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Introduction and user manual

Advance copy

SUSTAINABLE ENERGY REGULATION AND POLICYMAKING FOR AFRICA

CONTENTS

1. ACKNOWLEDGEMENTS

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2. INTRODUCTION

Energy is a prerequisite for industrial development and activity; without an effective energy supply neither are possible. While there is at present little real constriction on the overall supply of energy to industry, there are a number of serious issues when considering industrial energy use and the sustainable growth of industries particularly in developing countries. Such issues range from the additional cost of energy processes due to inefficient utilization, vulnerability to price shocks of imported fuels and the externalities associated with wide-scale inefficient and unclean utilization of energy, both at the local/national level and the regional/global level.

Meanwhile, at the household level, over 1.6 billion people lack access to modern forms of energy services. The vast majority of these people live in the rural areas of the poorest regions of the world. Many are either too poor, or too isolated to attract commercial energy-related investments since they do not constitute a viable market that can generate an adequate return on those investments.

This situation is of concern as energy is an essential building block for fighting poverty and promoting sustainable development. Therefore there is a definite need to establish close linkages between reliable energy services and income generation activities in rural areas. While the Millennium Development Goals do not specifically contain an energy component, the provision of safe and affordable energy is an important, if not vital, condition for their achievement.

While the adoption of renewable energy and energy efficiency technologies is at an advanced stage in some developed countries, developing countries are still far behind due to various barriers that include limited awareness amongst policy-makers, lack of capacity in terms of trained personnel, poor regulatory and policy frameworks and of course, the lack of finance.

Within many developing countries, there exists a lack of capacity and knowledge on how to foster a regulatory and policy environment that will better aid the adoption of more economically (in the long term) and environmentally sustainable methods of energy utilization, both in the industrial sector and the rural energy environment. Well-designed and effective policies as well as regulatory frameworks can have a significant positive impact on the uptake of new more energy efficient industrial processes and the development of the rural/renewable energy technology sector.

The Renewable Energy and Energy Efficiency Programme (REEEP) and the United Nations Industrial Development Organization (UNIDO) are organizations developing capacity-building programmes that aim at addressing the barriers to development of renewable energy and energy efficiency within developing countries.

The “Sustainable Energy Regulation and Policymaking for Africa” training package has been developed by the United Nations Industrial Development Organization (UNIDO) and is co-funded by the Renewable Energy and Energy Efficiency Programme (REEEP).

2.1. About UNIDO

The United Nations Industrial Development Organization (UNIDO) was set up in 1966 and became a specialized agency of the United Nations in 1985. UNIDO has responsibility for promoting sustainable industrialization throughout the developing world, in cooperation with its 171 Member States. Its headquarters are in Vienna, and it is represented in 35 developing countries through its field offices. UNIDO helps developing countries and countries with economies in transition in their fight against marginalization in today's globalizing world.

UNIDO focuses its technical cooperation activities on three main thematic priorities, which directly respond to international development priorities in line with the Millennium Development Goals (MDGs):

Poverty reduction through productive activities

Distinctively different from other agencies and institutions, UNIDO addresses poverty reduction (MDG1) by focusing on enabling the poor to earn a living, rather than providing help to deal with the symptoms of poverty. As such, UNIDO focuses on micro, small and medium scale enterprise development; rural and agro-industrial development (as well as “rural energy for productive use”); and women in development.

Trade capacity-building

Open borders and markets are essential; still, additional measures are required to increase the participation of developing countries. UNIDO thus combines building up the technical infrastructure required to participate in international trade (i.e. standards, quality, metrology, accreditation and certification) while strengthening key export sectors that require support services in strengthening/upgrading productive and export capacities.

Energy and environment

While energy is a prerequisite for poverty reduction (MDG1), environmental sustainability, as stipulated in MDG7 (Ensuring Environmental Sustainability) is one of today’s greatest challenges. UNIDO therefore assists countries in the implementation of activities related to the multilateral environmental agreements; the

promotion of energy efficiency; and the promotion of sustainable energy production and consumption practices.

Industry and energy has been a central theme of UNIDO's work for over 25 years. The Organization's technical cooperation programmes address both the supply and demand side in developing countries through provision of energy for industry and by improving industrial energy end-use efficiency. UNIDO also promotes the adoption of renewable energy technologies within the rural regions of developing countries as well as promoting renewable energy technologies for industrial applications. Between 1987 and today, UNIDO has implemented a wide range of projects in developing countries, at the policy, institutional and enterprise levels.

Further information on UNIDO can be accessed at www.unido.org

2.2. About REEEP

The Renewable Energy and Energy Efficiency Partnership (REEEP) is a global public-private partnership and was launched by the United Kingdom along with other partners at the Johannesburg World Summit on Sustainable Development in August 2002. It has been developed via an intensive consultation process in 2003 covering a wide range of stakeholders at the national and regional levels. In June 2004, the REEEP was formally established as a legal entity in Austria with the status of an international NGO.

REEEP actively structures policy initiatives for clean energy markets and facilitates financing mechanisms for sustainable energy projects. By providing opportunities for concerted collaboration among its partners, REEEP aims to accelerate the marketplace for renewable energy and energy efficiency. REEEP's goals are: to reduce greenhouse gas emissions, deliver social improvements to developing countries and countries in transition; by improving the access to reliable clean energy services, by making renewable energy technologies more affordable; and to bring economic benefits to nations that use energy in a more efficient way and increase the share of indigenous renewable resources within their energy mix.

The partnership is funded by a number of governments including: Australia, Austria, Canada, Ireland, Italy, Spain, The Netherlands, The United Kingdom, The United States and the European Commission. REEEP's regional secretariats provide access to best practice in policy and finance to promote renewable energy and energy efficiency. REEEP's International Secretariat engages political, financial and business support to reduce the risk inherent in implementing new policy and financing initiatives.

Further information on REEEP can be accessed at www.reeep.org

3. DEVELOPMENT OF THE TRAINING PACKAGE

In 2004, REEEP commissioned the development of an initial training package entitled "Regulation and Sustainable Energy". This was produced by the Centre for Management under Regulation (CMUR) at Warwick University, U.K., and provides an introduction to key issues in energy market and monopoly regulation as they affect sustainable energy, mainly electricity supply and consumption. This training package focused on the situation in developed countries, with case studies from Europe, the U.S. and Australia and was completed in April 2005. An outline of this training package is available from the REEEP website at www.reeep.org/groups/sern

REEEP then requested UNIDO to adapt and expand the training package to a developing country context, in the light of present experiences in, as well as constraints of, energy policy and regulation in developing countries.

In November 2005, UNIDO commissioned IT Power, AFREPREN, ESD and a host of national African experts to assist UNIDO to adapt and expand the existing training package, develop new material and publish a new training package on Sustainable Energy Regulation and Policymaking for Africa. The new training package focuses on regulation, policy and sustainable energy for African countries and includes case studies, and examples from a number of countries across sub-Saharan Africa.

3.1. Training Package Aims

This training package aims at reversing the existing lack of capacity and knowledge on how to foster regulatory and policy environments that will better aid the adoption of more economically (in the long term) and environmentally sustainable methods of energy supply and utilization, both in the industrial, commercial and urban domestic sectors and the rural energy environment in the developing countries.

The training package has three main focuses:

- Energy regulation and power sector reform.
- Increased renewable energy technology penetration for rural electrification.
- Sustainable use of energy through energy efficiency in industrial, commercial and domestic sectors (including energy efficiency within buildings).

The aim of the training package is to achieve a positive input in these three areas by increasing the awareness and knowledge of energy regulatory and policymaking bodies and their personnel, and thereby strengthen energy sector regulating and policymaking capacity within African governments.

The training package will:

- Provide a better understanding and awareness of the benefits of renewable energy and energy efficient technologies and an improved knowledge of proven policy and regulating models, mechanisms and practices available to support the development and deployment of sustainable energy technologies, through case studies from Europe, Africa and worldwide.
- Show how the pursuing of the key objective of sustainable energy development through renewable energy and energy efficient technologies can be promoted and supported by national energy regulations, policies and standards.

The training package has been designed to be used as a modular training resource in order to allow the user to select individual module topics without being forced to read all the proceeding modules. Therefore, a certain amount of repetition exists in the material presented between some of the different modules.

The information presented in each of the modules varies in terms of technical detail with some aspects being significantly technical in nature. Although the training manual is primarily directed towards energy sector policymaking and regulatory institutions, it is a prerequisite for these institutions to have an appreciation of the technical implications, mechanisms, tools and measures that will form the basis of appropriate and sustainable policies and regulations.

Further to this, policymakers and regulators should have an understanding of how the industrial, commercial and residential sectors will operate within, and conform to, any new or additional policies that aim to promote sustainable energy options. For this to be possible, these institutions need to have an intimate understanding of the different aspects of the energy sector and how they function. The training package, through its use of differing industrial, policy and regulatory perspectives as well as technical information, aims to provide this necessary level and diversity of information.

3.2 Suggested target audience

This training package is relevant to the needs of developing country governments, policymaking bodies and regulating institutions responsible for the development and functioning of the national energy sector and their staff. The training pack-

age should be particularly useful for staff in regulatory agencies and government departments who are new to regulation or to the ways that regulation can affect sustainable energy.

The main beneficiaries of the training package will be the policymakers and regulators of the energy sector in African countries, however many of the modules contain generic information on sustainable energy which can be useful to energy policy-makers and regulators in all developing countries.

Although policymakers and regulators are the principal target audience for the training package, it will also be useful to others who need to understand sustainable energy regulation, particularly energy companies. It therefore has the potential to benefit a wide variety of governmental and non-governmental organizations in the energy sector, including private companies, utilities, universities, research institutes, developmental agencies, NGOs and others, which are involved in policymaking, policy analysis, regulation and standard development.

As interested parties take up this "Sustainable Energy Regulation and Policymaking for Africa" training package, it can be developed further or used for a variety of training purposes at regional and national level in Africa and other developing countries.

4. STRUCTURE OF THE TRAINING PACKAGE

The training package provides an introduction to the key issues relating to the energy market and energy regulation, as they affect sustainable energy (energy efficiency, cogeneration and renewable energy). The training package focuses mainly on the policies and regulation relating to the generation, transmission, distribution and consumption of electricity and the opportunities and barriers in developing renewable energy and energy efficiency in these sectors. It is stressed that the training package is intended as an introduction to the subject and each module contains references to sources of more in-depth information.

There is no "perfect" generic way of designing or implementing regulation or policies for sustainable energy development. Each energy national sector differs — for example, in patterns of ownership, the degree of integration of energy companies, the level of competition and the maturity of a particular energy system. This training package does not set out to prescribe or recommend models of regulation or policies, which should necessarily be copied, but instead aims to provide examples of where regulation and/or policies have proved effective (or harmful) for the development of sustainable energy technologies.

The modules of the training package are therefore designed to:

- Provide an introduction to energy regulation, focusing on the electricity market, and how it relates to power sector reform;
- Provide an introduction to renewable energy and energy efficiency technologies and programmes;
- Outline issues affecting the implementation of sustainable energy technologies;
- Highlight useful examples of "good practice" and explain why they are effective;
- Provide an indication of more detailed studies elsewhere;
- Provoke discussion amongst participants.

The training package consists of this user manual and four separate "sub-packages". These sub-packages cover:

- Introduction to renewable energy and energy efficiency and the energy sector in Africa;

- Energy regulation (mainly covering electricity);
- Renewable energy;
- Energy efficiency.

In addition to the above sub-packages, an additional final module (module 20) examines the issues, barriers, challenges and opportunities surrounding the financing of renewable energy and energy efficiency projects and programmes. The first sub-package provides an overview on renewable energy and energy efficiency and the energy sector in Africa. The second sub-package on energy regulation is an opening section introducing the basic concepts of energy regulation; the third and fourth sub-packages on renewable energy and energy efficiency respectively cover the fundamentals of today's commercial renewable energy and energy efficiency options. The four sub-packages together give good theoretical grounding in sustainable energy policy and regulation as well as a critical analysis of practical and proven examples of sustainable energy policy and regulations in developing countries through a number of case studies focusing on Africa.

The training package is designed to be used as a set of presentations and written material for a course that can be run over a few days or as a longer, more in-depth course over weeks or months (see the following section on "How to use the training package"). Each module contains a "core" text that covers the main topic of the module. Each module also has attached to it case studies (where appropriate); a PowerPoint presentation; examples of thematic discussions; references to further written materials and websites and a glossary. Case studies are drawn from all over the world and from both developed and developing countries.

4.1. Course contents

The training package breaks down into the following sub-packages and modules, the contents of which are shown below:

User manual

- A few words on UNIDO and REEEP
- Development of the training package
- Training package aims
- Suggested target audience

Structure of the training package

- Course contents

How to use the training package

- Intensive course (example course schedule/structure - days)
- Long duration course (weeks)
- Self-learning

I. Introduction sub-package

Module 1: Overview of renewable energy and energy efficiency

- Status of renewable energy and energy efficiency in Africa
- Why should Africa promote renewables?
- Why should Africa promote energy efficiency?

Module 2: The energy sector in Africa

- Power sector
- Renewable energy
- Energy efficiency

II. Energy regulation sub-package

Module 3: Introduction to energy regulation

- Why regulate?
- What can be regulated: electricity system structures
- Who regulates?
- Types of regulation
- Regulation issues for sustainable generation

Module 4: The reform of the power sector in Africa

- Reforms in the African energy sector
- Possible reform options – experiences in Africa
  - Corporatization
  - Management contract
  - Unbundling (vertical and horizontal)
  - Independent power producers
  - Electricity law amendment

Module 5: Regulation types and options

- Types of regulation
  - Command and control
  - Self regulation
  - Incentive-based regulation
  - Market controls
- Examples of regulation in Africa

Module 6: Structure, composition and role of an energy regulator

- Principles of regulation
- Different models and options
- Role of a regulator
- Setting up a regulator
- Building a credible regulatory arrangement

Module 7: Formulating regulatory scenarios and national self-assessment

- Rationale for reforms in the electricity sector
- Implementing a regulatory framework for sustainable energy
- Renewable energy in rural areas
- A regulatory framework for energy efficiency
- Setting up a tangible regulatory framework
- Regulatory self-evaluation exercise

III. Renewable energy sub-package

Module 8: Renewable energy technologies

- Overview of renewable energy technologies
- Overview of costs of different technologies
- Overview of common barriers and issues limiting widespread use/dissemination of renewable energy

Module 9: Impact of different power sector reform options on renewables

- Impact of Corporatization on renewable energy
- Impact of management contract on renewable energy
- Impact of unbundling on renewable energy
- Impact of independent power producers on renewable energy
- Impact of electricity law amendment on renewable energy

Module 10: Regulatory and policy options to encourage development of renewable energy

- Design issues for regulatory/support mechanisms
- Types of regulatory and policy support mechanisms
- Examples of regulatory and policy support mechanisms in Africa and other developing countries
- Methodology and examples on how to calculate the level of feed-in tariffs

Module 11: Increasing energy access in rural areas

- Approaching energy services for rural areas of developing countries
- The Millennium Development Goals
- Linkage of energy to the MDGs
- Policy options for increasing access to energy services in rural areas
- Different models for increasing energy services in rural areas
- Experiences with increasing energy services in rural areas
- Planning for rural electrification

Module 12: Distributed generation: options and approaches

- Electricity supply scenarios
- Options for mini-grid systems
- Planning the approach
- Institutional issues
- Frameworks

IV. Energy efficiency sub-package

Module 13: Energy efficiency technologies and benefits

- The benefits of increased energy efficiency
- Where does energy efficiency fit into the overall energy mix?
- Target sectors
- Overview of energy efficiency actions
- Common barriers to implementation of energy efficiency measures
- Combining renewables and energy efficiency together to improve sustainability of energy development

Module 14: Supply-side management

- Supply-side management options and opportunities
  - Resource and resource preparation
  - Power generation and energy conversion
  - Transmission
  - Distribution
  - Transport of fossil fuels
- Constraints and challenges of supply-side management

Module 15: Demand-side management

- Why promote demand-side management
- What drives demand-side management
- Types of demand-side management measures

  - Industrial and commercial DSM practices
  - Energy auditing
- Information dissemination of DSM
- Challenges of implementing DSM programmes

Module 16: Impact of different power sector reform options on energy efficiency

- Impact of corporatization on energy efficiency
- Impact of contract management on energy efficiency
- Impact of unbundling on energy efficiency
- Impact of independent power producers on energy efficiency
- Impact of electricity law amendment on energy efficiency

Module 17: Regulatory and policy options to encourage energy efficiency

- Institutional considerations
- Policy options for increasing energy efficiency in targeted sectors
- Regulatory options: demand-side management
- Regulatory options: supply-side management

Module 18: Industrial energy efficiency and systems optimization

- Why industrial energy efficiency
- Promoting industrial energy efficiency
  - Linkage to ISO
  - Energy management standards
- Industrial systems optimization
  - Opportunities overview
  - Building technical capacity
- Getting started
  - Building a market for industrial energy efficiency services
  - Programme design
  - Developing enabling partnerships
  - Financing considerations
- Pulling it together
  - Industrial standards frameworks

Module 19: energy efficiency in buildings

- What is the energy efficiency of a building?
- Why is energy efficiency in buildings important?
- Energy efficiency in buildings methodology
  - Typical energy flow in buildings

  - Determining a buildings energy performance
  - Benchmarks
  - Certifying energy efficiency
- Energy efficiency measures for buildings
- Financing energy efficiency in buildings
- Developing and implementing policy on energy efficiency in buildings

V. Financing

Module 20: Financing options for renewable energy and energy efficiency

- The financiers' perspective
- Basic types of financing
- Types of financing models
  - Government-led models
  - Market-based models
- Existing policies and regulations
  - Fiscal measures
  - Subsidies
  - Market-based instruments
- Energy audits and feasibility studies
- Institutional finance
- Design aspects for measures to attract private investment
- List of potential donors and funds
- Examples

4.2 Case studies

Each of the above modules has included in it a number of relevant case studies. The list of case studies is given here in full by package, module and by country. It is hoped that new case studies will be added to each module in the future, as more experience is gained.

Module #	Case study #	Country	Case study title
2	1	Mauritius	Cogeneration in Mauritius

Energy Regulation

Module #	Case study #	Country	Case study title
4	1	Zimbabwe	Power sector reform in Zimbabwe
5	1	Zambia	Zambia energy regulation board

Renewable Energy

Module #	Case study #	Country	Case study title
8	1	Denmark	Wind power in local government: Denmark's renewable energy island
	2	UK	Solar water heating in local government in the UK
9	1	Kenya	Geothermal development in Kenya
10	1	Denmark	Denmark: support mechanisms for wind energy
	2	Germany	German feed-in mechanisms
	3	Spain	Spain: support mechanisms for wind energy
	4	Ghana	Renewable energy in Ghana
	5	Zambia	Zambia: institutional framework and status of renewable energy
	6	UK	UK renewables obligation
11	1	Ghana	Ghana: East Maprusi solar project (RESPRO)
	2	Ghana	Ghana wind energy project
	3	Zambia	Zambia PV energy services companies
	4	Brazil	Brazil's rural electrification programmes
12	1	Eastern Caribbean	Policies for sustainable energy solutions - geothermal power development in the Eastern Caribbean
	2	Mexico	Mexico encourages renewables
	3	China	Huarci, Barkol, Xinjiang, China: a wind power village system project developed by harnessing a poverty alleviation loan

Energy Efficiency

Module #	Case study #	Country	Case study title
14	1	China	EU-China partnership on climate change - clean coal technologies
15	1	United Rep. of Tanzania	Lighting retrofitting in ranzania
	2	United Rep. of Tanzania	Tanzania: power factor correction
	3	Zambia	Zambia: automatic load control and alternative energy supply at Lusaka sater and sewerage company
	4	Zambia	Zambia: university energy assessment
	5	Ghana	Why DSM initially failed in Ghana
16	1	Ethiopia	Solar water heaters in Ethiopia
17	1	Japan	Japan: overview of energy efficiency measures
	2	South Korea	Rational energy utilization act of South Korea
	3	China	China's energy conservation policy
	4	Denmark	Denmark: electricity distribution companies as key actors in energy efficiency policy
	5	Belgium	Flanders' energy savings obligations on electricity grid operators
18	1	U.S.A	Companies forge individual paths to energy management

Financing

Module #	Case study #	Country	Case study title
19	1	Australia	Sustainable energy authority in Australia
	2	South Africa	Improving energy efficiency in Ekurhuleni Metropolitan Municipal (EMM) Buildings, South Africa
	3	Latvia	Efficient lighting in Latvian Academy of Sport Education (LASE), Latvia
	4	Ireland	Passive solar design in local government offices in Ireland

5. HOW TO USE THE TRAINING PACKAGE

5.1. Training tools

Each module provides an introduction with key aims for the module and what you should expect to know when the module has been completed. Each module also includes a number of training tools that can be used to enhance understanding of the module's contents and to deepen your knowledge of the subject. These are:

- Review questions

Distributed in the core text of each module, there are a number of questions for the reader to answer in their own time. Brief answers to each question are available at the end of each module but the questions are also intended to stimulate ideas for independent research on the internet or textbooks.

- Exercises

Contained within most modules there are suggested exercises. These can be used by students to test their understanding or by teachers to set as exercises during the course and work through answers during lessons with the students

- Presentations/suggested discussion topics

Each module includes a PowerPoint presentation, which presents suggested discussion topics. Teachers and students can use this during a course to lead discussions. The discussion topics are also a basis for research for students.

- Relevant case studies

Each module makes reference to a number of examples. At the end of most modules, there are also additional case studies available, which provide detailed accounts of examples relating to the topic(s) covered in the module.

- References and Internet resources

At the end of each module there are references and a list of internet resources. These can be used by both students and teachers to maximize benefit from the course and deepen their knowledge of the subjects they are most interested in.

- Glossary of terms

A glossary of terms and key concepts is provided at the end of each module.

5.2. Suggested course schedules

There are a number of ways to use this training package. It can be used as part of an intensive training course, delivered over a few days, or as a longer duration course based at an institution over weeks or months. It is also possible to use it as self-study course.

The course is split into five main sections:

- Introduction;
- Energy regulation;
- Renewable energy;
- Energy efficiency;
- Financing.

It is recommended that all five sections be taught together in one course. A second recommended option is to group the study into a "renewable energy package" consisting of energy regulation and renewable energy, or an "energy efficiency package" consisting of "energy regulation" and "energy efficiency". Of course, each section could also be studied separately.

Below are suggested course schedules. It is stressed that these are only suggested programmes of study and you are free to use other methods or time scales.

Intensive course

An intensive course would be over the period of two weeks. The aim would be to cover all the basic material in each module during the course, while providing all the additional material – case studies, references and Internet search suggestions to the students for follow-up study and research once the course is finished.

Below is a suggested schedule for a two-week course using the complete package.

Day 1: Introduction and energy regulation

- Module 1: Overview of renewable energy and energy efficiency
- Module 2: The energy sector in Africa
- Module 3: Introduction to energy regulation

Day 2: Energy regulation

- Module 4: The reform of the power sector in Africa
- Module 5: Regulation types and options

Day 3: Energy regulation

- Module 6: Structure, composition, role of an energy regulator
- Module 7: Formulating regulatory scenarios and national self-assessment

Day 4: Renewable energy

- Module 8: Renewable energy technologies
- Module 9: Impact of different power sector reform options on renewables
- Module 10: Regulatory and policy options to encourage development of renewable energy

Day 5: Renewable energy

- Module 11: Increasing access to energy services in rural areas
- Module 12: Distributed generation: options and approaches

Day 6: Energy efficiency

- Energy efficiency technologies and benefits
- Supply-side management (SSM)

Day 7: Energy efficiency

- Demand-side management (DSM)
- Impact of different power sector reform options on energy efficiency

Day 8: Energy efficiency

- Regulatory and policy options to encourage energy efficiency
- Industrial energy efficiency and systems optimization

Day 9: Energy efficiency

- Energy efficiency in buildings

Day 10: Finance

- Financing options for renewable energy and energy efficiency

Long duration course

The structure and materials provided in the modules lend them to use in an educational institution, where a course could be given over the period of a few weeks or months, either as part of an established course or as an evening class.

An example of a long duration course is given below, using the length of a typical university semester, four months and estimating a minimum of half a day teaching time per week.

Month 1

Week 1	Introduction and Energy regulation	Module 1: Overview or renewable energy and energy efficiency
		Module 2: The energy sector in Africa
Week 2		Module 3: Introduction to energy regulation
Week 3		Module 4: The reform of the power sector in Africa Module 5: Regulation types and options
Week 4		Module 6: Structure, composition, role of an energy regulator

Month 2

Week 5	Energy regulation	Module 7: Formulating regulatory scenarios and national self-assessment
Week 6		*Review of what has been learnt in Modules 1 to 7*
Week 7	Renewable energy	Module 8: Renewable energy technologies
Week 8		Module 9: Impact of different power sector reform options on renewables Module 10: Regulatory and policy options to encourage development of renewables

Month 3

Week 9	Renewable energy	Module 11: Increasing access to energy services in rural areas
Week 10		Module 12: Distributed generation: options and approaches
Week 11		*Review of what has been learnt in Modules 8 to 12*
Week 12	Energy efficiency	Module 13: Energy efficiency technologies and benefits
Week 13	Energy efficiency	Module 14: Supply-side management
Week 14	Energy efficiency	Module 15: Demand-side management

Month 3

Week 13	Energy efficiency	Module 16: Impact of different power sector reform options on energy efficiency Module 17: Regulatory and policy options to encourage energy efficiency
Week 14	Energy efficiency	Module 18: Industrial energy efficiency and systems optimization
Week 15	Energy efficiency Finance	Module 19: Energy efficiency in buildings Module 20: Financing options for renewable energy and energy efficiency
Week 16		*Review of what has been learnt in Modules 13 to 20*

5.3. SELF-TAUGHT

The materials and learning tools provided in the training package make it easy for individuals to use it to teach themselves more about regulation and sustainable energy. Apart from the main text, there are questions and exercises, as well as references, therefore a teacher, although a source of support, is not indispensable. The following paragraphs provide some advice on individual learning using the materials provided.

1. Remember that people learn in different ways (and at different speeds). The units of the module follow a logical progression in setting out and elaborating the principles of the subject, but you can move about between units and topics if this suits you.

2. There is no single rule about how best to learn the kind of material presented in this training package. A way to start is to familiarize yourself with the different materials provided, the text, the presentations, the case studies and take a look at the references. Have a look through the text, and begin to familiarize yourself with the subject matter and coverage of each module.

3. You will find a summary of the subject matter in the module introduction, which covers the key aims and concepts of each module and what you should know by the end. Look out for the topics that are most interesting and relevant to you, and as you study note what seems more difficult and what seems easier.

4. Learning is an iterative process and it is often useful to go back to something studied earlier. You may also find it useful to move about between different units according to what interests you, or according to the connections that you make between different issues.

5. The training package has many questions and activities to help you acquire the necessary analytical skills, and you should take notes and actually note down your answers to questions as you go along. Answers to questions are sometimes provided but try to answer them on your own first before consulting the ones supplied.

6. You are encouraged to take notes or create a personal study journal, as this activity helps you to keep a record of your learning. You can reflect on what you think is most important, interesting and relevant, and put it into your own words. This is a powerful means of acquiring and developing a sound knowledge of the subject. Notes should be well organized and well structured (i.e. making use of headings, indentations etc.), and clearly convey the meaning of what they refer to.

7. As you read you should simultaneously be:

    - Thinking about the content;
    - Making notes where appropriate;
    - Relating ideas and concepts;
    - Comparing information with your existing knowledge;
    - Considering the application of what you are studying.

8. Glossaries, key terms, concepts, abbreviations and acronyms: studying a new subject typically involves learning its specialized vocabulary and often a whole new range of acronyms. Specialized terms are an indispensable form of shorthand for key concepts, and how they are applied to the issues and questions with which the discipline is concerned. Lists of key terms and concepts, and acronyms and abbreviations are provided, where relevant, in the text of each module. It is also a good idea for you to build up your own glossary as you work through the units in order to develop and reinforce your understanding.

9. Questions: throughout the modules you are asked questions, which we call "Review Questions". Some of these have answers are included at the end of the module. Along with the discussions, it is not compulsory that you answer them all. However, depending upon your preference you may like to attempt them on your own, discuss and work them through with fellow professionals within your work or country location.

10. Using the Internet: the modules also make reference to websites, which offer a very rich source of further information. If you have access to the Internet this can be a powerful learning tool, to accompany you on this course. The links and references to websites provided are just a sample of some of the better websites found at the time of writing the module. You do not have to visit these websites, and indeed it cannot be guaranteed that the links will still work or that the third party resources referred to will be found on the Internet for any specific time period. If you want to download materials from the Internet, and build up your own electronic library based on the references in this courseware, you are strongly advised to do this as soon as possible, as this will give you a better chance of accessing materials before they are moved or disappear.

SUSTAINABLE ENERGY REGULATION AND POLICY-MAKING FOR AFRICA

INTRODUCTION TO THE UNIDO/REEEP TRAINING MANUAL

'SUSTAINABLE ENERGY REGULATION AND POLICYMAKING FOR AFRICA'

User Manual

SUSTAINABLE ENERGY REGULATION AND POLICY-MAKING FOR AFRICA

Aims of theTraining Package 1/2

- Training package aims at building capacity and knowledge on how to foster regulatory and policy environments that will better aid the adoption of more economically (in the long-term) and environmentally sustainable methods of energy supply and utilisation.
- The training package focuses on the industrial, commercial and urban domestic sector as well as the rural energy environment in the developing countries of Africa.

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SUSTAINABLE ENERGY REGULATION AND POLICY-MAKING FOR AFRICA

Aims of the Training Package 2/2

- To provide a better understanding and awareness of the benefits of renewable energy (RE) and energy efficiency (EE) technologies.
- To provide an improved knowledge of proven policy and regulating models, mechanisms and practices available to support the development of RE and EE.
- To show how sustainable energy development can be promoted and supported by national energy regulations and policies

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SUSTAINABLE ENERGY REGULATION AND POLICY-MAKING FOR AFRICA

Training Package Target Audience

- This training package is relevant to the needs of developing country governments, in particular to the policy-making bodies and regulating institutions responsible for the development and functioning of the national energy sector.
- In addition, the training package is also relevant to a wide variety of governmental and non governmental organizations in the energy sector, including private companies, utilities, universities, research institutes, developmental agencies, NGOs and others, which are involved in policy making, policy analysis, regulation and standard development.

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Structure of the Training Package 1/2

The modules of the training package are designed to:

- Provide an introduction to energy regulation, focusing on the electricity market, and how it relates to power sector reform;
- Provide an introduction to renewable energy and energy efficiency technologies and programmes;
- Outline issues affecting the implementation of sustainable energy technologies;
- Highlight useful examples of 'good practice' and explain why they are effective;
- Provide detailed studies;
- Provoke discussion amongst participants.

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Structure of the Training Package 2/2

The training package consists of a user manual and four separate 'sub-packages'. These sub-packages cover:

- Introduction to renewable energy and energy efficiency and the energy sector in Africa;
- Energy regulation (mainly covering electricity);
- Renewable energy;
- Energy efficiency.

In addition to the above sub-packages, an additional final module (Module 20) examines the issues, barriers, challenges and opportunities surrounding the financing of renewable energy and energy efficiency projects and programmes.

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Overview of Modules 1/5

INTRODUCTION SUB-PACKAGE:

- Module 1 – Overview of renewable energy and energy efficiency
- Module 2 – The energy sector in Africa

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Overview of Modules (2/5)

ENERGY REGULATION SUB-PACKAGE:

- Module 3 – Introduction to energy regulation
- Module 4 – The reform of the power sector in Africa
- Module 5 – Regulation types and options
- Module 6 – Structure, composition, role of an energy regulator
- Module 7 – Formulating regulatory scenarios and national self-assessment

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Overview of Modules (3/5)

RENEWABLE ENERGY SUB-PACKAGE:

- Module 8 – Renewable energy technologies
- Module 9 – Impact of different power sector reform options on renewables
- Module 10 – Regulatory and policy options to encourage development of renewable energy
- Module 11 – Increasing energy access in rural areas
- Module 12 – Distributed generation: options and approaches

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Overview of Modules (4/5)

ENERGY EFFICIENCY SUB-PACKAGE:

- Module 13 – Energy efficiency technologies and benefits
- Module 14 – Supply-side management
- Module 15 – Demand-side management
- Module 16 – Impact of different power sector reform options on energy efficiency

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SUSTAINABLE ENERGY REGULATION AND POLICY-MAKING FOR AFRICA

Overview of Modules (5/5)

ENERGY EFFICIENCY SUB-PACKAGE cont.

- Module 17 – Regulatory and policy options to encourage energy efficiency
- Module 18 – Industrial energy efficiency and systems optimization
- Module 19 – Energy efficiency in buildings
- Module 20 – Financing options for renewable energy and energy efficiency

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Learning Tools

Each module contains the following learning tools:

- Detailed case studies
- Questions and answers
- Exercises
- Presentations
- Discussion topics
- References / Internet resourcesa
- Glossary of terms

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SUSTAINABLE ENERGY REGULATION AND POLICY-MAKING FOR AFRICA

Using the Training Package

The training package is intended to be a flexible learning tool. Some suggested course schedules are:

- Intensive course
  - Two weeks
- Long duration course
  - Four months / one semester
- Self-taught
- Used as a reference source

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