

Sustainable Rural Electrification Sustainable Development

This book presents new research on solar mini-grids and the ways they can be designed and implemented to provide equitable and affordable electricity access, while ensuring economic sustainability and replication. Drawing on a detailed analysis of solar mini-grid projects in Senegal, the book provides invaluable insights into energy provision and accessibility which are highly relevant to Sub-Saharan Africa, and the Global South more generally. Importantly, the book situates mini-grids in rural villages within the context of the broader dynamics of national- and international-level factors, including emerging system innovation and socio-technical transitions to green technologies. The book illustrates typical challenges and potential solutions for practitioners, policymakers, donors, investors and international agencies. It demonstrates the decisive roles of suitable policies and regulations for private-sector-led mini-grids and explains why these policies and regulations must be different from those that are designed as part of an established, centralized electricity regime. Written by both academics and technology practitioners, this book will be of great interest to those researching and working on energy policy, energy provision and access, solar power and renewable energy, and sustainable development more generally.

For those in developed nations, suddenly being without electricity is a disaster: power cuts have us fretting over the food stored in the freezer, and even a few hours without lights, televisions, or air conditioning is an ordeal. However, for an estimated 1.6 billion people worldwide, the absence of electricity is their daily experience. An untold number of others live with electricity that is erratic and of poor quality. How can electric power be brought into their lives when the centralized utility models that have evolved in developed nations are not an economically viable option? Poor, rural communities in developing nations cannot simply be 'plugged in' to a grid. Small-scale Distributed Generation (DG), ranging from individual solar home systems to village level grids run off diesel generators, could provide the answer, and this book compares around 20 DG enterprises and projects in Brazil, Cambodia and China, each of which is considered to be a "business model" for distributed rural electrification. While large, centralized power projects often rely on big subsidies, this study shows that privately run and localized solutions can be both self-sustaining and replicable. Its three sections provide a general introduction to the issue of electrification and rural development, set out the details of the case studies and compare the models involved, and discuss the important thematic issues of equity, access to capital and cost-recovery. Hisham Zerriffi shows that in each case, it is not simply a matter of matching a particular technology to a particular need. Numerous institutional factors come into play including the regulatory regime, access to financial services, and government/utility support or opposition to the DG alternative. Despite this, in many countries, the question is not whether DG has a role to play. Rather it is a question of how it will play a role.

"[T]o devise development planning without the participation of [rural] women is like using four fingers when you have ten." Both lack of access to energy and climate change threatens poverty reduction and sustainable development in Nigeria. Most poor communities in Africa use inadequate fuels and are highly vulnerable to the impacts of climate change, with women bearing most of the social, economic, and environmental costs. Promoting access to affordable and sustainable energy through policy interventions is one crucial path to achieving

sustainable development. Renewable energy offers countries the opportunity to meet the energy demands of the poorest and most vulnerable in each society, and thereby achieve many of the sustainable development goals, such as: hunger and poverty eradication, gender equity, affordable and clean energy, climate action, and maternal health. The Nigerian government is constantly formulating legal frameworks for renewable energy to expand the availability of energy (including electricity) to rural areas while reducing the impacts of climate change. Yet the extent to which these legal frameworks will be implemented successfully remain in doubt; as to date, Nigeria has been unable to achieve its stated goal of sustainable development. Why are renewable energy policies and laws in Nigeria not succeeding? This thesis asks whether one reason may be that Nigerian women living in rural areas have little role in both designing renewable energy laws and policies and participating in their effective implementation. This is a problem given that rural women are the primary users of unsustainable energy, they suffer most from its negative impacts, they are the main beneficiaries of rural electrification, and the closest to the needs and capacities of the population in rural communities. This thesis is mainly qualitative. Multiple approaches (feminist historical research, documentary or doctrinal analysis as well as analysis by specific illustrative examples) were used to explore the phenomenon of why the Nigerian government's concerted efforts at developing the legal frameworks for renewable energy have not yielded their desired goals of promoting sustainable development, and what lessons could be learned from South Africa. In addition to contributing to the gender and renewable energy literature, the research attempts to develop a blueprint for inclusive approaches to renewable energy law. It investigates how renewable energy legal and institutional frameworks could effectively include rural women. Using ideas from feminist legal theorists, the thesis makes a case for why rural women should be considered suitable stakeholder participants. It concludes that renewable energy policy- and law-making processes which consider the voices and active participation of rural women could encourage an increase in the generation, distribution, and use of renewable energy in the poorest inaccessible areas while closing the gap between renewable energy policies and laws, and sustainable development. Finally, it recommends that renewable energy policies and laws should increase rural women's participation by using among other things "recognition politics," which allows for the representation of subordinate social groups in bodies such as Parliaments; for example, by using measures such as mandatory affirmative action - quota system clauses, and techniques such as "Taking Parliament to the People."

Infrastructure, Sustainability and Unevenness

Renewables for Energy Access and Sustainable Development in East Africa

Powering Rural Development

A Case Study of Guizhou Province, China

Rural Electrification Through Decentralised Off-grid Systems in Developing Countries

Evaluating Climate Change Action for Sustainable Development

More than 1.3 billion people worldwide lack access to electricity. Although extension of the electricity grid remains the preferred mode of electrification, off-grid electrification can offer a solution to such cases. Rural Electrification through Decentralised Off-grid Systems in Developing Countries provides a review of rural electrification experiences with an emphasis on off-grid electrification and presents business-related aspects including participatory

arrangements, financing, and regulatory governance. Organized in three parts, *Rural Electrification through Decentralised Off-grid Systems in Developing Countries* provides comprehensive coverage and state-of-the-art reviews which appraise the reader of the latest trend in the thinking. The first part presents the background information on electricity access, discusses the developmental implications of lack of electricity infrastructure and provides a review of alternative off-grid technologies. The second part presents a review of experiences from various regions (South Asia, China, Africa, South East Asia and South America). Finally, the third part deals with business dimensions and covers participatory business models, funding challenges for electrification and regulatory and governance issues. Based on the research carried out under the EPSRC/ DfID funded research grant for off-grid electrification in South Asia, *Rural Electrification through Decentralised Off-grid Systems in Developing Countries* provides a multi-disciplinary perspective of the rural electrification challenge through off-grid systems. Providing a practical introduction for students, this is also a key reference for engineers and governing bodies working with off-grid electrification.

In 1934, Lewis Mumford critiqued the industrial energy system as a key source of authoritarian economic and political tendencies in modern life. Recent debate continues to engage issues of energy authoritarianism, focusing on the contest between energy-driven globalization (the spread of energy deregulation and the simultaneous consolidation of the oil, coal, and gas industries) and the so-called "sustainable energy" strategy that celebrates the local and community scale characteristics of renewable energy. Including theoretical inquiries and case studies by distinguished writers, *Transforming Power* is divided into three parts: *Energy, Environment, and Society*; *The Politics of Conventional Energy*; and *The Politics of Sustainable Energy*. It interrogates current contemporary energy assumptions, exploring the reflexive relationship between energy, environment, and society, and examining energy as a social project. Some of these have promised a prosperous future founded upon technological advances that further modernize the modern energy system, such as "inherently safe" nuclear power, environmentally friendly coal gasification, and the advent of a wealthier, cleaner world powered by fuel cells; and the "green technologies," said by advocates to prefigure a revival of human scale development, local self-determination, and a commitment to ecological balance. >br> This volume offers a timely engagement of the social issues surrounding energy conflicts and contradictions. It will be of interest to policymakers, energy and environmental experts, sociologists, and historians of technology. John Byrne is director of the Center for Energy and Environmental Policy (CEEP) and Distinguished Professor of Public Policy at the University of Delaware. Noah Toly is a research associate and Ph.D. candidate in the Center for Energy and Environmental Policy at the University of Delaware. Leigh Glover is policy fellow and assistant professor in the Center for Energy and Environmental Policy at the University of Delaware.

An understanding of the role of energy-related governance systems and the conditions required for a shift towards renewables in developing countries is urgently needed in order to tap into the global potential of low-carbon development. Although renewable energy sources have become technically feasible and economically viable, social and political factors continue to persist as the most critical obstacles for their dissemination. *How Power Shapes Energy Transitions in Southeast Asia* conceptualizes power for the field of sustainable energy governance. Based on empirical findings from the Philippines and Indonesia, the book develops an analytical approach that incorporates power theory into a multi-level governance framework. The book begins with a profound background on renewable energy development around the world and presents major trends in development cooperation. A power-based multi-level governance approach is

introduced that is rooted in development thinking. Examining how coordination and power relations shape the development and dissemination of renewable energy technologies, the book also shows how decentralization affects low carbon development in emerging economies. Sparking debate on the ways in which energy transitions can be triggered and sustained in developing countries, this book will be of great interest to students and scholars of renewable energy development and environmental politics and governance as well as practitioners in development cooperation.

The Mini-grid Experience from India

How Small Power Producers and Mini-Grids Can Deliver Electrification and Renewable Energy in Africa

Energy, Environment, and Society in Conflict

Rural Energy for Sustainable Development Technology and Environmental Issues

Building Innovation Capabilities for Sustainable Industrialisation

Proceedings of Village Power '98 ... Scaling Up Electricity Access for Sustainable Rural Development ... Volume i ... U.s. Department of Energy

After the United Nations adopted the 17 Sustainable Development Goals (SDGs) to "end poverty, protect the planet, and ensure prosperity for all," researchers and policy makers highlighted the importance of targeted investment in science, technology, and innovation (STI) to make tangible progress. Science, Technology, and Innovation for Sustainable Development Goals showcases the roles that STI solutions can play in meeting on-the-ground socio-economic and environmental challenges among domestic and international organizations concerned with the SDGs in three overlapping areas: agriculture, health, and environment/energy. Authors and researchers from 31 countries tackle both big-picture questions, such as scaling up the adoption and diffusion of new sustainable technologies, and specific, localized case studies, focusing on developing and middle-income countries and specific STI solutions and policies. Issues addressed include renewable energy, automated vehicles, vaccines, digital health, agricultural biotechnology, and precision agriculture. In bringing together diverse voices from both policy and academic spheres, this volume provides practical and relevant insights and advice to support policy makers and managers seeking to enhance the roles of STI in sustainable development.

This book showcases how small-scale renewable energy technologies such as solar panels, cookstoves, biogas digesters, microhydro units, and wind turbines are helping Asia respond to a daunting set of energy governance challenges. Using extensive original research this book offers a compendium of the most interesting renewable energy case studies over the last ten years from one of the most diverse regions in the world. Through an in-depth exploration of case studies in Bangladesh, China, India, Laos, Indonesia, Malaysia, Mongolia, Nepal, Papua New Guinea, and Sri Lanka, the authors highlight the applicability of different approaches and technologies and illuminates how household and commercial innovations occur (or fail to occur) within particular energy governance regimes. It also, uniquely, explores successful case studies alongside failures or "worst practice" examples that are often just as revealing as those that met

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their targets. Based on these successes and failures, the book presents twelve salient lessons for policymakers and practitioners wishing to expand energy access and raise standards of living in some of the world's poorest communities. It also develops an innovative framework consisting of 42 distinct factors that explain why some energy development interventions accomplish all of their goals while others languish to achieve any.

Decentralized Rural Electrification for Sustainable Development
Some Issues and Questions
Handbook of Research on Renewable Energy and Electric Resources for Sustainable Rural Development
IGI Global
Mini-Grids for Rural Electrification of Developing Countries
Practical Experiences, Lessons and Solutions from Senegal
Solar Energy, Mini-grids and Sustainable Electricity Access
Yearbook 2013 - Energy and Sustainable Development
Transforming Power

Analysis and Case Studies from South Asia

To maintain a healthy ecosystem for contemporary society and for future generations, policies must be implemented to protect the environment. This can be achieved by consistent evaluation of new initiatives and strategies. The Handbook of Research on Renewable Energy and Electric Resources for Sustainable Rural Development is a critical scholarly resource that examines efficient use of electric resources and renewable energy sources which have a positive impact on sustainable development. Featuring coverage on cogeneration thermal modules, photovoltaic (pv) solar, and renewable energy systems (RES) application practices, this publication is geared towards academics, practitioners, professionals, and upper-level students interested in the latest research on renewable energy and electric resources for sustainable rural development.

The development of four different sectors, electrical power, information, urban and rural areas and social welfare from 1988 to 2005.

This short open access book investigates the role of renewable energy in East Africa to provide policy-relevant inputs for the achievement of a cost-effective electrification process in the region. For each country, the authors review the current situation in the domestic power sector, adopt a GIS-based approach to plot renewable energy resources potential, and review currently planned projects and projects under development, as well as the key domestic renewables regulations. Based on such information, least-cost 100% electrification scenarios by 2030 are then modelled and comparative results over the required capacity additions and investment are reported and discussed. The authors also inquire into some of the key technological, economic, policy, cooperation, and financing challenges to the development of a portfolio of renewables to promote energy access in a sustainable way, including a discussion of the challenges and opportunities that might stem from the interaction between local RE potential and natural gas resources currently under development in the region. To conclude, policy recommendations based on the book's results and targeted at international cooperation and development institutions, local policymakers, and private stakeholders in the region are elaborated.

Some Issues and Questions

The Governance of Small-Scale Renewable Energy in Developing Asia

Geothermal Energy Resources for Developing Countries

Off-grid Renewable Energy Options for Rural Sustainable Development

Decentralized Rural Electrification for Sustainable Development

The book analyzes energy technologies, business models and policies to

promote sustainable development. It proposes a set of recommendations for further activities and networking on access to energy and renewable energies and promotes an integrated approach to sustainable resource management. The book discusses access to energy, as a precondition for socio-economic progress. It depicts the global dimension of the challenge in terms of access to electricity and other forms of energy in developing countries. The three main interlinked topics related to energy and sustainable growth are separately discussed: appropriate technologies for modern energy services, business models for the development of new energy markets, and policies to support new energy systems. The description of activities and programmes of some public and private Italian stakeholders is also included.

Approximately 1.5 million Mexicans lack access to electricity, and most of them live in rural and remote areas with high levels of marginalization and poverty. Access to secure, affordable and modern energy is central to poverty reduction as it is a critical enabler of development (IEA, 2017). However, in most cases, rural electrification implementation has not yielded the expected outcomes. This thesis explores under what conditions can electricity help to alleviate poverty and achieve sustainable development in rural areas. I examine these concerns as also central to addressing the root causes of unevenness and marginalization in these areas. Through fieldwork with off-grid providers and semistructured interviews of beneficiaries in the rural localities of Oaxaca and Chiapas in Southern Mexico, as well as with government officials, I explore how off-grid electrification improves wellness. By examining the implementation of two rural electrification programs, I reflect on what can be done to strengthen these efforts. In particular, I highlight the essential role that context plays when designing and implementing programs aimed at alleviating poverty. In conclusion, I propose combining systems-level coordination with place-based policies to better address vulnerabilities for the sustainability of rural off-grid programs and coordination challenges revealed in the projects I studied. Deals indepth with the biomass production and requirement in South Asia, with special reference to India.

Sustainable Access to Energy in the Global South

Energy Access, Poverty, and Development

The Benefits of Sustainable Energy Access in Latin America and the Caribbean

Proceedings of the African High-level Regional Meeting on Energy and Sustainable Development

A Case Study of the Ipari-Efugo Project

Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kingdom of

Bhutan for the Sustainable Rural Electrification Project

Rural Electrification poses solutions to the insuperable modern challenge of providing 24/7 electricity for populations, housing and territory located outside towns and cities. The book reviews the historical development of rural energy systems, their status quo, and the role of renewable and fossil fueled solutions in delivering electricity. It addresses core issues of energy source typologies, resource deployment, fundamental challenges and limitations, the burgeoning threat of climate change, and the role of the renewable energy transition. Chapters account for almost all forms of fuel solutions, with a focus on electrification economics, planning, and policy using the most cost-effective fuels and systems available. Novel approaches to address the challenges of rural electrification, including distributed generation systems, new management and ownership models, off-grid systems, and future energy technologies are thoroughly explored. The work concludes with a comparative assessment of different energy supply technologies and scenarios, contrasting the pros and cons of fossil fuels versus renewable energy resources to achieve the goal of comprehensive rural electrification. Provides a suite of new approaches to deliver and expand electrification across challenging rural environments Describes optimal economics, planning and policy for electrification where there is no access to electricity Reviews how practitioners can achieve cost reductions for rural energy supply using existing technologies Addresses routes to power rural electrification within a transitioning energy economy while simultaneously accounting for climate change considerations

This report describes the four basic types of on- and off-grid small power producers emerging in Africa and highlights the regulatory and policy questions that must be answered by electricity regulators, rural energy agencies, and ministries to promote commercially sustainable investments by private operators and community organizations.

Energy access is an essential prerequisite for economic, social, and human development. The 2015 United Nations Sustainable Development Goals (SDGs) explicitly recognized affordable and clean energy as a key factor in development, alongside education and poverty alleviation. The UN Sustainable Energy for All initiative (SEforALL) mobilizes international donors, countries, and the private sector to help people in developing countries gain access to modern energy services. To assist in support of SEforALL goals, this joint study of the Inter-American Development Bank (IDB) and the United Nations Development Programme (UNDP) provides a comprehensive review of energy poverty policies and programs in Latin America and the Caribbean (LAC). This report measures the progress and impact of energy-access programs and also documents the experience of successful projects. This study reviews cutting-edge methodologies to assist in program design, shares of experiences of successful programs and develops a vision for reaching sustainable energy for all in the LAC region. With electricity coverage at more than 96 percent, LAC is close to becoming the world's first developing region to achieve universal access to electricity. Despite recent progress, within LAC there are still substantial pockets of energy poverty. Approximately 21.8 million people are without electricity access. More than 80 million people rely on firewood and charcoal for cooking that is burned in fuel-inefficient, primitive stoves. These traditional cooking technologies emit a significant amount of indoor air pollution (IAP), which has been linked to respiratory illnesses and adverse environmental impacts. Thus, in addition to

promoting electricity, energy access programs also might give priority to the promotion of cleaner methods cooking by making available better stoves and cleaner burning fuels at reasonable costs. The report also explores ways to measure energy poverty and monitor energy access in developing countries. The accuracy and effectiveness of tools such as the IEA's household energy data efforts and the Global Tracking Framework depend on collecting information through standardized national surveys. Approaches to measure energy poverty and monitor energy access have increasingly focused on the provision of energy services such as lighting, space conditioning and cooking. The transition from low-quality energy services to more modern forms can be accomplished in different ways. As households in developing countries adopt electricity and clean methods of cooking, they benefit from higher quality, lower cost and convenient to use appliances. However, measuring the societal and developmental benefits of energy investments--though difficult--is important. Two basic approaches have evolved over the years to measure the benefits of energy access: (i) consumer surplus and (ii) regression-based techniques. The consumer surplus approach evaluates the economic benefits of energy services through measuring increased demand resulting from lower costs of such energy end uses such as lighting, radio and television. When possible, rigorous impact evaluation techniques based on multivariate models can be used to more directly measure the socioeconomic benefits associated with energy access and modern energy services including higher income and improved education. In recent years, new approaches for meeting the requirements of modern and sustainable energy services have emerged. Due to technical and market changes, new types of equipment have become available for providing energy services to rural areas. In LAC, three basic models have been developed to provide rural populations with electricity service: (i) main grid extension, (ii) community networks, and (iii) individual home-based systems (including clean cookstoves).

For the Ninth Session of the Commission on Sustainable Development

Field Survey and Sino-Japan Comparative Analysis

Sustainable Development in Rural China

Renewables for Sustainable Village Power

Economic Evaluation of Sustainable Development

Rural Electrification

Presenting the best papers of the 3rd EPFL-UNESCO Chair Conference on Technologies for Development, this publication offers a valuable collection of innovative case studies exploring access to energy and renewable energy technologies in the Global South. It investigates the key determinants for successfully providing energy to resource-poor communities and examines a wide range of technologies for energy production, distribution, storage and efficient use. Taken together, these case studies deal with the entire life cycle of products and solutions, as well as the complete value chain including all relevant stake holders. The collection also draws upon empirical research conducted in Africa and South America to present critical perspectives on women's access to technologies in the renewable sector. This publication serves as a bridge between engineers, economists and other scientists involved in research on the interface between technology and human, social and economic development. It also provides a valuable resource to academics and researchers of the natural sciences, computer science, information management, quantitative social sciences and business studies.

This book is open access under a CC BY 4.0 license. This book presents methods to evaluate sustainable development using economic tools. The focus on sustainable development takes the reader beyond economic growth to encompass inclusion, environmental stewardship and good governance. Sustainable Development Goals (SDGs) provide a framework for outcomes. In illustrating the SDGs, the book employs three evaluation approaches: impact evaluation, cost-benefit analysis and objectives-based evaluation. The innovation lies in connecting evaluation tools with economics. Inclusion, environmental care and good governance, thought of as "wicked problems", are given centre stage. The book uses case studies to show the application of evaluation tools. It offers guidance to evaluation practitioners, students of development and policymakers. The basic message is that evaluation comes to life when its links with socio-economic, environmental, and governance policies are capitalized on. The problem of this study was propelled by the need to empirically assess Ghana's energy needs, and hence ways of meeting its net demand to support industrialization, or commerce that will foster growth. The production of Crude Palm Oil (CPO), will serve as a double edge sword to bring about economic development on one hand and also produce renewable energy to power a rural community. The prospects of the waste from CPO as the alternative energy source that can power rural development in a sustainable manner were researched. Research questions that sought to examine Ghana's present energy source vis-a-vis rural electrification as well as a sustainable alternative energy source available for rural energy demand that will supplement the existing national grid, using Kokofu, and NGL as a case study was analysed. It is a fact that, the energy demand of Ghana is not met, as supply of electricity falls short of the increasing demand and that the distribution system does not reach all corners of Ghana. The research concluded that a renewable energy source generated from the processes of CPO will be of prime importance to the nation as a whole with its minimal impact on the environment."

Renewable Rural Electrification for Sustainable Development in Kenya and Uganda
Sustainable Development in the Sectors of Electric Power, Information, Urban and Rural Areas, and Social Welfare

Renewable Energy for Unleashing Sustainable Development

Renewable Electrification in Developing Economies

From the Bottom Up

Rural Electrification and Sustainable Development in the Bolivar Province, Ecuador

Rural electrification can have many benefits-not only bringing lighting, but improving the quality of health care, spreading information and supporting productive enterprises.

The extent of these benefits has been questioned, arguing that they may be insufficient to justify the investment costs. This book quantifies these benefits. It finds that the benefits can indeed be high, substantially outweighing the costs, and that consumer willingness to pay is generally sufficient to achieve financial sustainability. However, benefits could be increased further by providing smart subsidies to assist connections for poorer households,

promote productive uses and further consumer education. This book is open access under a Creative Commons license. This authoritative book presents the ever progressing state of the art in evaluating climate change strategies and action. It builds upon a selection of relevant and practical papers and presentations given at the 2nd International Conference on Evaluating Climate Change and Development held in Washington DC in 2014 and includes perspectives from independent evaluations of the major international organisations supporting climate action in developing countries, such as the Global Environment Facility. The first section of the book sets the stage and provides an overview of independent evaluations, carried out by multilateral development banks and development organisations. Important topics include how policies and organisations aim to achieve impact and how this is measured, whether climate change is mainstreamed into other development programs, and whether operations are meeting the urgency of climate change challenges. The following sections focus on evaluation of climate change projects and policies as they link to development, from the perspective of international organisations, NGO's, multilateral and bilateral aid agencies, and academia. The authors share methodologies or approaches used to better understand problems and assess interventions, strategies and policies. They also share challenges encountered, what was done to solve these and lessons learned from evaluations. Collectively, the authors illustrate the importance of evaluation in providing evidence to guide policy change to informed decision-making.

The book provides a study of sustainable development in rural China. Because of its huge population and vast land area, this is an important issue not only for China but for the whole world. The research presented is both multi aspect and systematical. It can be likened to a tree where the trunk is the three main aspects: economy, environment and rural society, and the five main branches are agricultural development, industrial pollution, energy security, labor migration and social welfare, and these are the book's five main topics. The research methods of field survey and Sino-Japanese comparison will be of particular interest to readers. The field survey enables readers to become familiar with the environment of rural China. Survey reports and data

provide readers with a more profound and vivid understanding of rural China and comparative methods benefit readers from different countries and a variety of cultural backgrounds. For Japanese readers or readers who understand Japanese well, they make China more easily understandable, while Chinese readers gain insights into the country's future and the direction of current developments based on a Japanese frame of reference. For readers outside China and Japan, this book serves as an introduction to Chinese society and also to Japan. Finally, the author provides various paradigmatic scenarios, including default and sustainable. After reading this book, readers will be aware that the earlier and the more we pay attention to these issues, the easier it will be for rural China to achieve a sustainable situation.

Promoting Sustainable Development in Nigeria Through Rural Women's Participation in Decision-Making About Renewable Energy Law and Policy

Meeting Challenges, Measuring Progress

Renewable Energy-based Rural Electrification

Exploring Marginalization in Mexico

How Power Shapes Energy Transitions in Southeast Asia

Handbook of Research on Renewable Energy and Electric

Resources for Sustainable Rural Development

In recognition of the fact that billions of people in the developing world do not have access to clean energies, the United Nations launched the Sustainable Energy for All Initiative to achieve universal energy access by 2030. Although electricity grid extension remains the most prevalent way of providing access, it is now recognized that the central grid is unlikely to reach many remote areas in the near future. At the same time, individual solutions like solar home systems tend to provide very limited services to consumers. Mini-grids offer an alternative by combining the benefits of a grid-based solution with the potential for harnessing renewable energies at the local level. The purpose of this book is to provide in-depth coverage of the use of mini-grids for rural electrification in developing countries, taking into account the technical, economic, environmental and governance dimensions and presenting case studies from South Asia. This book reports on research carried out by a consortium of British and Indian researchers on off-grid electrification in South Asia. It provides state-of-the art technical knowledge on mini-grids and micro-grids including renewable energy integration (or green mini-grids), smart systems for integration with the central grid, and standardization of systems. It also presents essential analytical frameworks and approaches that can be used to analyze the mini-grids comprehensively including their techno-economic aspects, financial viability and regulatory issues. The case studies drawn from South Asia demonstrate the application of the framework and showcase various successful efforts to promote mini-grids in the region. It also reports on the design and implementation of a demonstration project carried out

by the team in a cluster of villages in Odisha (India). The book's multi-disciplinary approach facilitates understanding of the relevant practical dimensions of mini-grid systems, such as demand creation (through interventions in livelihood generation and value chain development), financing, regulation, and smart system design. Its state-of-the-art knowledge, integrated methodological framework, simulation exercises and real-life case analysis will allow the reader to analyze and appreciate the mini-grid-related activities in their entirety. The book will be of interest to researchers, graduate students, practitioners and policy makers working in the area of rural electrification in developing countries.

Access to reliable electricity and clean cooking facilities is crucial to human well-being and to a country's economic development (IEA, 2016). These two forms of modern energy services are essential for providing basic human needs such as clean water, sanitation and healthcare, and for reducing poverty (IEA, 2016). Over the past two decades, China has provided hundreds of millions of rural people with access to these two forms of modern energy services. Despite the accomplishments, still many people in China have no access to electricity, and more than 1/3 of China's population relies on biomass for cooking (NEA, 2016; IEA, 2016). Finding appropriate ways to provide modern energy services to these populations has been a key issue for Chinese government. To serve this aim, this dissertation examines off-grid renewable energy options for rural electrification and clean cooking services in rural China.

This text aims to be a driving force for an economically sound and sustainable development of developing countries. It looks at the provision of geothermal energy within the framework of sustainable energy development for power generation, rural electrification and so forth.

Strategies for Distributed Generation

Sustainable Energy for Sustainable Development

An Assessment of the Effect of Participation on Sustainable Development in a Rural Electrification Project

Essential Technologies and Implementation Approaches

Renewable Energy for Sustainable Rural Village Power

The Welfare Impact of Rural Electrification

This book argues that renewable electrification in developing countries provides important opportunities for local economic development, but new pathways are required for turning these opportunities into successful reality. Building Innovation Capabilities for Sustainable Industrialisation offers a novel input into the debate on development of capabilities for sustainable industrialisation and delivers key insights for both researchers and policy makers when it comes to the question of how to increase the economic co-benefits of renewables expansion. The chapters in the book use a tailored analytical framework in their studies of renewable electrification efforts in Kenya and other countries in sub-Saharan Africa. They draw on a mix of project, sector and country level case studies to address questions such as: What capabilities are developed through on-going renewable electrification projects in developing economies? How can the expansion of renewable electrification be supported in a way that also encourages sustainable economic development? What role do international linkages (South-South and North-South) play and what role should they play in the greening of energy systems in developing economies? The authors provide a new understanding of how green transformation and sustainable industrialisation can be combined, highlighting the opportunities and constraints for local capability building and the scope for local policy action. This book will be of great interest to students and scholars of development studies,

energy studies, sustainability and sustainable development, as well as practitioners and policy makers working in development organisations and national governments.

NREL has developed the RSVP team to address the enormous opportunity of bringing electricity to rural villages with economic and environmentally sustainable renewables solutions. While the program is only several years old, it is well positioned to help develop, communicate, and implement RE-based rural applications. A critical aspect of this effort is the partnerships with industry, in-country organizations, international development institutions, government agencies, national labs, and universities. The electrification of the rural world is an overwhelming challenge, but with international cooperation and ingenuity we intend to "make a go of it."

A Reassessment of the Costs and Benefits ; an IEG Impact Evaluation

Optimizing Economics, Planning and Policy in an Era of Climate Change and Energy Transition

Science, Technology, and Innovation for Sustainable Development Goals

A complex governance challenge

Insights from Agriculture, Health, Environment, and Energy

A Regional View Towards Sustainable Renewable Energy Development in the Pacific