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POLICY BRIEF

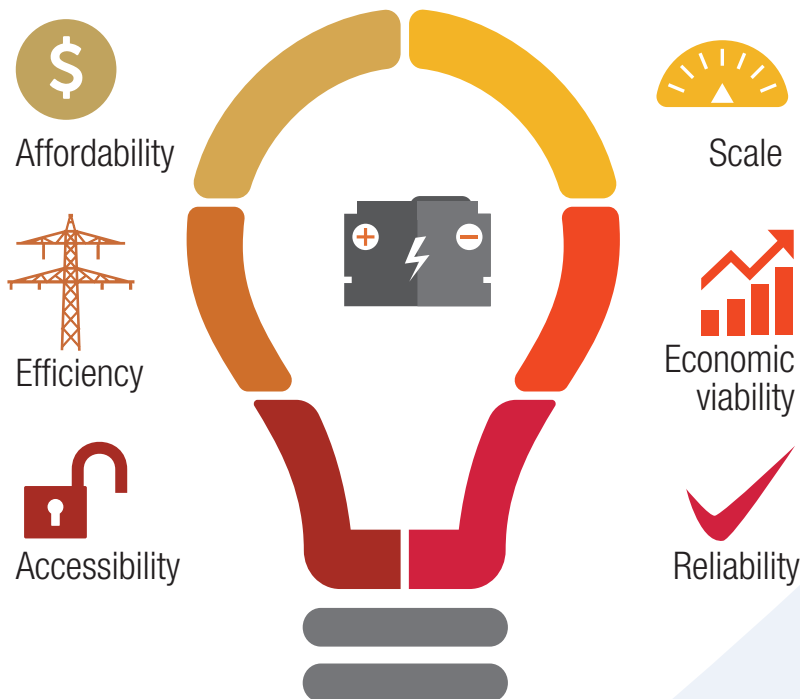
# TRANSFORMATIONAL ENERGY ACCESS

While energy access has received ever-greater attention in recent years, this attention has focused overwhelmingly on the benefits to households of access to electricity to meet basic needs and on the social and environmental aspects of the issue. *The Least Developed Countries Report 2017: Transformational Energy Access* addresses the role of energy in the structural transformation of the least developed countries, through transformational energy access, in order to meet energy needs for production as well as domestic purposes (figure 1).<sup>1</sup>

Figure 1. Transformational energy access means sufficient, reliable and affordable energy for all types of productive use

Key points

- Fulfilling the economic potential of increased access to modern energy in the least developed countries requires moving beyond a focus on minimal household needs, towards transformational energy access
- This entails meeting the energy needs of producers with regard to accessibility, scale, reliability, economic viability, affordability and efficiency
- Achieving transformational energy access requires a systemic approach in the energy sector, and the integration of energy strategies with development strategies
- Achieving transformational energy access also requires increased development finance and technology transfer to the energy sector



Source: UNCTAD, 2017.



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<sup>1</sup> UNCTAD, 2017, *The Least Developed Countries Report 2017: Transformational Energy Access* (United Nations publication, sales No. E.17.II.D.6, New York and Geneva).

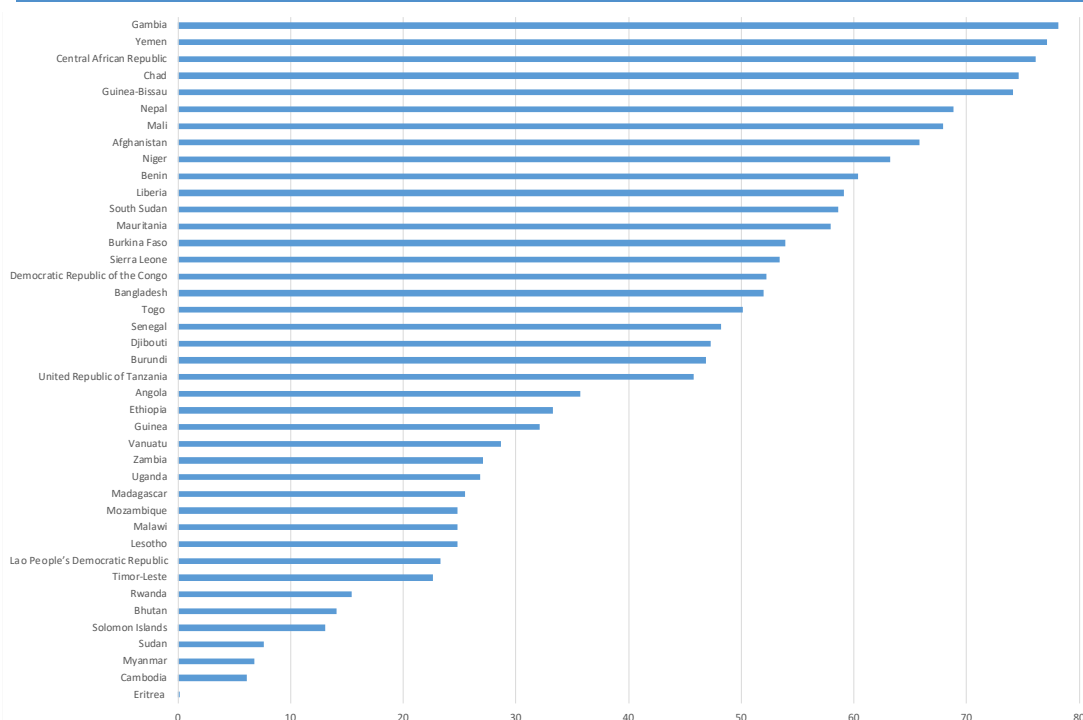
## What is transformational energy access?

Energy requirements for productive uses differ widely across sectors and activities, but are typically much greater than in the minimalist view of universal access as the physical connection of households to sources of electricity, as envisaged by Sustainable Development Goal 7. Unless producers have access to the energy needed to expand and upgrade productive capacities, the unprecedented

development opportunities offered by increasing such access and by recent technological advances in the sector will be largely missed.

Currently, 42 per cent of enterprises in the least developed countries identify the lack of consistent access to energy as a major constraint (figure 2). Three quarters of firms experience outages, which occur on average 10 times each month and last an average of nearly five hours. The resulting losses amount to 7 per cent of total sales.

**Figure 2. Percentage of firms identifying the lack of consistent electricity supply as a major constraint**



Source: UNCTAD, 2017.

Note: Data from most recent surveys available.

Transformational energy access requires, in particular, the following:

- **Accessibility:** Producers should have access to the forms of energy they need to allow them to raise productivity, adopt new technologies and production methods and develop new products
- **Scale:** The quantity and quality of energy supply should be in line with the needs of producers
- **Reliability:** A continuous and reliable supply of energy is required for productive uses, through a high-quality and well-maintained electricity infrastructure
- **Economic viability:** Financially sustainable energy systems generating adequate rates of return are required, and should be able to operate effectively and expand to meet future demand
- **Affordability:** Costs to end users should

be limited to ensure competitiveness

- Efficiency: Access to forms of energy that are efficient for end uses in the productive process should be ensured, along with efficiency in the production and distribution of energy itself

Adequate and reliable electricity supplies are critical. If the scale of supply is limited, there is a risk of skewing the development process towards a proliferation of low-productivity household-level micro-enterprises rather than achieving a more transformative development process. Failing to address current and prospective energy needs for structural transformation could restrict the least developed countries on a suboptimal development path for many decades, given the long-term nature of investments in electricity infrastructure.

## Electrifying development

Central to transformational energy access is access to electricity, and the most effective means of achieving access, where feasible, is through upgrading and extending existing grids and widening access within areas already covered. However, this option is generally uneconomic beyond urban and peri-urban areas, and the process of grid extension, in particular, takes time due to the physical investment required and due to resource constraints on investment.

In more remote rural areas beyond the reach of existing grids, transformational energy access is more problematic. Yet this is where access is most limited, and where increased access has the greatest potential for transformation. In such areas, a more viable option is access through mini-grids, that is, small self-contained generation and distribution systems, generally based wholly or partly on renewable technologies. Appropriately designed and operated mini-grids can, in principle, afford a cost-effective means of transformational energy access in remote rural areas, while non-electrical energy technologies can play an important role prior to electrification.<sup>2</sup> Mini-grids can also

pave the way for grid extension in other areas, as has taken place in China and India, provided they are designed to be interoperable.

## International dimensions

Achieving transformational energy access requires significant investments in electricity infrastructure, together with the transfer of energy-related technologies. Based on existing global estimates, the cost of universal access in the least developed countries may be in the order of \$12 billion–\$40 billion per year, and still greater for transformational energy access. Domestic resource constraints and limited interest among foreign investors in electricity infrastructure in the least developed countries mean that this cost needs to be financed primarily through official development assistance. Annual official development assistance to the energy sector in the least developed countries currently amounts to \$3 billion; fulfilment by developed countries of their existing commitment to provide assistance equivalent to 0.15–0.20 per cent of their gross national income could provide sufficient additional resources to fill the gap.<sup>3</sup>

In addition, the least developed countries currently depend mainly on imports, increasingly from other developing countries, for access to energy-related technology. Fulfilment by developed countries of their long-standing technology transfer obligations under the United Nations Framework Convention on Climate Change and the Agreement on Trade-Related Aspects of Intellectual Property Rights of the World Trade Organization could make a major contribution to providing access to the technology required by the least developed countries. The recently established Technology Bank for the Least Developed Countries could play a supportive role in this context, and UNCTAD could assist in the identification and resolution of the key bottlenecks to the effective transfer of energy-related technology.

<sup>2</sup> UNCTAD, 2017, Energizing rural development, Policy Brief No. 54.

<sup>3</sup> UNCTAD, 2017.

## Policy recommendations

At the national level, transformational energy access requires a systemic approach in the energy sector, exploiting the synergies and complementarities between technologies and energy sources in support of structural transformation. Effective long-term planning is essential, while maintaining flexibility to respond to rapidly evolving technologies and cost structures, as well as avoiding locking in technologies that may prove inappropriate as structural transformation proceeds. This requires a carefully planned and forward-looking approach to transformational energy access. The core of such an approach is a transparent plan for grid extension.

Clear strategic guidelines are also needed to ensure the early adoption of mutually compatible standards, so that mini-grids may be connected and/or interconnected with the grid as appropriate at a later stage.

Other key elements include a proactive

policy framework that supports and facilitates progressive technological upgrading, along with science, technology and innovation policies that foster the involvement of local research institutions in efforts towards adaptation and innovation in energy technology and their wider use.

The integration of strategies for increased energy access into overall development strategies is also critical, to match increasing energy supply with increasing demand, both geographically and over time. As well as reinforcing the contribution of wider energy access to structural transformation, this can help to reconcile affordability with financial viability in the electricity sector,<sup>4</sup> and accelerate progress towards universal access through the energy–transformation nexus.<sup>5</sup> In this regard, sectoral policies to promote the development of economic activities and the adoption of technologies appropriate to energy availability, as access and supply are increased, can play an important role.

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