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The findings of the Global Energy Assessment provide cause for optimism ahead of COP17, believes Professor Nebojsa Nakicenovic, Deputy Director of IIASA...

Achieving access to modern energy services was the central theme of the Vienna Energy Forum hosted by the United Nations Industrial Development Organization (UNIDO), the Austrian Federal Ministry for European and International Affairs, and the International Institute for Applied Systems Analysis (IIASA) in June 2011. The event brought together 1,200 participants from 125 countries representing policymakers, civil servants, scientists, energy experts, and NGOs.

The goals of the forum, as endorsed by the participants and stated by the United Nations Secretary General Ban Ki-moon, are to achieve by 2030:

- Universal access to modern energy;
- Reduction of energy intensity by 40%;
- Increase of the renewables share to 30%.

The forum was timed to enable organisations with pivotal roles in addressing global energy issues to assess progress, and define a clear roadmap for turning ideas into action ahead of the key international, and closely aligned, events: specifically the United Nations Conference on Sustainable Development (Rio+20) to be held in May 2012 and the UN Framework Convention on Climate Change Conference of the Parties meeting (COP17) commencing in Durban on

28th November. The forum also coincided with the pre-launch of the Global Energy Assessment (GEA), one of the most comprehensive and integrated assessments ever undertaken of the global energy system. The GEA provides a science-based rationale for how governments and communities can address energy security issues and the urgent and growing 'energy gap' that exists between the developed and the developing world.

The human and environmental imperatives for closing this energy gap – one so profound that it locks billions of people into systemic poverty – are many: from reducing the severe impacts on human health, improving gender equity, and enhancing economic development, to achieving environmental sustainability, which is enshrined at a global scale in the urgent need to mitigate serious climate change.

Associated with these imperatives is that of personal freedom – a dimension encapsulated in the forum's closing statement by UNIDO Director General and Chair of the UN Secretary General's Advisory Group on Energy and Climate Change, Kandeh Yumkella, who stated: "...energy systems bring freedom – freedom for individuals to have information...to be creative...to have light. This is not about political freedom but individual freedom."



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Kandeh Yumkella, Director General of the United Nations Industrial Development Organization (UNIDO) and Chairman of the Advisory Group of the Secretary-General on Energy and Climate Change (AGECC), attends the launch of the GEA's report, *Towards a Sustainable Global Energy Future*.

Embodying in this freedom we can add the ability to cook a meal without inhaling toxic fumes, or the ability to attend school or to be employed instead of spending hours each day collecting wood for cooking and lighting. The realisation of these opportunities – that those living in the developed world take for granted – must become options for nearly three billion people who currently lack access to modern energy. Current energy systems are also directly responsible for around three million premature deaths annually through ill health.

While acknowledging that these goals are aspirational and ambitious, they are nonetheless achievable. Achieving them, however, requires transformational change in the way communities and governments think about, and use, energy services, and the acknowledgement that decarbonising energy systems must be a priority. The GEA (to be published in November 2011) is a five year undertaking involving 500 of the world's leading energy analysts, which offers specific guidance on how the goals mentioned here can be achieved, and at what cost. Using a highly integrative, holistic approach, the assessment has analysed all aspects of the energy system and incorporated the co-benefits of various options into the analysis. The findings suggest we can be optimistic about our ability to achieve the energy goals as defined by the United Nations and the Vienna Energy Forum.

Universal access to modern energy

The GEA concludes that universal access to electricity and clean cooking can be achieved by 2030, with investments of approximately US\$40bn per year. While seemingly high, this figure represents only about 3% of current energy investments or 8% of energy subsidies, and thus financing it would appear to be possible with appropriate institutional frameworks and incentive structures. This investment would bring significant co-benefits by largely eliminating indoor air pollution, including the high burden of black carbon emissions that are so harmful to human health and the environment.

Reduction of energy intensity by 40%

This goal is essentially about improving energy efficiency. The GEA scenarios show that energy-efficiency improvements are the most important option in the

transformation toward more sustainable energy futures. They require upfront investments and integrated, inter-sectoral approaches to realise efficiency potentials. In the building sector, for example, energy for heating and cooling can be cost-effectively reduced by up to 90% of current use. Furthermore, present and foreseen technologies can reduce energy consumption of new appliances, IT and other equipment in buildings by up to 65% of current use by 2020. Efficiencies in this sector are significant as buildings, from construction through to demolition, account for 40% of global energy demand, and are responsible for one-third of energy related CO₂ emissions. As the building sector is one of the highest users of energy globally, such spectacular growth in efficiency could have a major impact on energy demand and supply. Similarly, in the transport sector, major gains can be achieved through the broader use of alternative fuels such as electricity, hydrogen and biofuels, as well as through better transport infrastructure, but most importantly through a shift from individual to collective transportation modes.

Increase of the renewables share

This goal corresponds to a doubling of the current 15% share of renewables. The potential of renewable energy sources is immense, given their wide availability; however, significant technological investments and upscaling are required to achieve this potential. Renewables improve resilience and energy security through less dependency on foreign oil and gas supplies, and are likely to create jobs and local income. Smart-grid and off-grid solutions are often already cost-competitive and can bring energy services to rural areas, while more centralised and large-scale solutions such as 'smart' supergrids might be more compatible with growing urbanisation in the world. The transition to renewable sources is also a fundamental prerequisite to decarbonising the global economy.

It is nearly 20 years since the Rio Declaration on Environment and Development was proclaimed. Of the 27 key principles contained in the declaration, the majority can be strongly linked to human actions relating to energy, its use, its availability and its sustainability. It is nearly 15 years since the negotiation of the Kyoto Protocol, where countries agreed to reduce their greenhouse gas emissions, emissions generated in large part through the production and use of energy. As a global community, we have the commitment of organisations such as the United Nations and governments around the world to resolve these fundamental environmental and human issues. Energy is central to resolving these issues. We have the knowledge – we now need action.



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