



**GREENPEACE**

Clean Energy for Sustainable  
Development

***Choose Positive Energy***

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## **Contents**

1. Summary	Page 1
2. The G8 Renewable Energy Task Force	Page 3
3. Sustainable Energy: A Priority for Development	Page 3
4. Renewable Energy	Page 5
5. Renewable Energy and Industrialised Countries	Page 7
6. Financing Renewable Energy	Page 8
7. Climate Change and Development	Page 10
8. Conclusion	Page 12
Appendix 1: G8 Task Force	Page 13

## **1. Summary**

The World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa in August 2002 provides an historic opportunity for world leaders to begin to make amends for ten years of failed promises, unfulfilled commitments and delay since the 1992 Earth Summit in Rio de Janeiro.

Finally, after more than 10 years of negotiations, the Kyoto Protocol to the UN Framework Convention on Climate Change is ready for ratification, and we repeat our call for governments to ratify the Protocol in time for the WSSD. However, Kyoto is just the first step on a long road, and the threat of global climate change looms even larger than it did 10 years ago. Current projections of increasing energy demand, following a 'business as usual' energy development path, threaten a massive disruption of the global biosphere during the course of this century. To achieve the dramatic emissions reductions needed to avoid dangerous climate change – of the order of 80% in OECD countries by 2050 - will require a massive uptake of renewable energy: a global effort on the scale of the Apollo Project to end the fossil fuel era and usher in a global economy run on renewable energy.

Energy is fundamental to economic and social development, both North and South. Yet, at the dawn of the 21st century, we are confronted with the unacceptable fact that there *are 2 billion people without access to basic energy services*. At the same time, we are facing the greatest threat to our collective survival *because* of our unsustainable use of energy. Climate change poses a severe threat to sustainable development itself, especially in developing countries in the South, that are the most vulnerable, yet least able to cope.

The energy choices the world makes in the next 20 years will determine our collective development path for many decades to come. Shall we choose to continue to go down the 'conventional' energy development path, using fossil fuels, nuclear and other 19th and 20th century technologies, despite the fact that they are ultimately unsustainable and have not delivered even the most basic of energy services to 2 billion of the world's poorest? Or shall we choose now to pursue a truly sustainable development path both North and South based on efficient use of sustainable, clean renewable energy?

Energy is central to all human economic activity. Access to basic, clean energy services is an essential pre-requisite for development and poverty alleviation, and provides major benefits in the areas of health, literacy and equity. When measured against the three pillars of sustainable development - environmental, social, and economic - the choice is clear. The threat of dangerous climate change, human health impacts, and the desire for equitable economic development, all argue in favour of a sustainable, renewable energy path.

Sustainable energy, as a cross-cutting issue, **MUST** be a priority on the WSSD agenda: we are asking governments to commit to a global program to encourage a massive uptake of renewable energy, which is necessary to meet both development and climate-protection goals.

We believe governments world-wide should adopt a two-fold strategy:

- ***commit to ensuring access to sustainable, renewable sources of energy to the 2 billion of the world's poorest people who currently do not have access to basic, modern energy services, within 10 years;***
- ***commit to rapidly accelerating the development of renewable energy markets globally to bring down technology costs and as the primary means to meet the drastic emissions targets necessary to combat climate change.***

To achieve this Greenpeace and WWF call upon governments to agree the following targets at the WSSD:

1. **A commitment to make available the finance and infrastructure to bring basic, affordable and sustainable energy services to the two billion people who currently live without them, within ten years.** This should be new and additional money, not 'stolen' from other development programs, already suffering from the failure of governments to live up to the pledges made in Rio. But money alone is not enough. The greatest challenge will be creating systems and networks to deliver the seed capital, institutional support and capacity building required to support and facilitate the creation of sustainable energy markets in rural areas of the developing world. Access to energy alone will not alleviate the grinding poverty of billions, but it is an essential prerequisite.
2. **A commitment by OECD governments to immediately target 20% of their energy sector lending and support in the form of guarantees via their Export Credit Agencies to renewable energy development and energy efficiency programmes.** This should be followed by a plan to phase out support for non-sustainable 'conventional' energy activities altogether, within 5 years. Many northern governments who have taken the issue of climate change seriously have adopted national renewable portfolio targets with positive results, but what is required is a consistency of policy at a local, national and international level reflecting a clear commitment to the development of renewable energy markets globally.
3. **A commitment by OECD governments to ensure that all International Financial Institutions they support make the same commitment,** i.e., an immediate target of 20% energy sector lending to renewable sources and efficiency, followed by a plan to phase out support for conventional energy sources within 5 years.
4. **A commitment by ALL governments to phase out subsidies to conventional energy sources, estimated at \$US 250-300 billion annually, within 10 years;** with a transition plan and flexible time frames to avoid undue hardships on developing country economies overly reliant upon conventional energy sources and exports; and recognising that meeting the development goals for the world's poorest will require subsidies for the foreseeable future. However, it is clear that these massive subsidies to the oil, coal, gas and nuclear industries are one of the primary barriers to the rapid global expansion of renewable energy.<sup>1</sup> Those countries which have signed the Kyoto Protocol have already made a commitment to examine, report on, and phase-out these subsidies [see note 26].
5. **A commitment by ALL governments to aggressive national renewable portfolio standards, energy efficiency standards and other measures to help build renewable energy markets.** The primary responsibility for this initiative must lie with the OECD governments, in keeping with the principle of 'common but differentiated responsibilities' enshrined in the Climate Convention.

The time has come for governments to send the political and economic signals that the renewable energy revolution starts **now**.

## **2. The G8 Renewable Energy Task Force**

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<sup>1</sup> Greenpeace International commissioned two substantial reports detailing the level of energy subsidies to conventional fuels: 'Energy Subsidies in Western Europe,' Free University, Netherlands, May 1997., 'Fueling Global Warming: Federal Subsidies to Oil in the US,' Industrial Economics Inc., June 1998.

The G8 established a Renewable Energy Task Force at their Okinawa summit in 2000 “to identify the barriers and solutions to elevating the level of renewable energy supply and distribution in developing countries”. The Task Force drew on the best expertise from around the world, and its report contains detailed and significant recommendations which, if agreed and implemented, would go a long way towards generating the global renewable energy revolution that is needed to combat climate change and improve the lives of billions of people world-wide. Key among these findings was the need for industrialised countries to take the lead in creating large renewable energy markets, both to meet climate protection objectives and to bring down costs; thereby helping to move industrialised countries on a pathway towards large long term emission reductions. A short summary of the Task Force’s findings is listed in Appendix 1.

The report calls for the G8 governments to set a target of bringing renewable energy to 1 billion people within a decade. While this is a laudable goal and an ambitious target, Greenpeace and WWF believe that there is a moral, political and environmental imperative for governments to go even further, as outlined above.<sup>2</sup>

### **3. Sustainable Energy: a Priority for Development**

Access to sustainable energy services is an essential element of sustainable development, as identified by the Commission on Sustainable Development (CSD) last year: ‘To implement the goal accepted by the international community to halve the proportion of people living on less than US\$1 per day by 2015, access to affordable energy services is a **prerequisite**.’<sup>3</sup>

However, energy has so far largely fallen between the environment and development agendas; and one third of the global population continues to live without basic energy services.

The failure to make this linkage was explicitly identified in UNDP’s 1997 assessment ‘Energy after Rio’: *‘Poverty has received scant attention from an energy perspective. This is remarkable given that energy is central to the satisfaction of basic nutrition and health needs, and that energy services constitute a sizeable share of total household expenditure in developing countries.’*<sup>4</sup> Energy expenditure is often a much higher percentage of household expenditure in developing countries than it is in the industrialised world. UNDP’s assessment points to the fact that the long hours of hard labour and health impacts resulting from the use of ‘traditional’ energy sources are rarely reflected in the energy-development equation, leading to an underestimation of the hardship endured by the poorest households.<sup>5</sup>

An empirical relationship has been shown to exist between improving the Human Development Index (HDI)<sup>6</sup> of the very poorest people and provision of even very small amounts of energy, as illustrated in figure 1.1 below:

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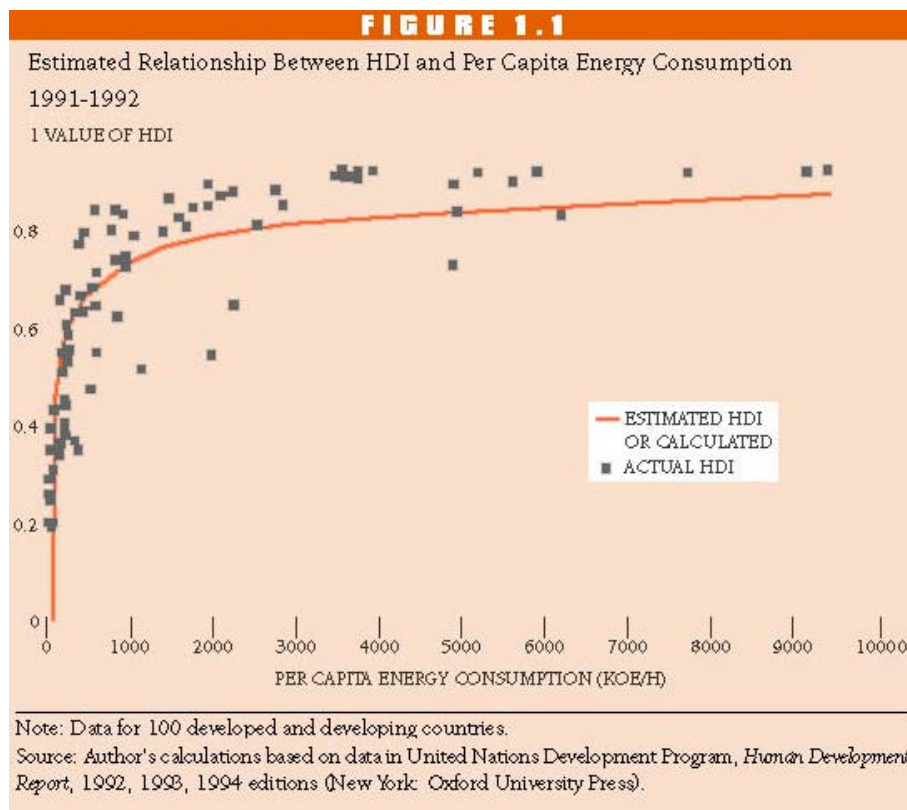
<sup>2</sup> “Renewable Energy: Development That Lasts. 2001 G8 Renewable Energy Task Force Chairmen’s Report”, published by the Italian Ministry of the Environment in co-operation with Oasis Magazine.

<sup>3</sup> Commission on Sustainable Development, ninth session, Agenda Item 4, Decision, Energy for Sustainable Development, Section 6.22

<sup>4</sup> ‘Energy after Rio, Prospects and Challenges,’ UNDP, 1997. Chapter 2 Energy and Major Global Issues, section 2.1.1.1.

<sup>5</sup> UNDP 1997, section 2.1.1.2

<sup>6</sup> As defined by the United Nations Development Programme (UNDP), the Human Development Index is a measure of life expectancy at birth, adult literacy levels + school enrolment and income per capita based on purchasing power parity; it has been developed as an indicator of human development, ref. UNDP’s Human Development Report [www.undp.org/hdr](http://www.undp.org/hdr) 2001.



Graph: Carlos Suarez, in 'Energy as an Instrument for Socio Economic Development,' UNDP 1995.<sup>7</sup>

For example, a solar power system with even just one light – affordable to 75% of rural Indian households, can extend the hours of income-generation activities (e.g. basket weaving) for women – thus contributing to empowerment, poverty alleviation and gender equality.<sup>8</sup>

Sustainable energy provision to poor households can play an important role in *accelerating* poverty-alleviation, especially when compared to the more standard strategy which focuses on macro-economic growth. Standard patterns of energy use result in negative impacts on nutrition, health and productivity, and benefits that might accrue from wider economic growth are likely to be absorbed only very slowly or not at all by people living in poverty, who often constitute the majority in developing countries.<sup>9</sup>

### Employment Opportunities

The job creation from the recent explosion of wind and solar industries has been well documented. Employment in the wind industry in Denmark is 16,000 people today. The industry is larger than the fishing industry in terms of sales value in Denmark. The European Wind Energy

<sup>7</sup> Carlos Suarez, 'Energy Needs for Human Development', Chapter 1 in J. Goldemberg and T.B. Johansson, (Editors) 'Energy As An Instrument for Socio-Economic Development', United Nations Development Programme, New York, NY, 1995.

<sup>8</sup> Professor Amulya Reddy 'Overview of Available Energy Technologies for Rural Development' paper for the Global Forum on Sustainable Energy, November 2001. Professor Reddy is a Board member of the International Energy Initiative, and a lead author of the UNDP report 'Energy after Rio'. His analysis points out that equity, empowerment and environmental soundness are key criteria for the choice and application of energy technologies with respect to the impact on the Human Development Index.

<sup>9</sup> UNDP 1997, Chapter 2 Energy and Major Global Issues, Section 2.1.1.3.

Association estimates that there are now 70,000 people working in the wind industry in Europe in turbine installation and manufacturing<sup>10</sup>. The booming wind industry in India has created thousands of jobs, a trend that appears likely to continue, and it is estimated that by 2020 the global wind industry will employ up to 1.7 million people.<sup>11</sup>

The solar photo-voltaic industry has also been undergoing double-digit growth in recent years, and it is estimated that by 2020, approximately 2 million jobs will have been created by the development of solar power around the world.<sup>12</sup>

The 30% per annum growth rate in the wind industry, and the 15-20% growth rate in the solar industry, are largely the result of portfolio targets and framework legislation enacted by just a few governments, including Denmark, Germany, Spain and India. With a truly global initiative embracing the full range of renewable energy sources, these numbers could, and should, be very much larger, very soon.

There is no reason that this growth cannot be replicated throughout the world, with the right government initiatives, with the same kinds of environmental, social and employment benefits.

#### **4. Renewable Energy**

Clean sources of renewable energy and energy efficiency have been acknowledged for at least a decade as a key part of the sustainable development agenda. However, progress in this area, as with the role of energy in tackling extreme poverty itself, has taken a back seat, as governments have prioritised instead the deregulation of energy markets, while at the same time leaving huge subsidies to conventional energy sources in place.

Conventional energy, and indeed, the deregulated markets, have not brought energy services to the rural poor, and have not captured the commercial opportunity for renewable energy.

WWF and Greenpeace believe governments must now prioritise the use and development of renewable energy sources and energy efficiency technologies: wind, solar photo-voltaics, solar thermal, passive solar, biomass, biogas, biofuels, small scale hydro and geothermal. This is needed both at the small scale household level to provide basic energy services to dispersed rural communities; and at the 'on-grid' urban industrial level, where technologies now exist with the capacity to deliver the services people and businesses require. The need for government to implement a regulatory framework that will stimulate renewable energy markets is clear.

Some believe there is an implied trade-off between immediate poverty alleviation and the use of renewable energy or efficient devices, and hence they get labelled as expensive or 'elitist'. But in most cases this is a false claim. Often, the costs of providing sustainable energy are lower than extending conventional electricity grids, or buying fuel oil, batteries and kerosene. In addition, equity, empowerment and environmental soundness are the criteria underpinning improvements in the Human Development Index<sup>13</sup> – an acknowledgement of the importance that the environment plays in well-being at a local or a global level. This means giving priority to environmentally sound, renewable energy services and increased energy efficiency at the point of use. All three factors are inter-linked and important<sup>14</sup>.

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<sup>10</sup> *Pers Comm Christian Kjaer, European Wind Energy Association Policy Officer*

<sup>11</sup> *Worldwatch press release 21 Sept 2000*

<sup>12</sup> *"The Solar Generation", Greenpeace International and the European Photovoltaic Industry Association, 2001*

<sup>13</sup> Reddy, 2001: *'The thrust must be on energy sources and devices that are renewable, biomass-based, universally accessible, affordable, reliable, high quality and safe.'*

<sup>14</sup> See also World Energy Assessment, Goldemberg Chapter 10 'Rural Energy in Developing Countries', Box 10.4 'Equity Issues Relating to Photovoltaic Technology for Rural Areas in India', page 377.

Clean renewable sources of energy, and particularly efficiency in the use of biomass, provide one solution for the acute health and respiratory impacts from traditional fuel sources<sup>15</sup> now well recognised at a local level. Indoor pollution is literally killing young children and women in the home in very poor households. Prolonged exposure to smoke dramatically increases the likelihood of very young children and women developing severe health problems such as acute respiratory infection and chronic lung disease, as well as raising the risk of still births, and is now being linked to blindness and immune system changes<sup>16</sup>.

Technical input to USAID/WHO found that “Acute respiratory infections in children under five years of age are the largest single category of deaths [and disease] from indoor air pollution, apparently being responsible for about 1.2 million premature deaths annually in the early 1990s<sup>17</sup>.”

The World Bank’s ‘Indoor Air Pollution’ newsletter identifies the key solutions for this situation which include more efficient stove design to reduce emissions and the utilisation of biogas and ‘clean’ biomass.

A final and often overlooked issue is the role that renewable energy can play in developing countries that rely heavily on oil and energy imports, in promoting greater energy security. Diversification of energy sources can help cushion the sometimes severe economic impact of price volatility of oil and other fossil fuels<sup>18</sup>, <sup>19</sup>. Furthermore, because renewable energy sources are indigenous, local and decentralised, their uptake can release the scarce funds, which would otherwise be put into large fossil fuel projects and fuel costs, towards important development goals in health, welfare and education. Renewable energy also has several benefits ranging from the possibility of greater local control over energy resources to infrastructure safety particularly in contrast to nuclear plants and oil and gas infrastructure, both highly vulnerable to sabotage.

Several major international summits in the last decade have emphasised the importance of renewable or sustainable energy in meeting development, environment, employment and gender equality issues. These include the

- 1992 Agenda 21, Rio de Janeiro
- 1992 UN Framework Convention on Climate Change
- 1994 UN Conference on Small Island Developing States, Barbados
- 1994 UN Convention to Combat Desertification
- 1995 World Social Summit, Copenhagen
- 1996 World Conference on Women, Beijing
- 1997 Habitat II, Turkey
- 2001 Conference of Least Developing Countries 3, Brussels
- 2001 Commission on Sustainable Development, 9<sup>th</sup> session, New York

In addition, the Regional Ministerial Precomms for WSSD, in late 2001 included general support for increasing the uptake and share of renewable energy sources. However renewable energy is

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<sup>15</sup> e.g. in UNDP, 1997, section 2.2.1.4.

<sup>16</sup> ‘Indoor Air Pollution, Energy and Health for the Poor’, newsletter of the World Bank Group, Issue No. 1, September 2000 <http://Inweb18.worldbank.org/>

<sup>17</sup> The Burden of Disease from Indoor Air Pollution in Developing Countries: Comparison of Estimates by Kirk R. Smith and Sumi Mehta, Environmental Health Sciences, University of California Berkeley, CA 94720-7360, Prepared for the USAID/WHO Global Technical Consultation on The Health Impacts of Indoor Air Pollution and Household Energy in Developing Countries May 3-4, 2000 Washington, DC. This is referenced in: ‘Energy and the Fight Against Poverty,’ Andrew Barnett, August 2000.

<sup>18</sup> Note that the Least Developed Countries’ conference (LDC3, May 2001) noted that oil price vagaries have sometimes cancelled out the impacts of debt reduction or cancellation, and that the two major increases in LDC debt levels were linked with oil price increases (A/CONF/191/LLL.13 –summary of the Interactive Thematic Session on Energy).

<sup>19</sup> ‘Energy after Rio’, UNDP, 1997 section 2.3.2.

not given explicit priority as an agenda item and is in danger of falling through the rhetorical cracks<sup>20</sup>. Nor are there yet specific initiatives on the table that would produce concrete results.

WWF and Greenpeace believe priority must be given to creating the financing and other regulatory and support structures necessary to prioritise renewable energy and energy efficiency to meet energy needs globally.

## **5. Renewable Energy and Industrialised Countries**

Accelerated uptake of renewable energy and energy efficient technologies is also central to a permanent shift away from fossil fuel dependence, which is the only way to achieve the significant cuts in greenhouse gas emissions required in order to avoid dangerous climate change. Despite commitments under the Kyoto Protocol, and widespread information showing the feasibility of renewable energy to meet industrial, grid-connected energy needs, conventional energy sources receive the vast bulk of energy investment nationally, as well internationally through investment banks and public financing institutions (see 'Money and Energy: Some Large numbers, p. 8). There is both the money and opportunity to rapidly expand the current renewable policy goals in industrialised countries.

As mentioned above, the recent global double-digit growth in the wind and solar industries has been driven by the policy initiatives of just a few countries. What is required is a global commitment to similar initiatives, although it is very difficult to be prescriptive in a precise way since each national or regional situation is different, but it is clear that there are two key elements:

- a) establishing Renewable Portfolio Targets: Governments must send an unambiguous political signal that developing renewable markets is a public policy priority.
- b) establishing a policy framework for the expansion of renewable energy markets.

The German 'feed-in' law and the Danish wind legislation which have fostered the rapid expansion of renewable energy markets in those countries are often held up as examples, but they are tailored to their national situations and may not be universally applicable. But the principles, targets and a policy framework creating an implementing environment, could, and should be universally applied.

The adoption by many countries and regions of renewable energy targets or obligations goes some way towards acknowledging that the market alone will not ensure the rapid uptake of renewable energy. However, this approach is patchy, and the positive environmental and social benefits are undermined through the continued existence of huge subsidies to conventional energy. Even governments that have adopted ambitious renewable energy targets domestically demonstrate inconsistencies as they have failed to extend this approach to their ODA and energy sector lending and credit support policies.<sup>21</sup>

It is also the case that 70-80% of the financing for power generation plants in the developing world currently comes from overseas bilateral aid, multilateral funding institutions and Export Credit Agency supported finance. Meeting a growing percentage of the rapidly expanding commercial energy markets in the developing world through renewables is a function of donor government policies in this area.

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<sup>20</sup> This is explicitly referenced in the World Energy Assessment: Energy and the Challenge of Sustainability, WEC, IIASA, 2000: 'Many rural development activities – agriculture, transport, water supply, education, income generation, health care – have energy requirements. Yet the Ministries and departments responsible for these activities rarely co-ordinate or cooperate with the ministry of energy, or with one another, to arrive at the most rational, integrated solution to their energy needs.' (Chapter 10, p 380)

<sup>21</sup> See "Exporting Global Warming – the UK's support for fossil fuel energy in the developing world", Greenpeace UK, 2002 at <http://www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/4483.pdf>

### *Money and Energy – some large numbers*

- Subsidies to conventional energy were still of a magnitude of US\$250-\$300 billion per year in the mid-1990s (World Energy Assessment, 2000)
- Current energy investments annually: US\$ 290 – 430 billion per year (1.0-1.5 per cent of global GDP). This is likely to double to 2-2.5 per cent of GDP if the anticipated growth rate of energy demand of 2.5 percent per year happens in the developing countries and countries with transition economies (E/CN. 17/2001/PC/20 Economic and Social Council Report on 'Energy and Transport' for CSD 9)
- ECA support from the US alone for fossil fuels between 1992 and 1998 amounted to \$23.2 billion. (WWF 2001, quoting IPS, 1999)
- The World Bank spent \$1.2 billion between 1994 and 1997 on energy efficiency and non-traditional renewable energy; but this represented only 7% of its energy loans (World Energy Assessment, p432, quoting World Bank statistics).
- Total private investment in developing country power sector, 1994-1998: US\$117 billion covering investments in greenfield, privatization and distribution activities. (World Energy Assessment 2000, Chapter 11)

## **6. Financing Renewable Energy**

The provision of finance is one of the core challenges to get sustainable renewable energy into the mainstream globally, and specifically to meet the development needs of the world's poorest people.

### Affordability

The issue of the 'affordability' of energy for the rural poor is critical. It is important to differentiate between the up front capital costs of a technology such as solar PV, and the operating or fuel costs for the household. Looked at over time, the life-cycle costs of renewable systems are often less than the purchase of kerosene for more traditional lighting, the use of diesel generators, or the purchase of batteries, even with the relatively high up-front capital costs figured in. The point is that for the very poorest people, at a household level, their ongoing costs often end up being much less for renewables, i.e., there are no on-going fuel costs. Also to be considered are the gains from not expending long hours of arduous labour (which often falls onto women) in providing very traditional forms of energy, i.e., gathering wood, collecting and drying dung, etc.

Renewable energy technologies, even at the most expensive end such as solar PV, are already cost effective in many cases when compared to the costs of extending the electricity grid. For example, in Morocco, to extend the grid to one village would have cost at least \$3000 per household, compared to about \$700 per household for a basic solar panel system, with five lights and a sufficient electricity for a radio or TV<sup>22</sup>.

### Consistency

It is also important that financial flows – public and private investments including ODA and FDI – both in industrialised countries and between north and south are coherent and integrated with environmental and social policy objectives. Otherwise, the expected benefits of greenhouse gas

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<sup>22</sup> Pers comm, Project Manager for Rural Electrification, CDER, the Moroccan Renewable Energy Development Centre, October 2001. The village in question was Ouled Ali Bem Ahmed, Province of Sidi Youssef Bem Ali, near Marrakech. Note that the villagers do not pay up front the cost of the solar system.

emission reductions in industrialised countries arising from policies to expand renewable energy, will be swamped by conventional energy investments FROM those same countries.

#### Energy for the '2 billion': how much will it cost?

If, as is generally accepted, it costs US\$500-\$1000 per household for the provision of basic 'modern' energy needs, and around 300 million households are identified as requiring this service, the total cost would be US \$150 – 300 billion, or \$15-30 billion per year spread over 10 years. How much of this will need to be in the form of direct public finance depends upon the model chosen to determine the quantity of investment from international finance institutions and private capital that this public finance will leverage; and at what point the market becomes self-sustaining. The G8 Renewable Energy Task Force Chairmen's Report uses a ratio of 1:5 between money from International finance institutions and the additional public and private money it can leverage: each dollar from, for example, the Global Environment Facility, has the capacity to pull in a further five. Also, it is suggested that after as little as 20% of the market has been 'seeded', further seed capital and second-stage finance may no longer be required. Those optimistic projections regarding the power of markets must be balanced with the goal of meeting the needs of the poorest communities, which will by definition require sustained subsidies and support.<sup>23</sup>

However, the challenge that practitioners emphasise is not so much the overall amount of money required, but whether this financing is in a form appropriate to the kind of local, small to medium-sized enterprises (SMEs) in developing countries that play an essential role in the delivery and support infrastructure. E&Co – an energy organisation focussing on seed capital provision and enterprise development services for renewable energy in the South – emphasises that commercial capital or even 'near commercial' programmes that insist on applying commercial capital rules and return requirements, are not appropriate.

Some of the most successful experiences that have emerged in the past decade for 'growing' energy markets in the off-grid rural sector in developing countries have been as a result of the emergence of 'Market Facilitation Organisations', which range from India's Ministry of Non-Conventional Energy Sources, to private power developers, to NGOs. They can provide the interface between the large tranches of capital available from donors and foreign investors and the local entrepreneurs who can make the markets work on the ground. They provide services for entrepreneurs such as partner matching, market research, technical assistance, financing and policy advocacy, and play an essential role in getting the large quantities of available capital for rural energy development 'down to the ground', where it is needed. E&Co estimate that there will be a need for around 60,000 SMEs in the rural renewable energy sector in the developing world to provide sustainable energy services for the 2 billion, but without a global spread of Market Facilitation Organisations (MFOs), it is unlikely that this sort of appropriate development will be possible.

A new authoritative paper on this subject, "Renewable Energy Markets in Developing Countries"<sup>24</sup> characterises them thus: "...MFOs operate with a business interest in the industry, but also with a public interest in seeing the technology widespread for a variety of public benefits. As a result, MFOs, even if initially supported entirely from public funds, usually end up obtaining a share of their funds from private sources in exchange for services." The creation of a global spread of MFOs, and using them to channel the required capital from domestic, private and international sources to the entrepreneurs on the ground seems at this point to be the most successful model for bringing energy to the world's 2 billion poorest. Governments should prioritise this NOW.

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<sup>23</sup> E&Co, Meeting the Unmet Demand for Modern Energy, October 2000

<sup>24</sup> Eric Martinot, Akanksha Chaurey, Debra Lew, Jose Moreira, Njeri Wamakonya, "Renewable Energy Markets in Developing Countries", accepted for publication in Annual Review of Energy and the Environment 2002 (Vol. 27)

Mechanisms for funding also exist within the Kyoto Protocol – with the Clean Development Mechanism creating the opportunity for additional investment in renewable energy and energy efficiency, and the Technology Transfer and Adaptation fund potentially also being available for sustainable development activities<sup>25</sup>.

Greenpeace and WWF believe that a three pronged approach is essential:

- commit funding for the next ten years from new public finance for rural sustainable energy development in developing countries, targeting first those that require off-grid basic modern energy services; and subsequently on-grid and transport-related supply. This should be part of a country-led assessment of energy policy goals, and should prioritise renewable energy and energy efficient devices.
- commit to immediately redirecting 20% of current energy lending from international financial institutions, export-credit agencies and other publicly controlled agencies' to renewable energy, as part of a wider reform of these institutions with respect to the impact of lending for sustainable development globally. This can be seen as extending the widely accepted notion of a renewable energy portfolio obligation.
- commit to assessing the regulatory framework and status of energy subsidies in industrialised countries with a view to ensuring they support rather than undermine renewable energy development and greenhouse gas emissions reductions, with the goal of phasing out such subsidies over 10 years. Governments signatory to the Kyoto Protocol have already agreed this, we suggest the 10 year timeframe to get the process moving.<sup>26</sup> An ancillary goal should be to condition the continued growth and interest in private sector investment funds dedicated to renewable energy<sup>27</sup>.

## **7. Climate Change and Development**

No longer is there any doubt that human-induced climate change is a real phenomenon. The Intergovernmental Panel on Climate Change (IPCC), in its Third Assessment Report (2001), concluded that there is 'new and stronger' evidence that warming temperatures over the last half century are due to human activity.

Receiving far less attention are the likely impacts of climate change on developing countries, the implications for development, and the convergence between climate change adaptation strategies and sustainable development. **There is a need for explicit recognition that climate change poses identifiable and serious risks to achieving international and national development goals. The next essential step is to create a greater sense of urgency over the shift to a solutions-based pathway – both for preventing climate change and adaptation to its impacts.**

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<sup>25</sup> LDC3 Programme for Action has already acknowledged the additional incentive to invest in energy sector improvements. Additionally, the IPCC Third Assessment Report, Technical Summary of the Working Group II report on 'Impacts, Adaptation and Vulnerability', notes 'Activities required for enhancement of adaptive capacity are essentially equivalent to those promoting sustainable development.' (section 6.2) It sees an opportunity for jointly pursuing both climate change adaptation and sustainability, and equity goals simultaneously.

<sup>26</sup> From the Marrakech Accords, page 48: "Agrees that Parties included in Annex II to the Convention, and other Parties included in Annex I in a position to do so, should give priority, in implementing their commitments under Article 3, paragraph 14, of the Kyoto Protocol, to the following actions:

(a) The progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors, taking into account the need for energy price reforms to reflect market prices and externalities, in pursuit of the objective of the Convention;

(b) Removing subsidies associated with the use of environmentally unsound and unsafe technologies;

<sup>27</sup> See, for example, 'Inventory of sustainable Energy Funds', UNEP Financial Initiative ([www.unep.fi](http://www.unep.fi)) and the Basel Agency for Sustainable Energy (BASE), September 2001.

The Ministerial PrepCom for Africa made direct reference to the impact that natural disasters and the “significant human, social and economic losses thereby posing a major obstacle to the African continent's efforts to achieve sustainable development”.

While uncertainties over specific regional impacts do exist the IPCC reaches some clear conclusions:

“The effects of climate change are expected to be greatest in developing countries in terms of loss of life and relative effects on investment and the economy. For example, the relative percentage damages to GDP from climate extremes have been substantially greater in developing countries than in developed countries.” (Summary for Policy Makers, WGII 2.8)

“The most vulnerable regions and communities are highly exposed to hazardous climate change effects and have limited adaptive capacity. The ability to adapt and cope with climate change impacts is a function of wealth, scientific and technical knowledge, information, skills infrastructure, institutions, and equity.” (Tech Summary of WGII. 6.1)

“Climate adaptation and equity goals can be jointly pursued through initiatives that promote the welfare of the poorest members of society – for example, by improving food security, facilitating access to safe water and health care, and providing shelter and access to other resources.” (Tech Sum of WGII, 6.2)

“Particularly vulnerable regions include delta regions, low-lying small island states, and many arid regions where droughts and water availability are problematic even without climate change. Within regions and countries, impacts are expected to fall most heavily, in relative terms, on impoverished persons. The poorest members of society can be inferred to be most vulnerable to climate change because of their lack of resources with which to cope and adapt to impacts. (Tech Sum of WG II, 7.2.3)

Three issues of particular importance to many countries are: food security, health and El Niño impacts – which are briefly discussed further:

Food Security - A new report from FAO and IIASA concludes:

“The projected climate change will result in mixed and geographically varying impacts on crop production. Developed countries substantially gain production potential, while many developing countries lose. In some 40 poor developing countries with a combined current population of 2 billion, including 450 million undernourished people, production losses due to climate change may drastically increase the number of undernourished, severely hindering progress against poverty and food insecurity.”<sup>28</sup>

Health - “There is medium to high confidence that under climate change scenarios, there would be a net increase in the geographic range of potential transmission of malaria and dengue – two vector-borne infections each of which currently impinge on 40-50% of the world population.” (WGII – SPM)

“Extensive experience makes clear that any increase in flooding will increase the risk of drowning, diarrhoeal and respiratory diseases, and in developing countries, hunger and malnutrition. If cyclones were to increase regionally, devastating impacts would often occur, particularly in densely settled populations with inadequate resources. A reduction in crop yields and food

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<sup>28</sup> Fischer, Shah, van Velthuisen and Nachtergaele. ‘Global Agro-ecological Assessment for Agriculture in the 21st Century’, 2001; IIASA and FAO. It should be noted that the IPCC’s Third Assessment Report expresses its conclusions more cautiously, but the implications remain serious. For example: ‘It is established, though incompletely, that climate change, mainly through increased extremes and temporal/spatial shifts, will worsen food security in Africa.’ WGII, Summary for Policymakers.

production because of climate change in some regions, particularly the tropics, will predispose food-insecure populations to malnutrition..." WGII SPM

El Niño Impacts - The IPCC finds in its 2001 report 'global warming is likely to lead to greater extremes of drying and heavy rainfall and increase the risk of droughts and floods that occur with El Niño events in many different regions.' [SPM WGI]

## **8. Conclusion**

While the central role of renewable energy in meeting both development and climate protection goals has been recognized since Rio and before, we are just now beginning to see the beginning of an expansion in the uptake of renewable technology that was foreseen, but in a patchy, scattered manner. A number of things have changed in the past 10 years which make the WSSD a not-to-be-missed opportunity for jump-starting renewable energy globally:

- the Kyoto Protocol, and the negotiations leading up to it have led at least some governments to recognize that this is the way forward;
- the recent publication of the IPCC's Third Assessment Report gives new urgency to the need to tackle global climate change;
- the publication of the G8 Renewable Energy Task Force Chairmen's Report shows that the world's richest countries know what must be done, whether or not they admit it;
- the economic 'boom' in OECD countries and some parts of the developing world during the 90s has not delivered the level of poverty alleviation or environmental protection that some of the strongest advocates of liberalized markets promised;
- the technology development and market experience in the renewables sector is only now becoming available on a large scale;
- a new paradigm of development has emerged, one much more dependent upon market creation;
- and finally, after the events of September 11, energy security, vulnerability of energy supply and infrastructure, and the dangers of concentrating highly explosive materials in energy facilities are much higher on the agenda.

But one thing has not changed. It is up to governments to lead, to set targets and timetables, to provide the incentives and to set up enabling frameworks, and then, and only then, let the market do its work. WSSD is an opportunity we urge all governments not to miss.

## APPENDIX 1

### ***The G8 Renewable Energy Task Force***

The following points and recommendations from the G8 Renewable Energy Task Force's report are particularly noteworthy:

- The report clearly says that the only barriers to massive uptake and expansion of renewable are financial and political - not technological. This contradicts those who still say that the technology is not yet ready and further makes the case for action by governments. It recommends a plan to reduce technology costs by expanding markets.
- The report emphasizes life-cycle costs to show that renewables are often already competitive with conventional energy sources. The Task Force goes even further and recommends that renewable energy projects are developed and funded not only when they are a least cost option on a life-cycle basis, but also *"when they achieve protection of local and/or global environment at a reasonable cost."*
- The report states that successful promotion of renewables over the next 30 years will prove less expensive than a "business as usual approach" to the global energy supply.
- The Task Force recommends that G8 countries take steps to remove incentives and other supports for environmentally harmful energy technologies.
- The Task Force recommends the implementation of common environmental guidelines among the G8 Export Credit Agencies (ECAs) which include minimum standards of energy-efficiency or carbon intensity for ECA-financed projects.
- The Task Force recommends that global corporations, which are large consumers of energy, should commit to procure and use renewable energy.
- The Task Force recommends that G8 countries should take steps to *"remove incentives and other supports for environmentally harmful energy technologies, and develop and implement market-based mechanisms that address externalities, enabling renewable energy technologies to compete in the market on a more equal and fairer basis"*