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Energy efficiency for a sustainable future

Many companies work continuously to improve existing processes and products to reduce environmental pressures, while at the same time achieving a competitive advantage. However, energy efficiency has to be considered broadly, targeting production, distribution, but also the range of consumers, including industry, transport and private households. Improving energy efficiency is a complex challenge, which involves, among others, taking a close look at the use of energy sources and technologies, waste generation, transport, requirements in the area of heating, lighting and others. Continued research and development as well as education about energy efficient behaviour are crucial to make real progress happen. BIAC values IEA work in this area and is pleased to present its views on energy efficiency for a sustainable future.

Introduction

Securing an economical, reliable, and environmentally-friendly energy supply is one of the top priorities of international and national policies nowadays, while energy efficiency continues to be a critical component of any comprehensive sustainable energy strategy. As the IEA puts it, our actual global energy situation is vulnerable and expensive. According to the reference scenario or the IEA's World Energy Outlook 2006, global primary energy demand is projected to grow by just over one-half between now and 2030, an average annual rate of 1.6%¹, while global energy-related carbon-dioxide emissions are expected to increase 1.7% per year². The threat of climate change, the erosion of energy security and the growing energy needs of the developing world all pose major challenges for energy decision makers.

These challenges can only be met through innovation, adoption of environmentally friendly cost-effective technologies, and a better use of existing energy-efficient technologies as well as changed consumer behavior. It will take a huge and coordinated international effort to achieve results. The IEA is working on the issue in the frame of the Gleneagles Plan of Action, and its Climate Technology Initiative (CTI) aims at fostering international co-operation in the accelerated development and diffusion of climate-friendly and environmentally sound technologies and practices in partnership with developing and transition countries and other international bodies.

Improving energy efficiency is often the fastest way to meet the world's energy needs. According to the IEA World Energy Outlook 2006, policies that encourage the more efficient production and use of energy contribute to almost 80% of the CO₂ emissions avoided³. Energy efficiency gains are a first priority for a more sustainable energy future.

¹ WEO 2006, p. 37, par. 3

² WEO 2006, p. 41, par. 1

³ WEO 2006, p. 42, par. 4

Energy efficiency is important for all

Optimizing energy efficiency is an issue for all parts of society and every nation and should be considered broadly. Efforts to accelerate progress in energy efficiency should target production and distribution as well as the range of consumers, including industry, transport and private households.

Energy efficiency for consumers

Changes in consumer behaviour offer an immediate solution, and much needs to be done to raise the general awareness among the population of the benefits of improved energy efficiency. There is still significant scope for adopting more efficient technologies in buildings, industry and transport, heating, lighting, waste generation and others, and improved consumer behavior will account for these changes.

Energy efficiency for producers

Many companies work continuously to improve existing processes and products to reduce environmental pressures and use resources more efficiently. The private sector is the major source of capital, innovation and technology as well as of investments that can transform the global energy system. As energy products and services are delivered essentially by industry, the business community has a central role to play in the discussions related to energy efficiency.

Energy efficiency globally

Energy efficiency is a global issue requiring global action; it has an important role to play both in developed and developing countries. In developing countries, the potential for improvement is even greater, as rapidly expanding economies offer enormous opportunities for investment in energy-efficient technologies. The right mechanisms are essential to ensure that this potential is seized and the numerous benefits of energy efficiency are realized.

Challenges for implementation

Long term investment decisions that will impact the issue of energy efficiency for the coming decades need to be taken now, but there are still major barriers to overcome.

1. Educate

Energy efficiency is a broad concept that involves addressing a wide range of issues. To begin with, we should learn to pay attention to such basic things in our every day life such as switching to efficient light bulbs or keeping tyres correctly inflated that can make a surprisingly significant difference. For instance, roughly 20% of motor vehicle's fuel consumption is used to overcome rolling resistance of the tyres. According to the IEA the rolling resistance of tyres can be cut by as much as 50%, leading to a 10% reduction in fuel use, thus the savings from tyres with low rolling resistance for Europe alone could exceed 20 million tones of CO₂ per year by 2020. Savings from proper inflation could double these savings⁴.

⁴ Paper on a proposal for energy efficiency actions by IEA countries, IEA Standing Group on Long-term Co-operation, p.5-6, par 18, 22

Actually, few people are concerned with energy efficiency when buying appliances, homes or cars. End-users and market actors are often unaware of the savings potentials and quality advantages of the new energy efficient devices and without information are inclined to use the technologies that they have always used. Education and awareness raising will have an increasingly important role to play.

2. Implement current technologies

The development and global utilization of already existing cost-effective technologies will be crucial to improve energy access and promote energy efficiency. Some of the new higher-efficiency technologies in buildings, industry and transport that can contribute to this transformation have not yet been commercialized and we continue to use less efficient and sometimes even more expensive technologies.

There is plenty of scope for action. For instance, the IEA estimates that in many industrialized countries, new buildings could be made 70% more efficient than existing buildings⁵. As another example, were end-users to install only efficient lamps, ballasts and controls that will save them money over the life cycle of the lighting service, it would result in staggering cumulative savings of almost 28 000 TWh of final electricity before year 2030 and over 16 000 Mt of CO₂ emissions would be made beyond what is expected with the continuation of current policies⁶.

Such analysis is also important in developing countries, experiencing extensive new construction, and could be particularly useful for Southern and Central European countries. The excellent work carried out by IEA leads us to conclude that simply by making better use of today's efficient technologies and techniques, we could avoid enormous sources of waste.

3. Encourage energy efficiency in developing countries

Over 70% of new energy demand in the next 25 years will come from developing countries, a third of that from China⁷, but economic activity in developed countries will also remain a major source of emissions. For rapidly growing economies, the right investments in production processes and using the best possible technology available have the potential to achieve major energy savings and ensure that environmental effects do not increase at the same pace as economic growth. For instance, China, which is the second-largest emitter of the greenhouse gases and is predicted to rise to the top spot, gets nearly 70 percent of its energy from coal-fired power plants; many of them equipped with substantial pollution controls⁸.

The IEA estimates that the average thermal efficiencies on the Chinese coal plants are 28%, compared to around 38% in OECD countries. Some 300 million tons of coal could be saved by raising the efficiency of boilers and other coal fired plants by 30-35% and potential savings up to

⁵ Energy Technology Perspectives –Scenarios&Strategies (IEA), p. 37, par. 4

⁶ Light's Labour's Lost – Policies for energy-efficient Lighting (IEA), p. 27, par. 2

⁷ OECD Observer, No. 258/259, December 2006, p. 3, par. 4

⁸ International Herald Tribune, Wednesday, February 7/2007, p. 8

400 million tones could be achieved⁹. Along with India, China is exempt from the requirements of the Kyoto protocol claiming that to transform the energy structure and to use clean energy would need a lot of money. In view of critical importance to protect the global environment, more needs to be done to drive technology transfer in developing countries.

Initial areas to target are coal mining, coal washing and the more efficient design of boilers and environmental equipment for new power plants. These steps could deliver reduction in pollution and emissions levels, better water and land management practice, safer and more efficient coal mines, more efficient use of the transport and distribution system by energy products, higher thermal efficiencies in power stations and ultimately cheaper and more reliable power.

Governments can facilitate and create the policy frameworks, which encourage the private sector to engage in technology cooperation – to work with their partners in developing countries to invest in clean energy and efficient technologies.

4. Encourage innovation in technology

Technology will affect the choice and costs of future energy systems. Investment in R&D is needed now to provide energy efficient technologies in the medium- and long-term. While the private sector remains the main vehicle for technology diffusion through its day-to-day business of technology development, investment, commercialization and dissemination, governments have an important role to play. They have an important role in providing an R&D friendly environment and offering high-quality intellectual property right protections to encourage investment by the private sector in R&D; encouraging technological development and deployment by supporting research centres and universities involved in R&D on long-term energy and energy efficient policies; engaging in a dialogue with major groups on the advancement of new technologies and anticipating the legal and regulatory framework for emerging new technologies, such as carbon capture and storage.

Policies promoting the development of energy efficient technologies may also include simplifying red tape for planning and permitting, like for big hydro and nuclear; product standards for appliances and building codes; subsidies for fast market penetration of renewable energy and how to get these to scale and thereby reduce costs for these technologies; sharing of R&D costs between governments and business for new technologies like carbon capture and storage or next generation of nuclear; risk guarantees for these new major technologies. Governments should keep all energy options open and avoid choosing “winners” and “losers” among technologies, at the same time considering investment requirements for the range of options in the energy mix. Investments are driven by expectations of future returns which will depend on future market conditions, so providing innovation-friendly markets for companies should become one of governments’ main objectives, for lack of these frameworks constitutes a major barrier to investment in research and development and stifles innovation.

Industry and energy efficiency

Market-led approach to low carbon technologies

Energy efficiency can play a major role in helping to address the problem of climate change. At the same time it is essential that the right balance is struck between creating an effective political and regulatory framework and allowing the market to deliver. Climate policy uncertainty does weaken the investment incentives for low-carbon technologies. Uncertainty could also lead to such investment choices as, for example, favoring extension of existing plant rather than

⁹ Coal in the energy supply in China, Report of the CIAB Asia Committee (IEA), p. 25, par. 7

investing in new plant, leading to modest increases in electricity prices, and possibly creating investment cycles which could exacerbate short-term peaks and troughs in generation capacity. Industry needs the right framework to promote low-carbon technologies – that should be market-led rather than having specific measures imposed by politicians.

The challenges to the competitiveness of energy intensive industries are to be considered when trying to introduce any unilateral measures aimed at achieving low-carbon economy. For instance, an increase in tax on steelmaking or car industry would therefore cause a switch of steel or automobile production to countries where energy efficiencies are lower, resulting in an increase in global CO₂ emissions. It should be borne in mind that energy efficiency in most industries is much higher in OECD countries than in many developing countries, such as China and India. The introduction of extensive carbon tax targets would only accelerate the switch of production to parts of the world with poorer energy efficiency, which would result in an increase in global CO₂ emissions. Any extensive industrial policy interventions, e. g. emissions reductions, may burden the industries that would otherwise contribute most to the development and further broad deployment of energy efficient technologies.

Enabling frameworks for investment in innovation

Business plays an important role in energy efficiency, within its sphere of responsibility, in partnership with other stakeholders. It should be taken into account that business operates well under sound, and predictable long term enabling frameworks and good governance. Governments should play an essential role in creating a framework that enhances the ability of business to make optimal contributions to improving energy efficiency. Enabling frameworks, taking into account economic, environmental and social implications, are critical to the success of both governmental policy and to motivate and support private sector contribution to energy efficiency and innovation in technology resulting in sustainable future. Countries need to provide innovation-friendly markets for their companies, the lack of which constitutes a major barrier to investment in research and development and stifles innovation. Governments should ensure the development and deployment of leading-edge technologies through partnerships and incentives and an approach to mitigate long-term market risk and deliver secure benefits for large scale, low-carbon and efficient new technology projects. These conditions when provided by governments will attract and support business investments and innovations in the energy sector.

Incentives

Business role in society is the efficient provision of goods and services that people want, satisfying these demands in a way that minimizes resource use and pollution, but very often manufacturers have little incentive to offer low power products because they receive little recognition or benefit for any extra effort on investment. Where energy efficiency improvements require greater investment or consideration of feasibility, funding may be available from such sources as grants, interest free loans or tax incentives for businesses that invest in energy saving equipment.

Many appliances are manufactured by multinational companies and are traded internationally, which provides consumers access to the best goods, while providing manufacturers access to a wider market. Unfortunately, regional and/or national differences in the performance standards of products hinder free trade and increase costs to consumers. As a result, international harmonization and co-ordination of specifications will be necessary to reduce costs to manufacturers and continue the growth of new markets for efficient products.

Partnership

In the end, it is the private sector that will have to deliver the changes required. But the market on its own will not always achieve the desired results. Governments have a major role to play in supporting the development and deployment of energy efficient technologies and surmounting some daunting barriers. In this respect, partnerships and global cooperation will play a particularly important role. Business supports partnerships as a very practical means of contributing to improvement of energy efficiency and of delivering sustainable development. For instance, innovation systems and human resources for science and technology accounting for better energy efficiency can be achieved through promotion of better public-private partnerships, in particular of the industry-university relations.

No part of society can address energy efficiency and sustainable development challenges in isolation. While business does not see partnerships as a substitute for government commitments or requirements, they are a powerful means for business and industry to contribute to sustainable development objectives where there is a sound business case and the potential to deliver benefits for all partners involved. Increased communication with the financial community would also be helpful. Government, industry and consumers will have to work hard together to improve energy efficiency.