

ECONOMIC STUDIES

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Promoting energy efficiency in the developing world

Developing economies have a huge opportunity to strengthen their economic prospects by boosting their energy productivity.

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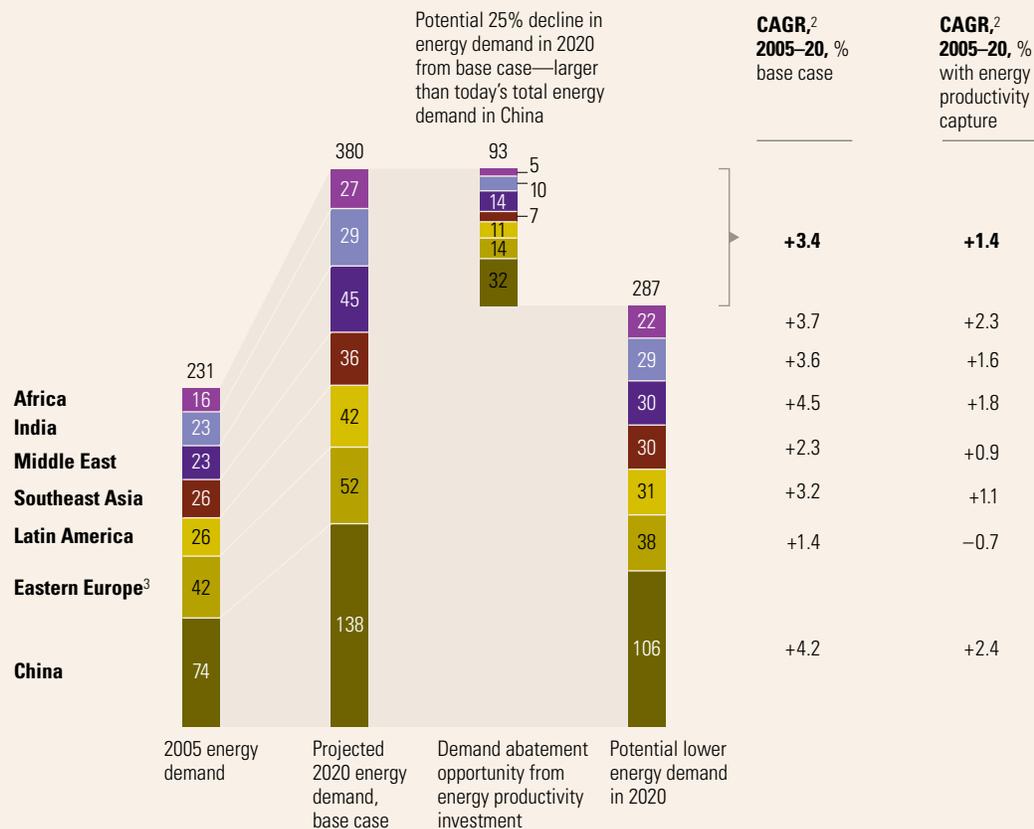
Big gains await developing countries if they raise their energy productivity, research by the McKinsey Global Institute (MGI) has found: they could slow the growth of their energy demand by more than half over the next 12 years—to 1.4 percent a year, from 3.4—which would leave demand some 25 percent lower in 2020 than it would otherwise have been (Exhibit 1). That is a reduction larger than total energy consumption in China today.

Policy makers and businesses in developing regions must not be deterred from boosting energy productivity (the output they achieve from the energy they consume) because of the present weakening economic environment and falling oil prices; these do not affect the long-term projections in the study.¹ Time is of the essence: developing economies will install half or more of the capital stock that will be in place in 2020 between now and then. Every building or industrial plant constructed without optimal energy efficiency represents a lost opportunity to lock in lower energy consumption for decades.

¹The study—conducted before the economic slowdown in late 2008—assumes, among other things, global GDP growth of 3.2 percent annually to 2020 (including, for example, 6.4 percent annual growth in China) and an average oil price of \$50 a barrel. A fresh review of the data and underlying assumptions indicates that slowing worldwide economic growth in the near term will have minimal effects on the long-term projections in this article.

Exhibit 1 Higher energy productivity

End-use energy demand by region,¹ quadrillion British thermal units (QBTUs)



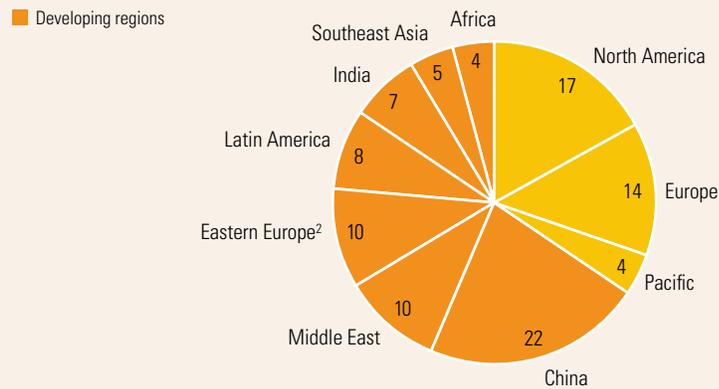
¹Figures may not sum to totals, because of rounding.

²Compound annual growth rate.

³Includes Belarus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Russia, and Slovakia.

Exhibit 2
**Where the
 opportunities
 are**

End-use energy demand abatement in 2020 by region,¹ %
 100% = 143 quadrillion British thermal units (QBTUs)



¹Figures do not sum to 100%, because of rounding.

²Includes Belarus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Russia, and Slovakia.

Source: McKinsey Global Institute analysis

Just by using existing technologies that would pay for themselves in future energy savings, consumers and businesses could save some \$600 billion a year by 2020. Companies that pioneer energy efficiency in their home markets will be well placed to carve out a leading position in the global market for “green” products and services before it matures. Indeed, 65 percent of available positive-return opportunities to boost energy productivity are located in developing regions (Exhibit 2).

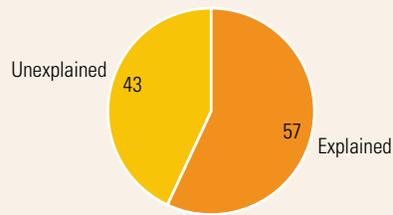
The benefits of higher energy efficiency are achievable with an investment of \$90 billion annually over the next 12 years—only about half of what these economies would otherwise need to spend on their energy supply infrastructure to keep pace with higher consumption. Indeed, because of lower labor costs, the price tag for investing in energy productivity is on average 35 percent lower in developing economies than in advanced ones.

At present, a range of market failures and information barriers discourage developing countries from increasing their energy productivity, even with high energy prices. Capital constraints, particularly for low-income households, are a major hurdle. Consumers also tend to lack the information they need to make the right choices. Many companies, insulated from the true price of energy, have relatively little incentive to identify and invest in the fragmented energy savings opportunities that are available. And today’s tighter credit markets are squeezing the financing of all investments—even less risky ones, such as those in energy efficiency.

MGI calculates that somewhat more than half of the current variation in energy productivity among developing countries can be explained by climate, industry structure, and energy policies (Exhibit 3). Climatic extremes that require the use of heating and cooling systems unavoidably increase energy consumption in relation to GDP in some regions. Heavy industrialization is a consideration because countries with large manufacturing sectors tend

Exhibit 3
**Variation in
 energy
 productivity**

**Variation in energy productivity among
 developing countries,¹ 2005, %**



**Type of contribution to variation in energy
 productivity,² %**



¹Data covers 27 developing countries (defined as those with a 2007 average per capita income of less than \$11,000, adjusted for purchasing-power parity).

²Climate is based on hot/cold days; industrial structure reflects the manufacturing and nonmanufacturing subsectors of the economy, combined with level of per capita income; policies include gas subsidies and gas taxes, as well as an index of corruption.

Source: Global Insight; International Energy Agency (IEA); national sources; McKinsey Global Institute analysis

to consume more energy and have lower energy productivity. But for energy policy, there are adjustments that developing countries can make. MGI identifies four priority areas.

The first is to reduce energy subsidies, as they tend to lower energy productivity. The International Energy Agency (IEA) estimates that in 2005, these subsidies totaled more than \$250 billion a year in developing countries—more than the annual investment needed to build their electricity supply infrastructure. Protecting the poor from the stress of high energy prices is a legitimate goal. But there are other ways to achieve this and similar welfare goals at a lower cost. For example, in Latin America and elsewhere, governments have tried to reduce poverty by using conditional cash-transfer programs, which can also help compensate low-income households for high energy costs. To ease the transition to more efficient energy use, governments should consider providing finance for upgrades to more efficient equipment and use some of the savings from lower energy consumption to assist poor segments of the population.

Second, governments should provide incentives for utilities to improve energy efficiency and encourage their customers to do the same. Policy options include revenue incentives and certification programs that measure and reward progress toward achieving efficiency targets and also encourage the adoption of technologies such as smart metering that help households better manage their energy use.

Implementing and enforcing energy efficiency standards is a third area for action. Such standards boost production of more efficient appliances and equipment and reduce their cost. Indonesia has recently adopted the UN technical regulation on auto energy efficiency, for example, and Ghana has pioneered standards for household appliances in Africa.

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A fourth priority is encouraging public–private partnerships, such as collaborations between governments, energy service companies, utilities, and mortgage companies, to finance higher energy efficiency in buildings. China, which manufactures 70 percent of the world’s lightbulbs, now has very large subsidies in place to promote the uptake of energy-efficient bulbs.

If developing countries and their businesses seize the initiative on energy productivity, they will cut their energy costs, insulate themselves from future energy shocks, and secure a more sustainable development path—benefits that are all the more desirable given the current global financial turmoil. *Q*

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