



Unleashing the power of human capital for effective deployment of REs in East Africa

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Abstract¹

Over the past decade, the debate on access to energy and sustainable energy strategies for developing countries has tended to lean mostly on technology, finance, and policy as key drivers. Thanks to this approach, there has been some progress in expanding global energy access – although the goal of universal access is still far off and is likely to remain so for the next two decades. Scaling up strategies for access to energy requires a different perspective and an innovative approach to capacity building. In line with the ethical imperative of the 2030 Agenda for Sustainable Development of “no one left

¹ The contents of this position paper are a short summary of a more extensive work:

Colombo, E. et al. 2017. “State of Energy Access Report Special Feature: The Power of Human Capital: Multi-Level Capacity Building for Energy Access”. Background paper prepared as part of the State of Electricity Access Report of the World Bank (<http://documents.worldbank.org/curated/en/104731494940162971/pdf/BRI-P148200-PUBLIC-FINALSEARSFHumanCapitalweb.pdf>).

behind” and its focus on people, the cross-cutting role of human capital (individually and collectively, as communities and institutions) becomes crucial both as a catalyst and a booster. Indeed, without the proper human resources, it will be impossible to achieve a transformative change in energy access – one that is efficient, effective, equitable, empowering, and long lasting. That is why human capital is now recognized as a core dimension for any strategy designed to reduce energy poverty at the global and local levels. In this perspective capacity building needs to go beyond adding a training component to any intervention. It needs to be designed to fully deploy the power of human capital as a win-win opportunities for local community and private investors. Indeed while fostering ownership and empowerment it may create the enabling working environment to reduce some of the people-related risk for private investors.

Background and Introduction

A paradigm change is requested if we wish to support the **penetration or Renewable energies within the whole Sub Saharan Africa**. In line with the vision of the 2030 Agenda for Sustainable Development “**no one be left behind**” and the clear focus on people, the cross-cutting role of human capital (individually and collectively) has been awarded with a crucial role.

Indeed, without the proper **human resources**, it is recognized that it will be not easy to achieve the **transformative change for sustainable energy strategies** that is requested by the today challenges of the African continent. The **right skills** and **competencies** are needed for the design, uptake, and sustainable management of technologies, business models, and enabling policy framework. At the same time, the introduction and adoption of new or improved renewable energy technologies require new skills for installation, maintenance, and service. The **new and diverse energy markets** require that different players understand their role.

In strengthening the **role of people throughout the entire energy supply chain** – from production to users – capacity building and training activities may develop the local expertise needed to replicate and scale-up

successful initiatives, support ownership of stakeholders, and **foster long term sustainability**.

Objective: human capacity and sustainable energy strategies

Sustainable Energy Solutions are pre-requisites for improving the quality of life and enabling the socio-economic development. Appropriate energy solutions and technology choices must respond to the **needs, capacities, and aspirations** of people and **be absorbed within the indigenous culture**, adapted and later improved at local level. For these reasons, people should be at the centre of any energy solutions and capacity building an asset for long term strategy.

Over the past 20 years, there has been a major rethink of the concept of capacity building. To begin with, the notion of “capacity” has evolved and now the emphasis is on the **ability of individuals**, organizations, and societies to set and achieve their **own development objectives**, and the **ability of human beings to perform, self-sustain, and self-renew**. There is also a recognized need to go beyond the direct equivalence that defined “**capacity building as training**” and to extend the functional dependency of capacity building toward a wider vision of **education as a fundamental human right**. This

approach is also in line with the original statement included in the 1992 UN Sustainable Development Agenda 21: *“The ability of a country to follow sustainable development paths is determined to a large extent by the capacity of its people and its institutions that complements its ecological and geographical conditions”*. Such a holistic vision includes various sets of actions like: (i) **building abilities**, relationships and values; (ii) strengthening **the processes and the rules that influence collective and individual behavior**; and (iii) **enhancing technical competences, soft skills, and attitudes** to enable them to be proactive players for development. This viewpoint is also highlighted in the report by the International Energy Agency (IEA) and World Bank’s **“Sustainable Energy for All 2015 – Progress Toward Sustainable Energy”**, which includes capacity building as one of the four complementary themes that are crucial for making any progress in broadening energy access solutions

Main task: a new asset for the energy supply chain

Energy is a means to achieve sustainable development and **not an end in itself**. Rather, the success of energy initiatives will be measured by the improved health of the beneficiaries, number of new jobs created locally, number of lives saved, increased local/national economic output, and increased level of education – and not just kilowatts per hour of energy generated.

Within this frame, **the traditional energy chain will soon no longer exist**. The energy supply chain from the generation plant to the consumer, once fairly switching away from a few large centralized power plants coupled with widely extended distribution lines, is evolving into a more flexible, upgradable, and

diverse model that focuses on distributed energy generation based on renewable energy technologies (RETs). **Consumers are turning into producers**, transforming the energy conversion chain into a **multi-dimensional, multi-layered energy matrix** that is growing more complex and articulated. The search for effective solutions to increase energy access in developing countries has led to the recognition that industries can and should play a crucial role. **Industries that generate their own energy can also increase their income** by selling excess energy and providing an essential community service. A win-win situation can be established by increasing the **efficiency of energy processes** in industries through the **use of waste**; or applying any **source of renewable energy**, along with introducing **electricity as a revenue stream**. The diversification of products and services by local industries increases their resilience and market competitiveness and simultaneously contributes to developing the local community. Local industries that both produce and use renewable energy sources (such as solar, wind, and bioenergy) for their own needs, along with selling the excess energy to the surrounding community, can be defined as “industrial prosumers”. This innovative model is based on the fact that local industries possess the necessary business capacities to run an enterprise and therefore represent a low hanging fruit in the expansion of energy services for the local community. Nevertheless, on top of the business capacities, local industries need the support of energy specialists, technicians, operators, researchers, investors, and supporting institutions (such as governments, universities, and financial organizations) to become effective industrial prosumers. Expanding capacity building initiatives to develop and retain a skilled workforce to meet

these new opportunities will be critical to ensure that new energy markets are developed to achieve the goal of sustainable energy for all.

Recommendations: innovation and creativity for capacity building

Despite a common framework suggesting the most relevant action to be done in the field, does not exist, some recommendations might be drawn. From international experience. They will be essential for fully unleashing the power of human capital and the pillars around which any future innovative scheme need to be developed

- **Diversified targets.** Capacity building should address different beneficiary groups, which may have different access to training opportunities at technical, vocational, or institutional levels.
- **Different skills.** Capacity building interventions should be diversified to address the different needs for skills existing at different levels of the energy supply chain and within different local contexts – and be aligned with the ability of the different target groups.
- **Multitude of stakeholders.** Due to the diverse nature of the required competences, a variety of local, national, and international stakeholders should be involved (even beyond the traditional players of the educational systems).
- **Life-cycle perspective.** People are the catalyst and the drivers of change. Their capacity needs to be developed all along the supply chain of the design solution, and within this approach, linking skills and work needs to be a guiding principle.
- **Comprehensive approach.** Capacity building for energy access should encompass

a comprehensive approach based on human, scientific, organizational, and institutional capabilities.

- **National/regional and local strategies.** The need to strengthen national capacities should be shared by all countries and should be able both to drive national-based priority definition and regional coordination and to assure the support to project-based or specific local actions.

- **Teaching tools.** A mix of tools may be used, varying with the targets and the expected learning outcomes (including training, seminars, workshops, on-the-job tutoring, and site visits).

These essential elements can then be grouped into **three macro-dimensions** to help discern a rational base for capacity building, each of them (**figure 1**) responding to a crucial component of the sector:

- **Energy access is a long-term process** that needs planning and qualified human resources over a variety of diversified subjects and requiring a multitude of skills.

- **An integrated approach is crucial in the whole life-cycle perspective**, from identification to monitoring and evaluation. Capacity building strategies should also benefit from a multi-stakeholder approach, including local teaching institutions, NGOs, and the private sector.

- To couple diversification with integration, ad-hoc strategies need to highlight different **teaching tools for different learning outcomes**. These strategies should include adequate financing over the long term to ensure ownership and sustainability of energy access initiatives.



Figure 1: Multi-level breakdown for capacity building

Level 1: Diversified targets. If the goal is diversifying targets to benefit from any formal (governmental-based) or informal (community-based organization) learning programs initiatives should also include people working in small enterprises, rural industries, the informal economy, self-employment, unemployed, and irregular or precarious employment. Given the diverse nature of the competencies required, a variety of local, national, and international stakeholders need to be involved. Agenda 2030 also highlights the relevance of local institutions and civil society organizations, as well as international cooperation and partnership, to support national plans and create networking among competent people. By expanding the original subdivision proposed by IRENA, three major categories – individual, organization, and government – and within them, a further breakdown (youth, municipalities, and ministries) – a more ready-to-use taxonomy may be drawn (table 1). It is worth underlining that different players could be both targets and beneficiaries for capacity building actions – for example, women trained in certain energy areas can also contribute to spreading technology within their families and local community.

Table 1: Level 1: Diversified targets

Individuals	Organisation	Government
Youth	Public bodies (municipalities, local authorities)	National entities (ministries, national authorities)
Citizen		
Educators	Private Sectors (SMSs, cooperatives..)	Regional level (overarching organisation, networks)
Technicians		
Researchers	Civil society organisations	
Entrepreneurs		
Prosumers		
Public Officers		
Civil Society operators		

Level 2: Comprehensive approach and life-cycle perspective. People are the catalyst and the global driver of change, and technological solutions need to be designed to meet today's and tomorrow's capacity requirements. A good way to do this is with a life-cycle perspective that links skills with labor needs. By establishing solid bridges between the labor market and vocational training and skills development, capacity building becomes more effective and can contribute to closing the gap between job opportunities and required skills. Moreover, beyond the technological capacities and competences linked to the implementation phase of any energy access project, capacity building encompasses a comprehensive approach, including the country's human, scientific, organizational, and institutional capabilities. The goal is to enhance the ability of a country or a body (or a project consortium) to evaluate and address crucial questions related to the economy, finance, and enabling policies – such as a full understanding of potential environmental and social impacts. Monitoring, evaluation, and accountability are key to significantly increase the availability of high-quality, timely, reliable, and disaggregated data and their ex-post analysis. This facilitates designing appropriate corrective measures and pursuing knowledge-based local research and innovation to ensure local ownership and thus the long-term sustainability of energy access initiatives. For

level 2 a taxonomy with five main categories is proposed: **cultural, technological, economic, political, and a cross-cutting dimension (table 2).**

Table 2: Level 2: Comprehensive, life-cycle approach

Culture	Technology	Economy	Policy	Cross Cutting
Behaviour	Ex Ante Assessment Resource Local Constraints Needs/Loads	Business Planning	Enabling environment	Networking
Awareness	Identification & Formulation Energy Solution Planning/Optimisation Implementation and field work	Enterpreneurship	Regulatory Framework	Capacity Building and Life long learning
	Implementation Operation and Maintenance Monitoring and Data Analysis	Financial Scheme	Coherence	
	Ex post Impact Evaluation Continous Research and Innovation			

Level 3: A mix of strategies and teaching tools. Countries should pursue their strategies based on national priorities on capacity building – and whenever available embedding capacity building components within all the existing projects and enforcing national or regional coordination. It is also crucial to promote individual actions following a decentralized and project-based approach for activities that are part of existing projects at the country level. For access to energy, our level 3 combine traditional or participative education, and learning by doing (table 3).

Table 3: Level 3: Mix of strategies and teaching tools

Traditional	Partecipate	Learning by doing
Lecture	Exposure	Assignment
Seminar & Workshop	Assignment	Joint project
Visit	e-collaboration	Technical assistance
e-learning	Project work	Tutoring on the job
Informative campaign	Business Case	Local, regional lesson learnt

These three levels can then be combined to help policymakers come up with a multi-level approach that combines targets, skills, and strategies/teaching tools.

Final Consideration

Achieving universal energy access is a long-term undertaking. Capacity building at both individual and institutional levels plays a key role in ensuring the success of energy access strategies and complementing the technical, financial, and political efforts. Capacity building needs to go beyond adding a training component to any intervention. It needs to be designed to fully deploy the power of human capital as one of the crucial assets of any community.

Our approach based on three elements is now a reference also for the World Bank: (i) a mix of target groups, skills, and stakeholders; (ii) a comprehensive life cycle approach, within the energy supply chain; and (iii) a mix of strategies and tools that can be selected for the various targets and the expected skills to be generated or reinforced. This will facilitate the transformative change that is required to scale up access to energy and sustain local ownership, promote economic development, and ensure long-term impact.