



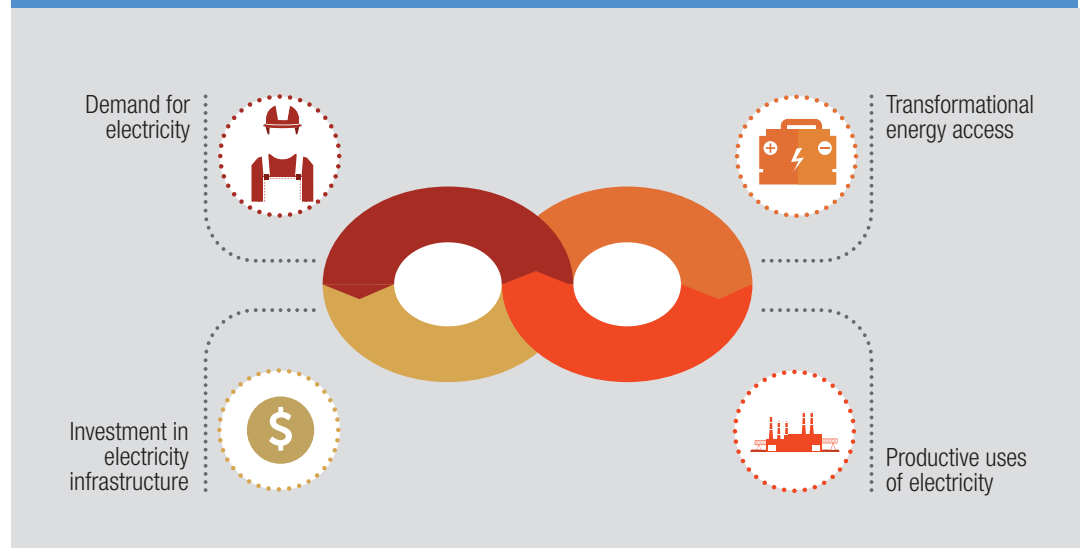
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POLICY BRIEF

THE ENERGY–TRANSFORMATION NEXUS

Access to electricity is essential to the structural transformation of the economies of the least developed countries. Equally, such a transformation is essential to electricity access. The viability of investments in electricity infrastructure depends critically on demand; and structural transformation directly generates demand in production processes and also strengthens domestic demand by raising household incomes. This two-way relationship – the energy–transformation nexus (figure 1) – is central to the development process, and essential to universal electricity access in the least developed countries.

Figure 1. The energy–transformation nexus



Source: 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).

Key points

Productive use of electricity can have a transformational impact on the economies of the least developed countries

The additional demand it generates can also help make investments in electricity infrastructure viable

The resulting energy–transformation nexus is central to both development and modern energy access

Harnessing this nexus effectively requires transformational energy access and complementary development policies

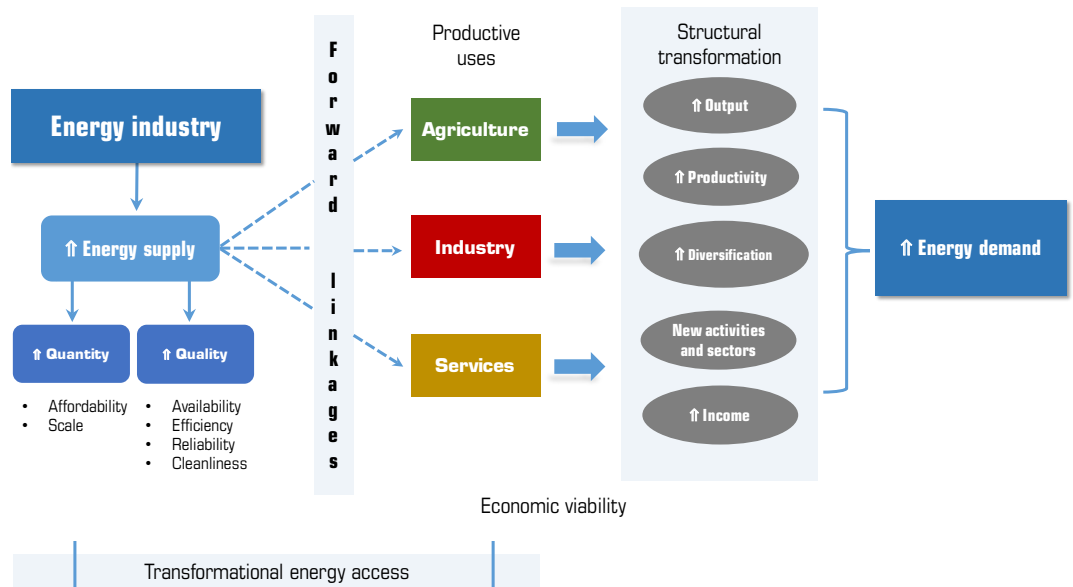
Productive use of energy

Structural transformation is central to development in the least developed countries. It entails a combination of increasing productivity within sectors and shifting productive resources from lower to higher productivity activities. Analysis presented in *The Least Developed Countries Report 2017* shows that there is an energy–transformation nexus in the least developed countries, whereby energy use both drives and is driven by the structural transformation of the

economy. The productive use of energy, and particularly of electricity, is central to this nexus (figure 2). It provides both the means by which access can transform the economy, and the additional demand that can strengthen the viability of investments in the electricity sector. Productive use is not merely additional to domestic use, but often complementary, as it helps smooth the time profile of electricity consumption; while the peak period for domestic use is in the evening, for lighting and entertainment, productive use occurs primarily during the day. Harnessing the



Figure 2. Transformational energy access



Source: UNCTAD, 2017.

energy–transformation nexus effectively to fulfil the economic potential of modern energy access thus requires moving beyond a goal of universal access based on minimal household needs, towards a goal of transformational energy access, to meet the needs of producers with regard to the nature, quantity, quality and affordability of energy supply.¹

However, there are limits to the productive use of electricity brought about by transformational energy access alone, because of other constraints on producers. Energy and development strategies therefore need to be closely coordinated. Insufficient demand for electricity will slow the development of modern energy systems, yet if energy demand for productive use remains unsatisfied, then the process of structural transformation may be slowed down or disrupted. Consequently, complementary industrial, enterprise and development policies are needed to promote increased demand for electricity for productive uses, to ensure that demand is sufficient to make the necessary investments in generation, transformation and distribution viable.

Integrating energy and development strategies

The key role of the energy–transformation nexus in sustainable development highlights the critical importance of fully integrating energy access plans with overall development strategies. Increasing access to modern energy can only be effective in promoting structural transformation in conjunction with an overall development strategy oriented towards this objective. Tackling supply-side constraints within a context of strong demand growth and investment dynamism is a key factor. Moreover, close coordination between energy and development strategies is essential, to match the evolution of energy supply and demand, both geographically and over time.

Policy recommendations to harness the energy–transformation nexus

Reaping the full benefits of the energy–transformation nexus also requires complementary policies to foster economic diversification and job creation.

¹ UNCTAD, 2017, Transformational energy access, Policy Brief No. 55.

The beneficial effects of modern energy access on development arise largely through a process known as creative destruction, as enterprises best placed to exploit and benefit from modern energy use displace those less able to do so, and as the supply of modern energy expands at the expense of the use of traditional biomass such as fuelwood and charcoal, which may be linked to important sources of employment. Maximizing the effects on structural transformation, in particular if progress towards poverty eradication is to be sustained, requires ensuring that new employment is created to replace the jobs that are lost in such enterprises and sectors. This involves, in particular, the following:

- Fostering the emergence of a domestic supply chain in modern energy and related products, such as the installation, operation and maintenance of solar equipment and self-powering solar devices, the processing and distribution of modern fuels for cooking and the production and marketing of improved stoves for domestic and productive uses;
- Providing vocational training and skills upgrading programmes in financial

literacy, business skills and the use of electrical equipment;

- Broadening access to credit and financial services, to facilitate technological upgrading and the adoption of electrical equipment among small and medium-sized enterprises;
- Ensuring the availability of other essential infrastructure for the productive sector, such as for water supply and transportation;
- Enabling science, technology and innovation policies to strengthen local absorptive capacities and innovation capabilities, including for the development, adaptation and dissemination of pre-electrification intermediate technologies for mechanical energy;
- Ensuring proactive interventions to address the constraints faced by women in accessing income, inputs, technology, credit and markets, to enable them to translate time reductions in domestic activities, such as fuel collection and cooking, from access to modern energy into economic empowerment, incomes and structural transformation.

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