



Development
Progress

Briefing Paper

01

Sustainable energy for all: a balance of objectives

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Key messages

- Energy plays a key role in economic growth and poverty reduction, and has been described as “the golden thread that weaves together the economy, the environment and equity”. Yet 1.4 billion people still have no access to electricity and 2.7 billion people lack clean and safe energy for cooking.
- There has been major progress in energy access in recent decades: between 1990 and 2008, around 2 billion people gained access to electricity. The expansion of the use of renewable energy and improvements in energy efficiency have been stronger in developing countries than in developed countries over this same period.
- Both industrialised and developing countries need to develop long-term low carbon development plans to deliver green growth and build lower-carbon energy systems. And an investment of just 3% more in modern energy services would meet the basic energy needs of around 33% of the world’s population.

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There is renewed interest in the relevance of energy to progress on development, stimulated largely by rising oil prices and the imperative to reduce greenhouse gas (GHG) emissions. This has created opportunities to highlight the critical role of energy in poverty reduction and bring it to the fore in development policy debates. In the words of the United Nations Secretary General Ban Ki-moon: “Energy is the golden thread that weaves together the economy, the environment and equity.”



This briefing paper summarises the state of the debate on progress in energy for sustainable development and outlines key challenges for policy in the future, particularly in relation to the three objectives of the United Nations Secretary General’s Sustainable Energy for All (SE4All) Initiative:

- ensuring universal access to modern energy services;
- doubling the rate of improvement in energy efficiency;
- doubling the share of renewable energy in the global mix.

Energy and development

There is a strong correlation between energy consumption and per capita GDP, the Human Development Index and other measures of development progress (GEA, 2012). While this relationship is influenced by improvements in energy efficiency and is weaker at higher levels of per capita energy consumption, increases in energy consumption are, for most people in the world, associated with increases in income and in wellbeing (Practical Action, 2010).

Energy is also linked to economic growth. There are different views on the full nature of this relationship (Stern and Cleveland, 2004; Ockwell, 2008), but some aspects are clear. Unreliable power supplies and a lack of energy constrain growth. Inadequate power supplies

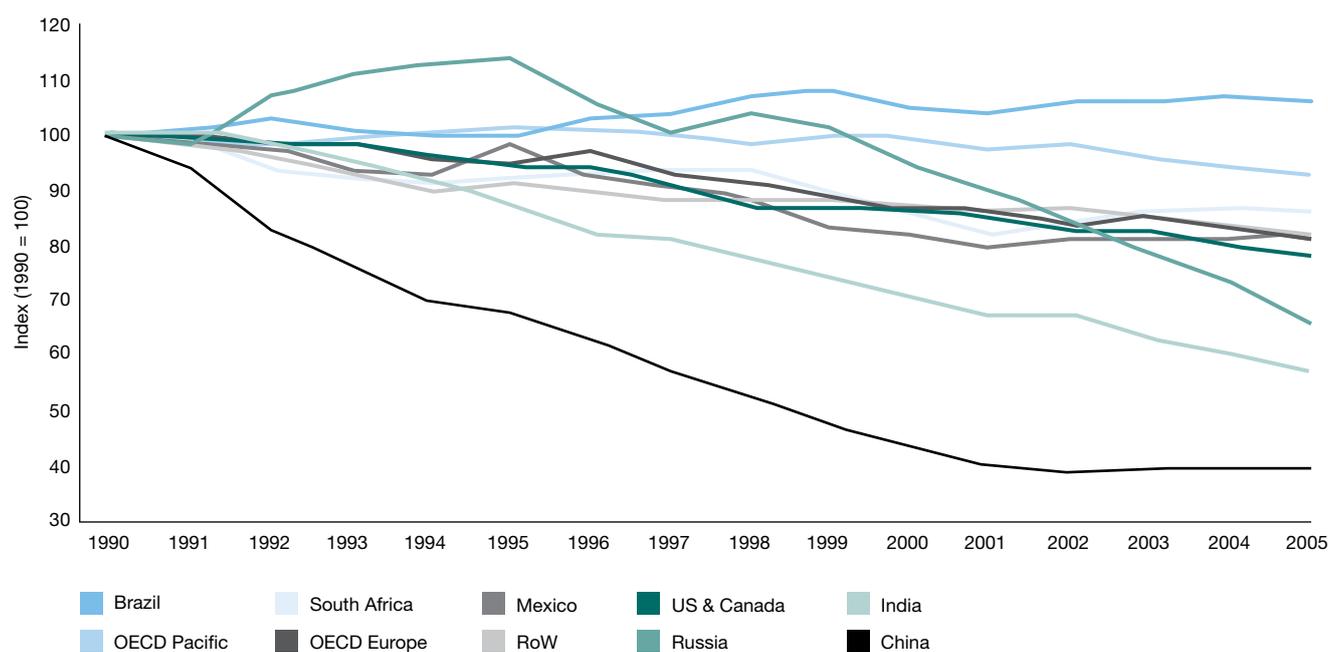
are estimated to have reduced growth rates in some West African countries by 0.25% a year (Ellis et al., forthcoming). The costs of back-up generators and lost output during power cuts in Africa amount to 1–4% of GDP (Foster and Briceño-Garmendia, 2010). Changes in oil prices also have an effect on growth in both oil importing and oil exporting countries (Kojima, 2011). Analysis by the Overseas Development Institute (ODI) has found that a one-third increase in oil prices over a two-year period would lead to a 1% reduction in GDP in sub-Saharan Africa, and as much as a 4% reduction in the poorest countries (te Velde, 2011).

Energy is a critical factor in poverty reduction, and access to modern energy (defined as electricity, safe and clean fuels, and mechanical power) is recognised as a prerequisite for the achievement of the Millennium Development Goals (Modi et al., 2005; AGECC, 2010).

Access to energy allows people to cook, heat and cool their homes, use telephones, radios and televisions, transport themselves and their goods, benefit from better health and education facilities, and earn a living. Access to modern energy for cooking improves energy efficiency, improves the health status of women and children by reducing their burden of collecting fuel and reducing indoor air pollution. Access to energy widens people’s livelihood options and strengthens their resilience in the face of climate change (Gaye, 2007).

Development progress, in these socio-economic terms, is clearly impossible without energy and investment in

Figure 1: Total final energy consumption per unit of GDP





energy services. But access to modern energy, especially electricity, can have a deeper significance. For many people, having an electricity supply is symbolic of their participation in the modern world and the opening up of their future opportunities.

However, energy from fossil fuels accounts for around two-thirds of global GHG emissions (IPCC, 2011) and, through its impact on climate variability and long-term climate change, this energy consumption threatens development progress and the lives and livelihoods of people in developing countries. Energy consumption is also a source of indoor and outdoor air pollution, which affects health and causes millions of premature deaths a year (Practical Action, 2010). Unsustainable consumption of woodfuel contributes to deforestation. We cannot, therefore, consider energy's contribution to development progress without taking into account its environmental and health costs and its overall effect upon sustainability.

Progress on energy

There has been a massive growth in both global GDP and energy consumption in the past two decades. Global GDP grew by over 100% between 1990 and 2010, with faster growth in some developing countries (World Development Indicators). Total final energy consumption increased by 23% globally between 1990 and 2005, with most of the growth in developing countries. The consumption of electricity (which accounted for 16% of total final energy consumption in 2005) increased by 54% during the

same period. The significant progress in energy intensity at the global level that this implies is shown in Figure 1. Per capita energy consumption increased in most countries and has been associated with rising incomes, with faster rates of increase in developing countries than in industrialised countries (IEA, 2008).

Between 1990 and 2008, around 2 billion people gained access to electricity, mainly through grid extension (GEA, 2012). The proportion of the population in Viet Nam with electricity access has increased from 5% in the 1970s to 98% today. In India, the proportion of the rural population with access to electricity increased from 56% to 75% in the space of just three years (2006–09) (IRENA, 2012). In Ghana, the access rate increased from 15% in 1990 to 72% in 2010 (Oteng-Adjei, 2012), while in South Africa 5.2 million people gained access between 1994 and 2010. Globally, GHG emissions from energy grew by 25% between 1990 and 2005 (IEA, 2008), and they have continued to increase.

There has also been progress on expanding the use of renewable energy in some countries. Global investment in renewables increased to \$211 billion in 2010, an increase of 32% on 2009, and more than half of this was invested in developing countries (BNEF, 2011). Renewables accounted for more than 25% of total global generation capacity by the end of 2011 (REN21, 2012). In low-income countries, renewable energy sources provide more than half of the total primary energy supply and a higher proportion of electricity than in industrialised countries. Increasingly, even under existing market conditions, renewable energy is starting to compete with fossil fuel



energy, both on-and off-grid, and in rural areas it is often the most viable option (REN21, 2012).

While there has clearly been some progress in line with the three objectives of SE4All over the past 20 years, progress has been uneven and there is still a long way to go on both energy access and the sustainability of energy consumption. Worldwide, 1.4 billion people have no access to electricity and 2.7 billion people do not have clean and safe energy for cooking. Unless policies change and additional action/measures are taken, there will still be 1 billion people in 2030 without access to electricity and the number without safe and clean energy for cooking will be the same as it is today (IEA, 2011).

The rate of improvement in energy efficiency in industrialised countries has been lower since 1990 than in the two preceding decades (IEA, 2008), but has been faster in developing countries (see Figure 1). There is scope for much of the future increase in demand for energy, and the reduction in greenhouse gas emissions, to be met through expected increases in the rate of energy efficiency.

Under existing policies and plans the share of renewables in the global energy mix is expected to increase to 18% by 2035 (IEA, 2011). According to analysis in UNEP's *Bridging the Emissions Gap* report (UNEP, 2011) a share of as much as 24% by 2020 may be necessary to meet internationally agreed climate change objectives. Other estimates suggest that more than 40% of the world's energy will have to be renewable to hold global warming to a rise of no more than 2°C and avoid irreversible climate change (PBL, 2012).

Policy challenges

The deliberate combination of the SE4All objectives seeks to address the inter-related challenges of lack of access to modern energy services and the reduction of GHG emissions from energy use. Increases in energy efficiency and in the share of renewable energy also contribute to energy security, which has been central to national energy policy in many countries. Achieving sustainable energy for all will be determined by the implementation of policies and strategies across these key inter-related areas of concern for energy policy.

The policy focus on energy security is the result of rising oil prices, as a result of growing demand in emerging economies and the higher costs of production, coupled with a sense of increased risks to supply as a greater proportion of energy supplies is traded across national boundaries and political insecurity affects major oil exporters. This energy security concern is driven by national strategic interests that aim to maintain economic growth by ensuring that existing consumers, including industry and relatively well-off households, have a continued and more reliable supply.

Alongside higher oil prices, a diversification of energy sources to strengthen energy security is driving more investment in lower carbon and renewable energy supplies. However, fossil fuels still dominate the energy mix both globally and in many countries. The practical challenges of substitutions between oil, gas and coal, and between fossil fuels and renewables, coupled with the lifespan of many energy investments have generated debate about lock-in to

a high carbon future through continued investment in high carbon energy projects. This has resulted in continuing concern about energy-related GHG emissions and the sustainability of energy consumption.

One way to resolve this question would be for both industrialised and developing countries to develop long-term low carbon development plans to deliver green growth and build lower-carbon energy systems, in line with the SE4All objectives.

Unlike many existing national energy strategies, these plans could include a specific energy access objective, and be integrated into national climate change strategies (Kozulj, 2010; Practical Action, 2012; UNDP, 2007). Such plans could exploit the considerable potential that exists in developing countries to reduce energy consumption and emissions through investment in efficiency (Dobbs et al., 2011; UNIDO, 2011). Analysis by the Global Energy Assessment and others (GEA, 2012; IEA, 2011; Dobbs et al., 2011) indicate that it is technically feasible to achieve the objective of sustainable energy through investment in energy efficiency and renewables.

Universal access to modern energy services is also a possibility. An estimated investment of \$48 billion a year would deliver universal access to a basic level of modern energy services by 2030 (IEA, 2011). This is more than five times higher than the \$ 9.1 billion invested in energy access in 2010, but it is equivalent to only 3% of the total invested in energy worldwide every year. In other words, 3% more would meet the basic energy needs of around 33% of the world's population.

Achieving universal access and doubling the share of renewables by 2030 demands a radical departure from 'business as usual' pathways. The SE4All Initiative seeks to stimulate greater levels of investment in energy access and clean energy through voluntary commitments, including (developing country) national energy strategies and plans. Though a number of substantial commitments were made during the Rio +20 conference, SE4All faces a number of challenges if it is to realise the scale of investment required to achieve radical change and the expected progress towards sustainable energy for all by 2030.

The first challenge is the extent to which commitments by governments, international organisations and private sector stakeholders to SE4All will entail resources that are additional to business as usual. Roughly one third of the commitments are for energy access in developing countries, and of the remainder a significant number are primarily about increasing energy efficiency or renewable energy within businesses that operate worldwide. Lack of consensus on the definition of 'energy access', 'sustainable energy' and 'energy efficiency' does little to boost transparency about the new commitments made under the label of SE4All.

A second challenge is how the SE4All initiative and its Agenda for Action are going to be overseen, promoted and

monitored. Even with voluntary commitments, some form of mechanism is needed to review progress towards the three objectives. The World Bank will work with others to produce a baseline for SE4All, but the responsibilities and mechanisms for reviewing and monitoring commitments, and how they will involve different stakeholders, are not yet clear.

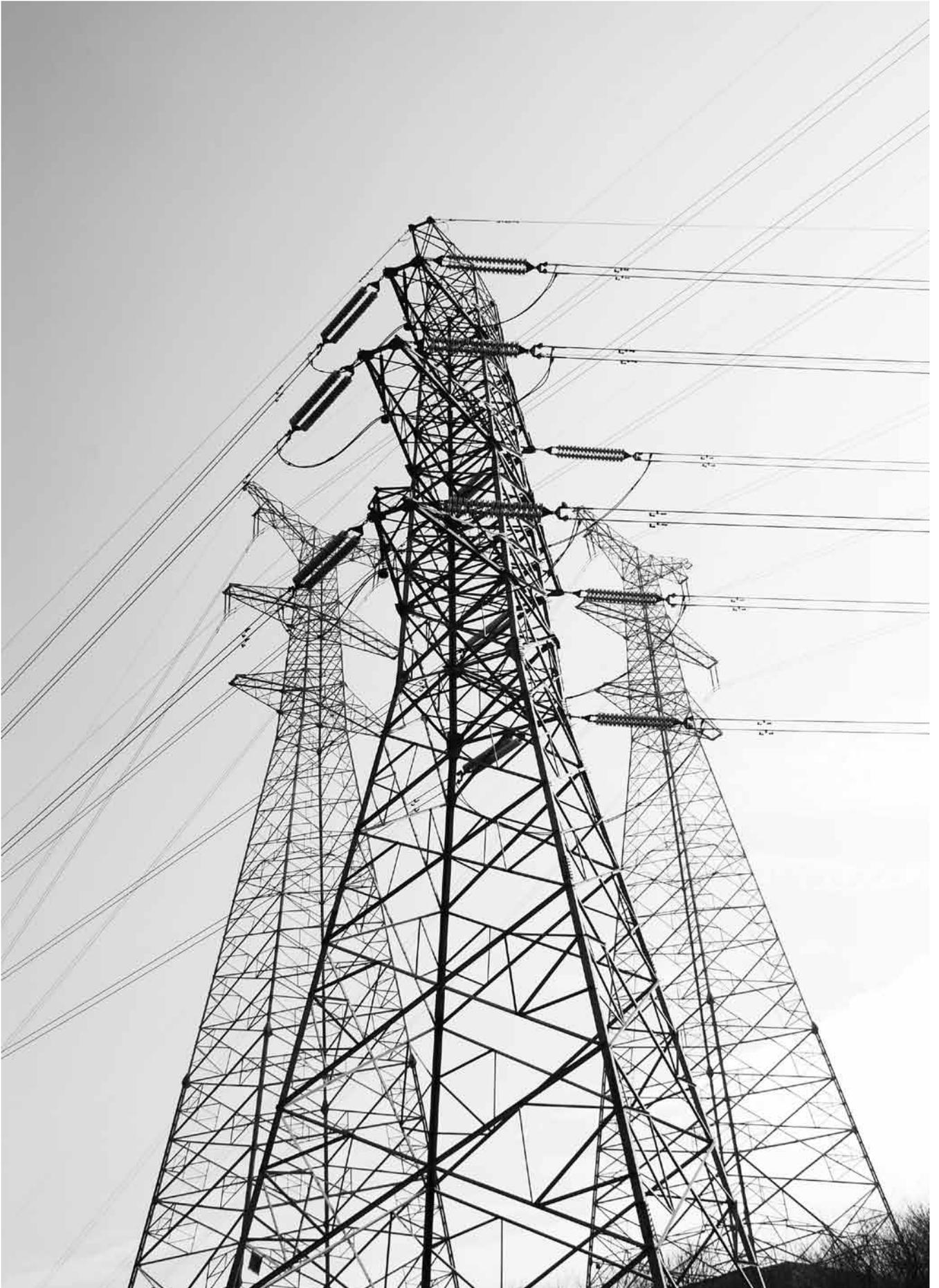
Policy recommendations

The achievement of sustainable energy for all requires governments to balance their policy prescriptions and their actions between the three different objectives of ensuring secure and affordable energy supplies for consumers and economic growth, meeting commitments to reduce greenhouse gas emissions, and ensuring equitable access to modern energy services. How this is pursued will vary from country to country, but there are two important common elements.

- **Development and implementation of national energy strategies** not only to deliver energy services for growth and poverty reduction, but also strategies for the long-term transition to a sustainable, lower-carbon energy mix. Central to these strategies will be pathways for investment in a low-carbon power sector.
- **Clear objectives for access to modern energy services and for renewable energy and energy efficiency.** Many countries have targets for one of the SE4All objectives, but few have targets for all three that are based on an explicit assessment of the balance between them. While many investments will contribute both to increasing access rates and reducing greenhouse gas emissions, it cannot be assumed that this will always be the case and progress on the two objectives must be assessed specifically and separately.

Multilateral development banks and donor countries must provide sustained support to developing country governments that enables them to establish policy frameworks, to build national capacities to develop and deliver energy services, and to ensure equitable access to energy services. The Sustainable Energy for All Initiative provides a framework for this, but for it to be effective as a global initiative it will require common metrics for access and sustainability, and sustained international leadership to maintain the interest and commitment achieved over the past year.

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