RENEWABLE ENERGY TARGETS

WEC Statement 2003

Detailed definitions, classifications, technical data, production and consumption figures, reports and papers about renewable energy around the world are available on WEC's ***Global Energy Information System*** in a special "Renewables Corner" at www.worldenergy.org.

WEC Statement 2003
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Published February 2003 by:
World Energy Council
5th Floor, Regency House
1-4 Warwick Street
London W1B 5LT
United Kingdom

This statement is focused on the operational questions and economic challenges for renewable energy targets, which are evaluated in the context of the three goals of ***energy accessibility, availability and acceptability*** identified in WEC's millennium statement "Energy for Tomorrow's World—Acting Now!"

Overview of the WEC Position

WEC has done much work on various aspects of renewable energies and the policies that support them. This statement takes it as given that renewable energies, including large hydro and all forms of biomass, are already a significant part of the global energy mix, and WEC believes they could make an increasingly important contribution to supply diversification, emissions reductions and energy sustainability over the longer term.

In the short to medium term, however, modern renewables will remain a fairly small component of energy supply in industrialised countries, as a complement to rather than a replacement for fossil fuels and nuclear power. Their role in meeting the rapidly growing demand for reliable and affordable energy in developing countries will grow in importance, principally in rural areas, with targeted, temporary subsidies to support their use.

WEC does not support compulsory targets for any energy sources, since these inevitably lead to market distortions. When it comes to indicative targets, WEC does not support a global structure because of its inflexible nature; however, national or regional targets for renewable energy may help reach certain strategic goals. A clear vision of the goal the target is intended to achieve is of paramount importance. Whether it is emissions reductions, energy access and security or supply sources diversification, a proper assessment of the economic and technical fundamentals of various alternatives should be made. A full life cycle analysis is essential, since it could result in a rather different picture of the environmental impacts attributed to different fuels and technologies. There is also a need to better understand the market issues which, in different ways, shape energy services in industrialised and developing countries.

If, for example, the foremost objective of renewable energy targets is to reduce greenhouse gas (GHG) emissions, other ways of achieving the same goals should also be considered. Reducing primary energy consumption by improving efficiency in energy conversion, transportation and use can produce substantial benefits. Modest estimates of the potential for energy savings in buildings, industry and transport in some countries indicate that at least one-third of primary energy consumption could be saved without any change in end-use technologies. Investing in clean fossil fuel technology can often lead to much greater environmental benefits than supporting some currently immature renewable technologies, particularly in markets with over-capacity.

If, on the other hand, the main objective is to address problems of energy security or access, especially in developing countries with inadequate capacity, it is vital to consider that renewables, being primarily domestic fuels, should be treated on a case-by-case basis because their feasibility and true costs depend on local circumstances. Both a fully transparent pricing system and the role of targeted subsidies with sunset clauses need to be addressed. A level

playing field in terms of taxes and pricing, coupled with a transparent long-term energy strategy, is required to ensure success for indicative renewable energy targets at the national or regional levels.

Background

Some countries and regions have already established renewable energy targets, and it can be expected that many others will follow. The European Union, for example, has adopted an indicative target for renewable energy of 12% of gross domestic energy consumption and 22% of electricity consumption by 2010 (Directive 2001/77/EC).

The World Summit on Sustainable Development (WSSD) held in Johannesburg in August 2002 considered the introduction of a global renewable energy target. The concept originated from the Brazilian Energy Initiative, which proposed an increase in the use of renewable energy to 10% of total primary energy supply by 2010. After intense negotiations, no agreement was reached to support the proposed targets. Given the complexity and costs of negotiating, enforcing and monitoring any global targets, the WSSD agreed to:

> *"Diversify energy supply by developing advanced, cleaner, more efficient, affordable and cost-effective energy technologies, including fossil fuel technologies and renewable energy technologies, hydro included, and their transfer to developing countries on concessional terms as mutually agreed. With a sense of urgency, substantially increase the global share of renewable energy sources with the objective of increasing its contribution to total energy supply, recognising the role of national and voluntary regional targets as well as initiatives, where they exist, and ensuring that energy policies are supportive to developing countries' efforts to eradicate poverty, and regularly evaluate available data to review progress to this end".*

Drivers of Renewable Energy

Renewable energies have considerable potential and could theoretically provide a nearly unlimited supply of relatively clean and mostly local energy. In absolute terms, renewable energy supply has been growing strongly; the annual growth for wind energy, for example, has been around 30% recently, albeit from a very low base. In relative terms, on the other hand, the share of modern renewables, including large hydro, in the total primary energy supply has remained around 4%.

Most energy scenarios suggest that this share will hardly increase in the short to medium term. However, the *Alternative Policy Scenario* developed by the International Energy Agency in 2002 highlights the potential impact of the new energy and environment policies which are today under consideration in many countries. In this scenario, the share of renewables is projected to grow 40% more than in the reference scenario, and the bulk of this growth would take place in OECD countries. However, taking into account the long-term nature of energy projects, the value of existing infrastructure, the costs and the current immaturity of renewable energy technologies, it is obvious that renewables cannot replace fossil fuels or nuclear power in the next few decades, although they can help extend the duration of finite fossil fuels reserves.

Today, nearly 1.6 billion people in the world do not have access to modern, commercial energy of any sort. Most of these people live in developing countries, many in rural areas or isolated communities. Energy poverty is a primary reason for their poor living conditions and low prospects. Indeed, this situation poses a social challenge with huge implications for world peace, prosperity and progress.

In developing countries with inadequate supplies of electricity, renewable energy could (especially through distributed generation) provide an alternative to expensive extensions of the grid to sparsely populated or rural areas, or it could contribute to the grid-based energy mix to meet rapidly expanding electricity demand in urban areas. Additional benefits may include economic and social development from access to electricity, health benefits from access to clean energy for cooking and heating, income generation for local communities, capacity building, local employment and expertise.

In industrialised countries and economies in transition, often enjoying close to universal electricity access, governments see renewable energy primarily as a means of reducing or avoiding GHG emissions. However, accelerated development of renewables in the industrialised countries could facilitate technology transfers to developing countries and thus promote their economic development.

Technical and Environmental Considerations

The bulk of electric power cannot currently be stored in an economically feasible way. It has to be generated at the same time it is used, and electricity grids require power to be supplied at the rated frequency and voltage, free from harmonics, voltage surges and interruptions. A modern industrialised society depends heavily on stable and high quality power supplies to run industrial processes and information technology. There are, therefore, a number of operational aspects which have to be taken into account when specific energy targets are considered. For the deployment of renewables on a large scale, these include the intermittent nature of leading sources, the related problems of full integration with grids, low capacity factors and the need for back-up power.

When renewable energy targets are aimed at the reduction of GHG emissions, broad technical issues should be taken into consideration. For example, emissions per kilowatt-hour from conventional power stations are reduced by maximising their base-load operation; however, integration of some renewable generating capacities into the grid can increase frequency fluctuations, thus raising the overall emissions levels. Another issue, which in many cases is not fully taken into account, is back-up capacity to provide electricity at short notice, which most often relies on diesel or coal-fired generating units.

Another key aspect is emissions in transportation, which in different ways applies to most energy resources. If the energy required for the transport of natural gas via pipelines or as LNG, including the associated leakages, were taken into consideration, the environmental benefits of gas at the point of combustion would be partially offset by emissions during its transportation. Transporting coal over thousands of miles leads to additional emissions, which should be considered when evaluating different energy options. Similarly, the environmental benefits of modern biomass are in some cases reduced when it has to be transported over distances exceeding 30-40 miles. Again, the need for a full fuel cycle assessment is of utmost importance.

Some Economic and Market Issues

The economic case for renewables has improved rapidly over the past ten years, although with considerable support from subsidies. Some wind, small hydro and geothermal energy installations are becoming competitive in wholesale electricity markets; others, such as solar

photovoltaics, solar water heaters and biomass rely on subsidies to provide services in off-grid areas in developing countries. In remote rural areas, particularly in geographically dispersed islands, renewables (even with the full life cycle costing) might offer the optimal solution to the challenges of rural poverty.

Targeted subsidies for additional capacity which facilitate both accessibility and availability may be justified. These could be provided, for example, via the Clean Development Mechanism (CDM), Joint Implementation (JI) or accelerated technology transfer. If lower income households cannot afford basic energy services, a situation that creates negative impacts on health, education and economic development, then temporary "lifeline" consumer subsidies for high cost renewables might be justified, provided they are targeted, transparent and temporary.

The number one objective of energy market reform has been to foster competition and customer choice. If the total costs of energy are not reflected in the price paid by the final customer, there is a risk that the goals of market reform could be jeopardised. This applies to all energy sources. Political decisions to introduce renewable energy targets, or Renewable Portfolio Standards (RPS), to phase out nuclear power or to prioritise natural gas have, in some countries, led to a situation in which government regulations cover more than 50% of otherwise "competitive" markets, thereby undermining the most basic market principles. In Germany, for example, renewable energy and co-generation are supported by €2.5 billion per year, with another €5 billion collected through the electricity tax. Government interference in energy markets can be costly.

It can be argued that certain government support for renewables RD&D, in particular within the framework of international cooperation, can be justified to accelerate their development. However, shielding renewables from competition can also, in some cases, have a completely opposite effect. Removing competitive pressures can slow down further development of renewable technologies. There is also a danger that arbitrary decisions by governments to support specific renewable technologies can impede the development of other technologies, which could be more sustainable in the long run.

There is no single regulatory model for the smooth implementation of renewable energy targets. Different circumstances call for different solutions. Examples of regulatory techniques which can help minimise the impact on the competitive market dynamics are green certificates**,** green tariffs, embedded generation strategies and RD&D incentives. Whatever regulatory model is selected, it is necessary to ensure transparency, clarity and cohesion amongst market mechanisms, government policies and regulatory incentives.

The relevance and usefulness of renewable energy targets can vary significantly across countries and energy landscapes. Targets can work effectively in certain clearly defined cases, where it is easy to monitor their implementation. However, the process can quickly become complicated, costly and finally unfeasible, as the targets' nature and coverage expand. Compulsory targets tend to disrupt markets, and would increase costs and bureaucracy.

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World Energy Council
Regency House, 1-4 Warwick Street
London W1B 5LT
United Kingdom
Telephone: (+44) 20 7734 5996
Fax: (+44) 20 7734 5926
Email: info@worldenergy.org
Website: www.worldenergy.org