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# Energy in Africa

Challenges and Opportunities

 Springer Open

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# Foreword

Access to energy remains a major developmental challenge for the African continent. Recent estimates suggest that about 600 million people or above lack access to electricity. More than 700 million people cook with traditional biomass. Sustainable Development Goal 7 that targets affordable and clean energy therefore speaks to a very important challenge that faces the African continent, especially sub-Saharan Africa.

There is a wide recognition regionally and globally that this challenge needs to be addressed with some urgency. The African Development Bank (AfDB) has, for instance, identified access to energy as one of its High 5 s—that is, one of the five areas that must receive priority as it rolls out its development strategy for the subcontinent. The energy sector has also been identified to be of high importance by an overwhelming number of countries through their nationally determined contributions, as per their commitment to the Paris Agreement. Improving access to energy does not only lead to a reduction of indoor pollution. There are other benefits that include improved educational outcomes (school children will have access to lighting to study), improved health (through the possibility of storing medicines in refrigerators) and potential reduction in rural–urban migration.

The timing of the publication of *Energy in Africa: Challenges and Opportunities* is right. The book pays particular attention to the mix of technologies that would be needed to address energy poverty in the subcontinent. The technologies include those harnessed from both renewable and non-renewable sources. The huge potential from the renewables and opportunities for mixed technologies that do not exclude traditional fuels have been highlighted. The five chapters of this book certainly tackle the major challenges and opportunities in Africa related to access to energy.

There is no doubt that this book makes very useful contributions to our understanding of the ways to address energy access challenges in sub-Saharan Africa. The specific appeal to national governments, foreign investors and the international community to make substantial investments and to commit to making the energy sector effective and efficient is noteworthy. The thinking reflected in this book reinforces previous and emerging knowledge and strategies to address access

to clean energy in Africa. Notwithstanding, there is still an avenue to further the debate and the analysis to place energy access in a much broader sustainable development context, especially with respect to expanded electrification goals.

This book pursues an important journey. A critical look is still needed on the institutional and policy frameworks that shape the energy sector. Of particular interest would be how to reform the institutions involved in the generation and distribution of energy. In the same vein, a better understanding of how energy policies in countries with low energy access can address the energy poverty challenge will provide useful insights. The governance of the energy sector needs to be viewed within the context of the sector's value chain. This is particularly significant as the value chain involves multiple players over multiple scales.

It is my hope that this book provides some food for thought for researchers, development agencies, policy makers, bilateral and multilateral partners, and the private sector on the opportunities to ensure access to affordable and clean energy to poor households of the African continent. The insights from the book should be understood in the context that country and regional specificities exist.

Accra, Ghana

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## **About the Fondazione Eni Enrico Mattei (FEEM)**

The Fondazione Eni Enrico Mattei (FEEM), founded in 1989, is a non-profit, policy-oriented, international research centre and a think tank producing high-quality, innovative, interdisciplinary and scientifically sound research on sustainable development. It contributes to the quality of decision-making in public and private spheres through analytical studies, policy advice, scientific dissemination and high-level education. Thanks to its international network, FEEM integrates its research and dissemination activities with those of the best academic institutions and think tanks around the world.

## **About FEEM's Energy Scenarios and Policy (ESP) Research Programme**

The ESP research programme aims to carry out interdisciplinary, scientifically sound, prospective and policy-oriented applied research, targeted at political and business decision makers. This aim is achieved through an integrated quantitative and qualitative analysis of energy scenarios and policies. This innovative and interdisciplinary approach puts together the major factors driving the change in global energy dynamics (i.e. technology, economy, geopolitics and sociological aspects). The ESP programme applies this methodology to a wide range of issues (energy demand and supply, infrastructures, financing, market analyses, socio-economic impacts of energy policies) that are explored from economic, geopolitical and institutional perspectives.

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# Abstract

Energy poverty is a major barrier to development, and this problem is particularly evident in sub-Saharan Africa, where the majority of the population lives without access to electricity and clean cooking. The continent has more than enough resources to satisfy its current and future demands, but most countries struggle with significant difficulties to attract large investments and to support virtuous small businesses, both necessary to run the race towards universal access to modern energy.

After introducing the problem in its most critical features, this book looks at existing opportunities, with the double objective of providing a snapshot of Africa's resources (both renewable and non-renewable) and to discuss their potential in the light of today's global energy landscape. While the main focus is on the specific challenges of sub-Saharan Africa, when it comes to resources an effort is made to paint a complete picture of the continent, implicitly suggesting the potential for a pan-African energy future.

In the final chapter, the book sheds light on the level of investments required to scale up Africa's energy systems, discussing the role of international financing institutions and calling for greater coordination among European initiatives on the one hand and more effort to tackle the problem of clean cooking on the other hand.

# Introduction

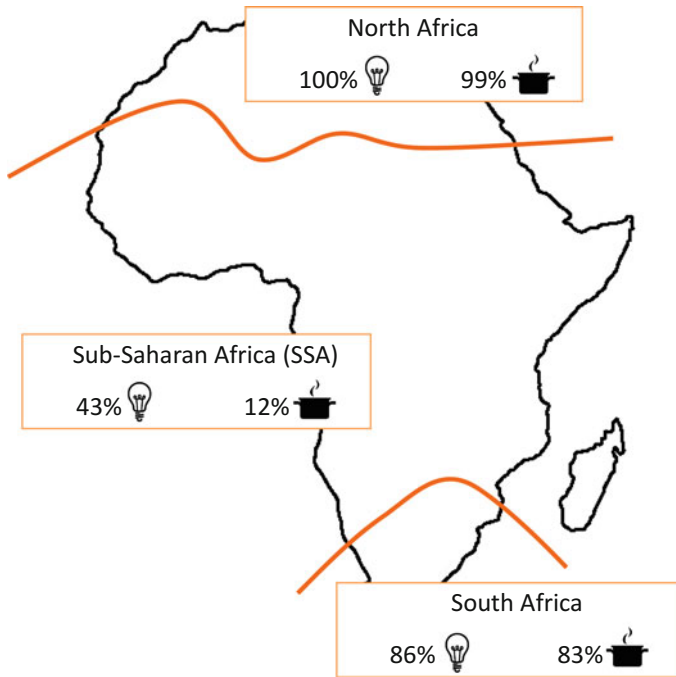
Africa is on the move. Since 2000, the continent has seen rapid economic growth (with real GDP growth rates outperforming other major regional economic blocs), improving social conditions (with falling infant mortality rates and rising life expectancies) and progressive political liberalization (if in the 1990s only about 5% of African nations were considered to be democracies, today only a handful of the 55 African states do not have a multiparty constitutional system).

In this context, making energy—and notably electricity—reliable and widely affordable for the population has been and continues to be a key challenge, particularly for sub-Saharan Africa. In energy terms, Africa can be divided into three different regions (Fig. 1). North Africa is almost entirely electrified, and most households also have access to clean cooking. The situation is similar in South Africa (the country), which is predominantly electrified. In the rest of sub-Saharan Africa (SSA) however, most people have no access to power (600 million) and still rely on solid biomass (wood and organic waste) for cooking (780 million).

Notably, two-thirds of SSA's population do not have access to power, while the remaining one-third cannot consume as it would like, due to regular blackouts and brownouts resulting from structural constraints of the available power supply. Given this peculiar situation, this book mainly focuses on energy issues in SSA, where the situation is the most dramatic.

In the SSA region, efforts to promote energy access are gaining momentum, but they are outpaced by population growth. Cities constantly grow with very little urban planning, while villages are scattered over large areas with little or no real infrastructural connection. In this context, reaching universal energy access becomes a real race against time.

Notwithstanding the importance and size of these challenges, Africa's energy sector remains one of the most poorly understood parts of the global energy system. In this context, this book aims at contributing to the understanding of Africa's current and future energy challenges and opportunities.



**Fig. 1** Three zones of access to electricity and clean cooking. *Source* author's elaboration on IEA, Energy Access database, accessed November 2017

The book develops along four chapters. Chapter 1 analyses the current status of Africa's access to modern energy and points at some key challenges on the way to universal access. Chapter 2 focuses on Africa's hydrocarbon resources and infrastructure and proposes a long-term perspective on their development. Chapter 3 focuses on Africa's renewable energy potential and the actions needed to best value it. Chapter 4 analyses the investments required to scale up Africa's energy systems, sheds light on the key barriers hindering them, and elaborates on potential solutions.