

## More Than a Lightbulb

### Five Recommendations to Make Modern Energy Access Meaningful for People and Prosperity

#### Summary

- “Modern energy access” is finally on the international agenda, but the current common definition of 100 kilowatt-hours (kWh) per capita per year is far too low.
- To reflect likely demand and historical trends would require measuring energy usage at higher levels, such as 300 and 1,500 kWh per capita per year.
- Given that 70 percent of a nation’s energy is typically consumed outside the home, national development plans would benefit from country targets consistent with their industrial and commercial aspirations. Like income, per capita kilowatt-hour country categories could be useful benchmarks.
- The UN and other international bodies should adopt these new targets and definitions.

#### The problem

Energy is fundamental to modern life, but 1.3 billion people around the world live without access to “modern electricity.” But what does that mean exactly? The current definition is a mere 100 kWh per person per year for urban areas—or enough to power a single lightbulb for five hours per day and keep a mobile phone charged—and half as much in rural areas. Such a low bar can have profound implications for national targets, for international goals such as Sustainable Development Goal 7, and on a wide range of critical investment decisions with long-term effects on development.

#### Human and developmental implications

The harm to people living with little energy is very real. Indoor air pollution from burning biomass contributes to 3.5 million premature deaths per year, killing more people worldwide than AIDS and malaria

combined. Lack of power also does profound damage to education, the empowerment of women and girls, and many other development outcomes (see figure 1).

At a macroeconomic level, energy shortages are a massive drag on economic growth and job creation. Typically, some 70 percent of a nation’s energy is consumed for commercial or industrial purposes, not in the home, and data suggest that power shortages are among the very top constraints to private-sector growth.

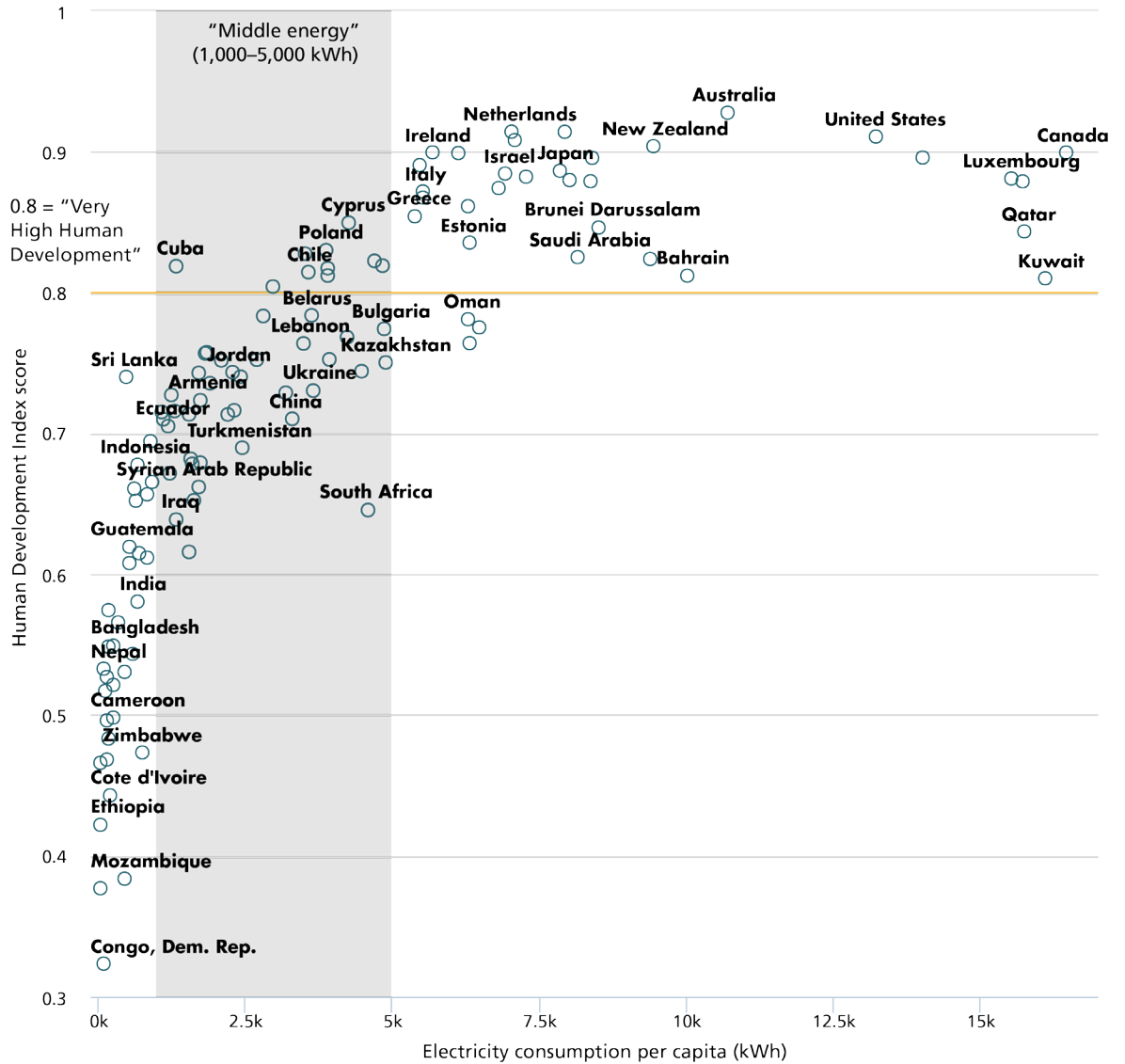
No high-income countries consume less than 5,000 kWh per capita per year (see figure 2).

#### Efforts underway

Aggressive electrification was an essential strategy to fight poverty and promote development in countries that are now rich, and it is now the same for the still-developing regions. Power is among the top priorities for governments and citizens alike. The international community is also on board,

**Figure 1. Higher Electricity Consumption Is Correlated with Higher Development and Human Welfare Indicators**

UNDP Human Development Index (2013); World Bank, World Development Index (2013).



with efforts such as the UN's Sustainable Energy for All, the US government's Power Africa, and many other similar initiatives. The UN's Sustainable Development Goal 7, for instance, is to "ensure access to affordable, reliable, sustainable, and modern energy for all."

The efforts underway, however, are not enough and pose at least two great risks:

1. They aim too low by measuring progress against a single, very low level of electricity consumption.
2. They focus too much on household usage at the expense of building a modern energy system that can compete in a global economy.

## Five Recommendations for Tracking Energy Access

Given the shortcomings of the current approach to defining and measuring modern energy access, we put forward the following five recommendations for the UN, International Energy Agency, World Bank, national governments, major donors, and other relevant organizations.

### 1. Maintain the existing energy access threshold but rename it, more appropriately, the "extreme energy poverty" line.

The current use of 100 kWh per capita per year remains valuable as an indicator for the initial rung on the energy ladder. But this level of energy consumption is consistent with only very basic lighting and phone charging. It is the notional equivalent of the extreme poverty line when measuring income, merely a bare minimum starting point rather than the finish line of development success.

**2. Measure and track household consumption at higher levels for "basic energy access" and "modern energy access."** Energy consumption should be measured at thresholds that balance the competing needs of being simple and aligning with energy demand and historical development patterns. The following two measurements should be added:

- *Basic energy access* at 300 kWh per capita per year, which would enable running basic appliances such as fans, televisions, and refrigerators, which families demand once they have modest additional income.
- *Modern energy access* at 1,500 kWh per capita per year, a level of consumption consistent with the label "modern" that includes on-demand usage of multiple modern appliances, including air conditioning.

### 3. Create energy-level categories to encourage ambitious national energy targets that go beyond household consumption.

Modern competitive economies require high levels of energy, the vast majority of which is consumed outside households in the commercial and industrial sectors. We propose the following categories (see also figure 2):

- *extreme low energy* (national average of less than 300 kWh per capita per year)
- *low energy* (300–1,000)
- *middle energy* (1,000–5,000)
- *high energy* (>5,000)

### 4. Adopt the new thresholds to inform progress-tracking and investment decisions.

The new household definitions and country categories could be used by the UN, the African Union, bilateral donors, the World Bank and regional development banks, the US government (for use in Power Africa monitoring and evaluation), and most especially by national governments.

### 5. Invest in data collection on energy consumption, utilizing new technology to improve collection.

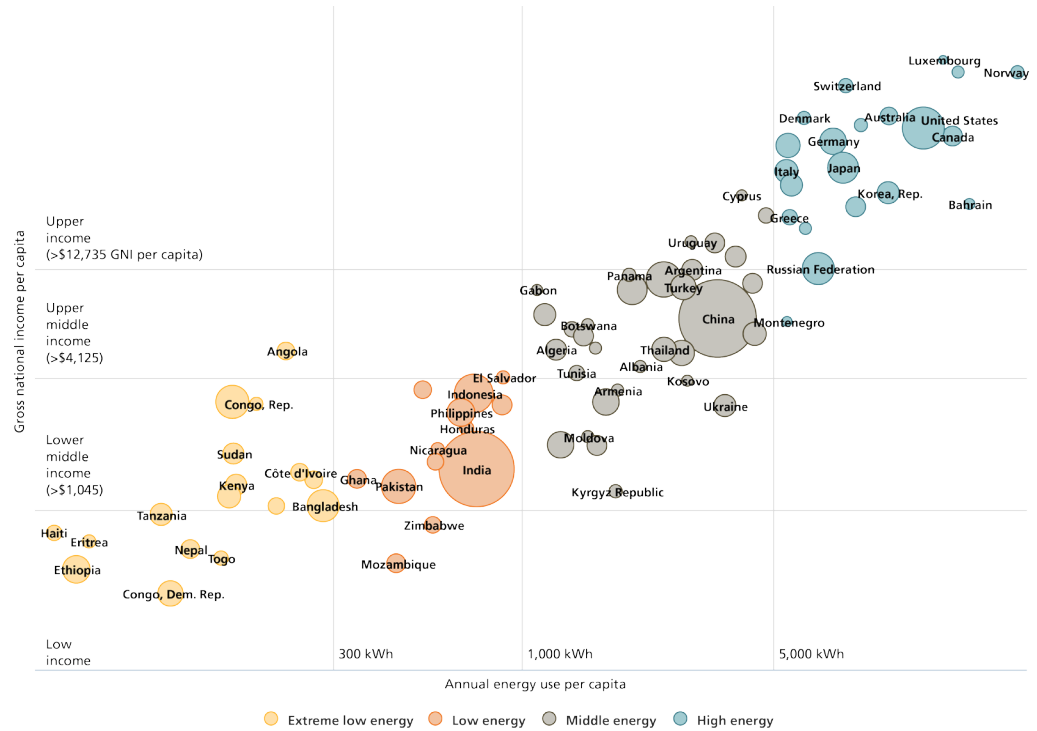
Additional higher-quality data would allow a better understanding of energy use, help identify gaps, and enable better targeting of new investments.

## Energy Access Targets Working Group

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## Figure 2. Energy Use Is Highly Correlated with a Country's Income Category

No rich country consumes less than 5,000 kWh/person/year. Size represents population. *Source: World Bank, World Development Indicators (2013).*



### About the Energy Access Targets Working Group

The Center for Global Development (CGD) convened the Energy Access Targets Working Group in response to the severe gaps in energy access, the growing global attention to the energy needs of the poor, and concern about the specific indicators being used to measure progress. The working group was in large part inspired by an essay by Morgan Bazilian and Roger Pielke Jr., "Making Energy Access Meaningful" (*Issues in Science and Technology*, 2013), which made a compelling case that current definitions were both inadequate and potentially problematic. The working group includes a diverse set of expertise and perspectives and each member was invited to participate in a strictly personal capacity, not as representatives of their employer or organizations. In keep with the spirit of CGD's working groups to be independent, rigorous, and, when necessary, bold, this report is not a consensus document, but rather reflects the discussions, debates, and input of the members.

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