

We can have a secure energy future – but do we want it?



by Walt Patterson

We can do it if we want to. That in eight words is the finding of the Global Energy Assessment, the most wide-ranging, all-embracing exploration of possible energy futures ever undertaken. This vast project, involving more than 500 scientists, policymakers, industry specialists, and energy experts from 70 countries, set itself a daunting task. It sought pathways to 2050 that would deliver universal and reliable worldwide access to modern energy services, while mitigating impacts on climate, health, air, water and environment. Of the 60 pathways examined, 41 could achieve these aims. Whether we follow the successful pathways rather than the failures is up to us.

The project has a long pedigree. It dates back at least to 1985, when four leading energy experts from four continents – Jose Goldemberg from Brazil, Thomas Johansson from Sweden, Amulya Reddy from India and Robert Williams from the USA – published in the *Annual Review of Energy* a paper entitled *An end-use oriented global energy strategy*. They followed it two years later with a remarkable book-length *tour-de-force* entitled *Energy for a Sustainable World* – far ahead of its time, especially in its whole-system approach and its explicit inclusion of all the related aspects of energy use, its interactions with water, land, health, environment and social and political processes. By 2001 the approach had attracted adherents from all over the planet, contributing to a World Energy Assessment co-sponsored by the United Nations Development Programme and the World Energy Council.

The Global Energy Assessment is the latest and most ambitious iteration of the study. Its sponsors now include not only WEC and the UNDP but three other UN agencies, the World Bank, and government, corporate and non-governmental organisations from Austria, Brazil, Germany, Italy, Norway,

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Sweden and the USA. It has been co-ordinated by the International Institute for Applied Systems Analysis (IIASA), with Goldemberg as co-president and Johansson as co-chair. The Technical Summary was launched at Rio+20 in June this year; the full 1900-page report will be published by Cambridge University Press this autumn.

Amid the recent plethora of ‘roadmaps’ and other prognoses for energy futures, the GEA stands out in one particular respect: it is not just about ‘energy’. Instead it uses ‘energy’ as an entry point into the nexus of interrelated problems now confronting global society. It shows how getting energy right will also help to solve other problems, such as clean water and sanitation, health, food supply, urbanisation and social and economic development.

No brief overview can do justice even to the Technical Summary, to say nothing of the full report. The Technical Summary is already available as a free download from http://www.iiasa.ac.at/Research/ENE/GEA/index_gea.html.

PDFs of the 25 chapters will also be available later this year. The GEA's top priority is ‘significantly larger investment in energy efficiency improvements, especially end-use’, coupled with ‘rapid escalation of investments in renewable energies... as well as the smart and super grids that enable renewable energies to become the dominant sources of energy’. It warns, however, that ‘energy system transformation is possible only if there is also an interactive and iterative transformation of the policy and regulatory landscape’, to foster ‘skills and institutions that encourage innovation to thrive, create conditions for business to invest, and generate new jobs and livelihood opportunities’.

In the GEA analysis and synthesis electricity plays a key role, significantly different however from traditional electricity. Electricity as a ‘modern energy carrier’ is a unifying theme, appearing more or less throughout all 25 chapters of the

report. It is a vehicle for energy efficiency, an essential basis for both rural and urban energy services, and a key system, technological and institutional, in the evolving transformation of human energy use.

One aim of the GEA is to ensure universal access to modern energy services, in particular electricity services and cooking, by 2030 – less than two decades hence. The successful GEA pathways include a gradual but continuing decentralisation of electricity systems; introduction and expansion of ‘smart’ and ‘super’ grids; establishment of microgrid systems as locally appropriate; dissemination of high-performance lighting, motors, electronics and other electrical user-technology; for fossil fuels a move to CCS (carbon capture and storage), co-firing with biomass and co-production of electricity, heat and liquid fuels; and a rapid increase in the proportion of electricity produced by renewable infrastructure generation. Nuclear power is optional. In some successful pathways it makes a significant contribution, in others it is phased out completely.

The report points out that ‘some energy options offer multiple benefits’ – including energy efficiency, renewables, and also ‘co-production of synthetic transportation fuels, cooking fuels and electricity with CCS’. This means that ‘nations and corporations can invest in efficiency and renewable energy for the reasons that are important to them, not just because of a global concern about, for instance, climate mitigation or energy security’. The report's final four chapters are devoted to policy recommendations: for energy system transformations, for energy access, for energy technology innovation, and for capacity building.

The GEA commentaries leave no doubt that the question now facing us is not whether we can achieve a sustainable future for ourselves and our descendants. We can. Even this late in the day the opportunities before us are abundant. The question is not whether we can do it, but – do we want to? MPS

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Walt Patterson's most recent book is *Keeping The Lights On: Towards Sustainable Electricity*. ‘Walt Patterson On Energy’, <www.waltpatterson.org>, is an online archive of his work since 1970.