

BUILDING CAPABILITIES IN THE WIND AND SOLAR SUBSECTORS IN KENYA



Kenya is one of the fastest growing promoters of solar and wind power in Africa. These energy sources are increasingly being utilised to ensure energy security, drive Kenya's development, diversify energy sources and create employment and income generating opportunities to the growing population of Kenya. Wind and solar energy development projects provide opportunities to build capabilities at different levels along the manufacturing and deployment chain. However, the contribution of renewable energy sources to Kenya's installed generation capacity has remained insignificant. Further, there is little empirical evidence to show the role solar and wind energy infrastructure specifically plays on economic growth. This brief conveys the results of a stakeholder survey done in 2016 investigating how barriers to diffusion of technologies can be reduced through building requisite skills and capabilities in the solar PV and wind subsectors.

Solar and wind power are more likely to be taken up by different actors when the policy environment promotes the right types of technologies and supports development of the requisite capabilities to utilize those technologies. Both public and private sector actors take part in the innovation activities linked to the two subsectors and should be included in any policy discussion. These findings come from a survey conducted in mid-2016 where the IREK research project undertook a survey of stake-holders' perceptions of the field with 91 policy-makers, energy

professionals and academics from across the renewable energy sector in Kenya. The survey focused on use and practices of wind and solar technologies; current policies for solar PV and wind energy in Kenya and current barriers to diffusion of technologies in these fields. The survey emphasized issues of collaboration and capabilities. Based on the results of the survey, this brief presents some ideas about how barriers to diffusion of technologies can be reduced through building requisite skills and capabilities in the solar PV and wind subsectors.

DEFINITION OF CAPABILITIES

Capabilities can be defined as having the capacity (resources, skills/competences and knowledge) to carry out a task. These include technological capabilities (e.g. manufacturing, installing, operation and maintenance) and soft aspects of capabilities such as the ability to organise a project, planning, financial managements etc. Local capabilities signifies domestic (Kenyan) as opposed to global capabilities but can also refer to capabilities at the sub-national (county, village) level.

SURVEY RESULTS

Kenyan stakeholders' understanding of capabilities associated with solar and wind energy

The survey sought stakeholders' opinion on the extent of capabilities for deployment of technologies and consequently the necessary type and nature of external support in this regard.

Kenyan stakeholders' understanding of policy support for capability building

The results show that:

- The policy environment in Kenya is conducive to supporting capability building efforts but their ineffective implementation affects the diffusion of wind and solar energy technologies.
- Whether adequate and sufficient training opportunities are available for policymakers to make relevant assessments and decisions regarding promotion of energy technologies in Kenya should be investigated further.
- Different organizations in both the public and private arenas have the ability to influence policies related to renewable electrification in Kenya. This is mainly through advocacy, publication and publicizing research results and success cases as well as training events.

According to the majority of respondents renewable electrification provides opportunities for capability building in Kenya both in the wind and solar sub-sectors in terms of both managerial and technical skills. Such capabilities could be increased through enhanced selection and use of solar PV and wind technologies.

Renewable technologies ability to contribute to capability development

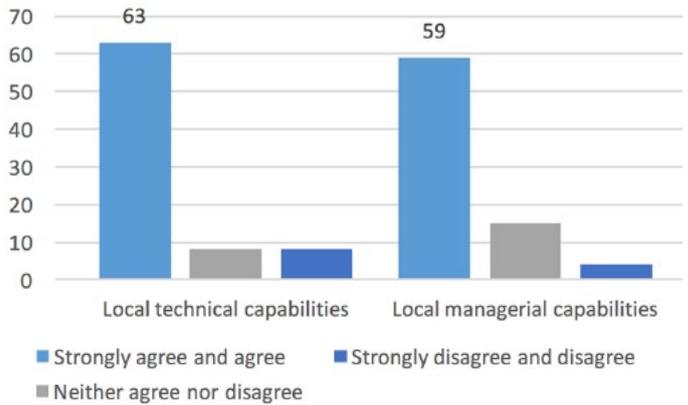


Figure 1: Respondents understanding of renewable technologies contribution to development of technical and managerial capacity

Strength of capabilities in Kenya in solar PV

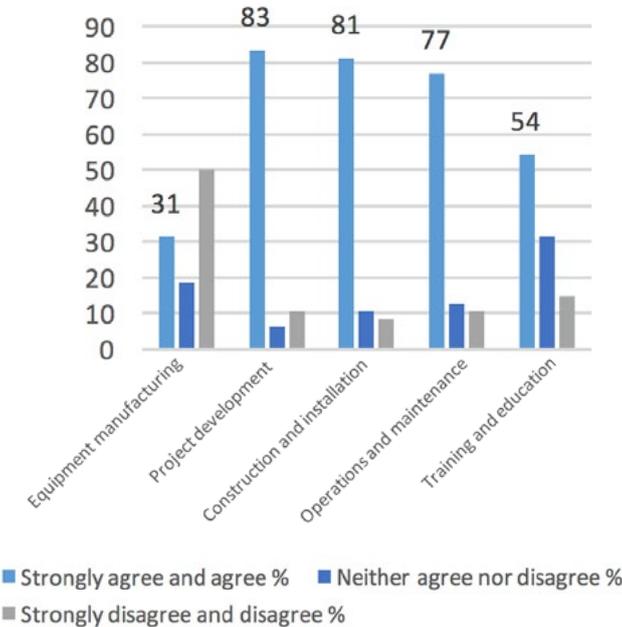


Figure 2: Respondents understanding of Kenyan capability strengths in solar

Strength of capabilities in Kenya in wind

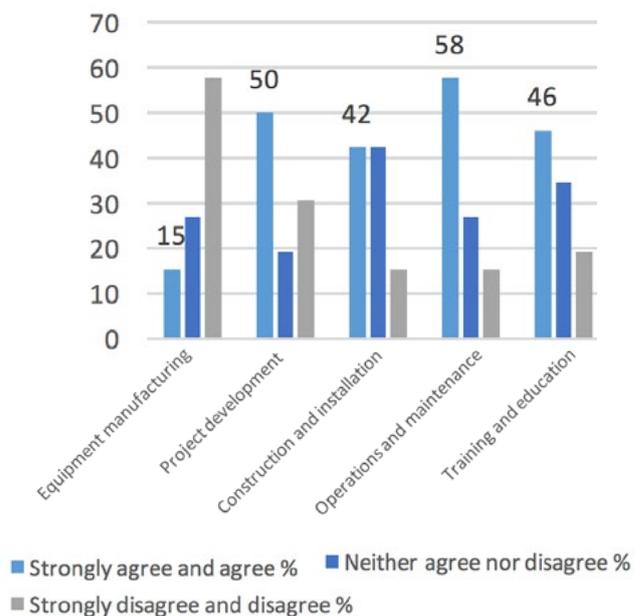


Figure 3: Respondents understanding of Kenyan capability strengths in wind

- Between the two sub-sectors, wind was more reliant on foreign firms across all capability areas. This suggests that the Kenyan wind innovation system may be weaker than its solar counterpart.
- There is a high level of operations and maintenance capacity in Kenya in the wind sub-sector when compared with solar PV.

- There is lack of equipment manufacturing expertise in both sub-sectors which may contribute to dependence on foreign firms for acquisition of capabilities in this particular area.
- A key barrier to capability building across both wind and solar is lack of local training and education opportunities available at colleges and universities.

Point to note: The results presented are inconclusive and do not provide explanations behind the stakeholders' opinion about the different capability issues. Ongoing studies in the IREK project will help to shed more light on this. Read the entire survey report at irekproject.net

3 OVERALL POLICY AND PRACTICE RECOMMENDATIONS

- 1. Policy makers and other stakeholders including researchers should look into ways of building capabilities in technology equipment manufacturing and operations and maintenance capabilities.**
- 2. The government should promote policies that enhance local capability building.**
- 3. Stakeholders should support a platform for sharing knowledge and experiences.**

Recommendations on technology manufacturing, transfer and use:

The perceived lack of good physical technology equipment manufacturing capability for wind and solar and lack of support for locally produced technologies from East Africa, suggests:

- That the Government should proactively work to boost production capability of local actors for both technologies.
- The importance of building a strong local innovation system that nurtures production capacity in the area of solar and wind energy in Kenya.
- When selecting technologies, capabilities in operations and maintenance as well as the quality of equipment are essential and would minimize dependence on foreign or external expertise.

Recommendations on key training needs for personnel involved in the solar and wind sub-sectors:

- More assessment of the current situation needs to be conducted to help understand what training is needed and where.
- Concerted effort between actors involved in solar PV and wind projects in the public and private sector to ensure that they have adequately trained staff.
- More research on the level of in-house training that takes place within firms and organizations involved in this field to provide additional context.
- A review of county level vocational training efforts, particularly in counties that have large or large numbers of renewable energy projects.
- Universities and other parts of the education system e.g. vocational training should investigate more in what specific training may be useful to develop.

Policy options for policy makers and researchers on technology equipment manufacturing and operations and maintenance capabilities issues:

- Policy makers could focus on building the industrial manufacturing base in order for Kenya to become the home of solar PV and/or wind original equipment manufacturers whose products could then be used in-country and exported. This would enhance longer term job creation and economic growth.
- More research by academics and more consideration by policy makers is required as to whether focusing on increasing access to energy utilizing foreign technology creates transferable skills and opportunities for employment and viable operations and maintenance businesses beyond the wind and solar PV sub-sectors.

Recommendations to enhance interaction and thus common understanding of the status quo in the wind and solar energy subsectors in Kenya:

- Create a platform or improve existing platforms where key actors interact and share knowledge and experiences as well as develop strategies how to grow the wind and solar sectors in Kenya.



Reflections for practitioners

When designing projects reflect on:

- What is the nature and extent of capabilities?
- Who has these capabilities?
- What relevant actors do not have these capabilities?
- What types of learning can we draw from these capabilities and how can this feedback be used to improve the system or project?

Capability is not just about generation of technology, it is also about diffusion of products and knowledge.

Within projects, new or modified technologies or knowledge will be generated but in the process, new capabilities will be gained through the use of technologies and knowledge developed by others.

Reflections for policy-makers

When designing policies, policy makers should reflect on:

- Building or enhancing capability of local actors.
- Building a strong local innovation system.
- Building an industrial manufacturing base
- Support development of relevant educational curriculum that promotes training at research, universities and technical and vocational colleges.



FURTHER READING

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The IREK project is a development research project on Innovation and Renewable Electrification in Kenya funded by the Danish Ministry of Foreign Affairs with research partners at Aalborg University (Denmark) and the African Centre for Technology Studies and Moi University (Kenya). IREK seeks to provide a better foundation for selecting and deploying available technologies in a way that increases inclusiveness and contributes to poverty reduction. This policy brief is an introduction to policy-makers and other stakeholders about important research findings.

Read more about the IREK project at IREKPROJECT.NET

