friendly techniques energy conversion storage and transportation discussing the topic without any misplaced ideology the editors are experienced journalists and illustrate the text with simple diagrams and information boxes printed in full color throughout for applied physicists engineers in power technology engineers and anyone interested in natural sciences

**Toward a Sustainable Energy Future** 2001 winner of the 2017 edra great places award research category winner of the 2017 vt asla chapter award of excellence communications category the renewable energy landscape is a definitive guide to understanding assessing avoiding and minimizing scenic impacts as we transition to a more renewable energy future it focuses attention for the first time on the unique challenges solar wind and geothermal energy will create for landscape protection planning design and management topics addressed include policies aimed at managing scenic impacts from renewable energy development and their social acceptance within north america europe and australia visual characteristics of energy facilities including the design and planning techniques for avoiding or mitigating impacts or improving visual fit methods of assessing visual impacts or energy
projects and the best practices for creating and using visual simulations policy recommendations for political and regulatory bodies a comprehensive and practical book the renewable energy landscape is an essential resource for those engaged in planning designing or regulating the impacts of these new critical energy sources as well as a resource for communities that may be facing the prospect of development in their local landscape

**Green Illusions** 2012 one of the most important issues facing humanity today is the prospect of global climate change brought about primarily by our prolific energy use and heavy dependence on fossil fuels fueling our future an introduction to sustainable energy provides a concise overview of current energy demand and supply patterns it presents a balanced view of how our reliance on fossil fuels can be changed over time so that we have a much more sustainable energy system in the near future written in a non technical and accessible style the book will appeal to a wide range of readers without scientific backgrounds

**Winds of Change** 2010-06-24 a component in the america s energy future study electricity from renewable resources examines the technical potential for electric power generation with alternative sources such as wind solar photovoltaic geothermal solar thermal hydroelectric and other renewable sources the book focuses on those renewable sources that show the most promise for initial commercial deployment within 10 years and will lead to a substantial impact on the u s energy system a quantitative characterization of technologies this book lays out expectations of costs performance and impacts as well as barriers and research and development needs in addition to a principal focus on renewable energy technologies for power generation the book addresses the challenges of incorporating such technologies into the power grid as well as potential improvements in the national electricity grid that could enable better and more extensive utilization of wind solar thermal solar photovoltaics and other renewable technologies

**Renewable Energy** 2008-03-31 given the backdrop of intense interest and widespread discussion on the prospects of a hydrogen energy economy this book aims to provide an authoritative and up to date scientific account of hydrogen generation using solar energy and renewable sources such as water while the technological and economic aspects of solar hydrogen generation are evolving the scientific principles underlying various solar assisted water splitting schemes already have a firm footing this book aims to expose a broad based audience to these principles this book spans the disciplines of solar energy conversion electrochemistry photochemistry photoelectrochemistry materials chemistry device physics engineering and biology

**The Renewable Energy Landscape** 2016-08-19 argues that america can and must move away from our dependence on oil and other fossil fuels and toward a new energy future by tapping into our abundant supplies of clean renewable home grown energy sources and by deploying our technological know how to use energy more efficiently

**Fueling Our Future: An Introduction to Sustainable Energy** 2007-04-19 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 nonprofessionals seeking ideas and strategies on net zero options that are beautiful and renewably powered

*Electricity from Renewable Resources* 2010-03-05 today another profound transformation is underway a combination of forces is taking us from a carbon centric inefficient energy system to one that emphasizes efficiency and draws from diverse energy sources including the sun in 2012 more than half of total net additions to global electric generating capacity came from renewable sources since 2008 u s electricity generation from wind and solar power has more than doubled sharp and largely unforeseen growth in the u s shale gas market has altered the dynamics of the global energy landscape and helped spark a renaissance in u s manufacturing these changes together with improvements in energy efficiency and a changing transportation sector have contributed to a drop in u s carbon emissions which hit a 20 year low in 2012 at the same time the business of energy is changing from one focused on kilowatt hours to one focused on services the roles that distribution and transmission play could change dramatically as we move toward an energy system that is more diverse more dispersed and more carbon neutral energy is becoming a more essential component of strategies to safeguard and improve our security economy and environment as the u s energy department s only national laboratory focused on renewable energy and energy efficiency the national renewable energy laboratory nrel is uniquely positioned to help inform and guide energy system transformation nrel complements its scientific research with high quality credible technology neutral and objective analysis that spans the entire energy portfolio to inform policy and investment decisions as renewable energy and energy efficiency technologies move from concept to commercialization to market penetration for 35 years our work with the public and private sectors has catalyzed the emergence of a clean energy industry that is creating jobs and providing viable low carbon energy options at home and around the world

*Solar Hydrogen Generation* 2008-02-21 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

*The Road to a New Energy Future* 2006 energy in america is undergoing a period of rapid change driven by new technologies consumer empowerment and the imperative to reduce emissions that cause global warming but many utilities are dragging their feet or actively impeding progress people who want to save energy or install solar panels are finding their efforts at odds with utilities seeking to preserve their profits seeing an existential threat to their business model utilities across the country are pursuing policy changes that will make it less viable for customers to generate their own electricity impatient with the slow pace of change an increasing number of cities are taking matters into their own hands as their citizens seek energy that is local affordable and clean empowered describes how city officials and activists in boulder minneapolis and madison are fighting back against entrenched utilities and taking charge of their energy future
Renewing Our Energy Future 1995 a nobel laureate imagines the technolgies that will allow us to harness alternative fuel sources and power society despite the lack of carbon based fuels in an intriguing look at two centuries into the future

The New Net Zero 2014 an interdisciplinary approach brings together economic social environmental and policy issues to give you a holistic view of this multi faceted subject area chapters explore the full range of renewable energy technologies including solar thermal solar photovoltaics bioenergy in all its forms hydroelectricity tidal power wind energy wave energy and deep geothermal energy beautiful illustrations augment the text while tables boxed examples and online end of chapter exercises enrich your learning experience new to this edition a new chapter on thermodynamics provides a useful primer for understanding renewable heat energy technologies an updated chapter explores the status of challenges and opportunities for the integration of renewable energy technologies in rapidly evolving electric grid systems a new chapter on renewable energy futures looks ahead to potential developments in this ever advancing field and enhanced pedagogy that includes more comprehensive chapter summaries

Realizing a Clean Energy Future 2015-06-16 there is a growing sense of national urgency about the role of energy in long term u s economic vitality national security and climate change this urgency is the consequence of many factors including the rising global demand for energy the need for long term security of energy supplies especially oil growing global concerns about carbon dioxide emissions and many other factors affected to a great degree by government policies both here and abroad on march 13 2008 the national academies brought together many of the most knowledgeable and influential people working on energy issues today to discuss how we can meet the need for energy without irreparably damaging earth s environment or compromising u s economic and national security a complex problem that will require technological and social changes that have few parallels in human history the national academies summit on america s energy future summary of a meeting chronicles that 2 day summit and serves as a current and far reaching foundation for examining energy policy the summit is part of the ongoing project america s energy future technology opportunities risks and tradeoffs which will produce a series of reports providing authoritative estimates and analysis of the current and future supply of and demand for energy new and existing technologies to meet those demands their associated impacts and their projected costs the national academies summit on america s energy future summary of a meeting is an essential base for anyone with an interest in strategic tactical and policy issues federal and state policy makers will find this book invaluable as will industry leaders investors and others willing to convert concern into action to solve the energy problem

Building a Sustainable Energy Future 2011-01
Empowered: A Tale of Three Cities Taking Charge of their Energy Future 2015-11-11
Powering the Future 2011-09-27
Renewable Energy 2018
The National Academies Summit on America's Energy Future 2008-12-03