

UNEP

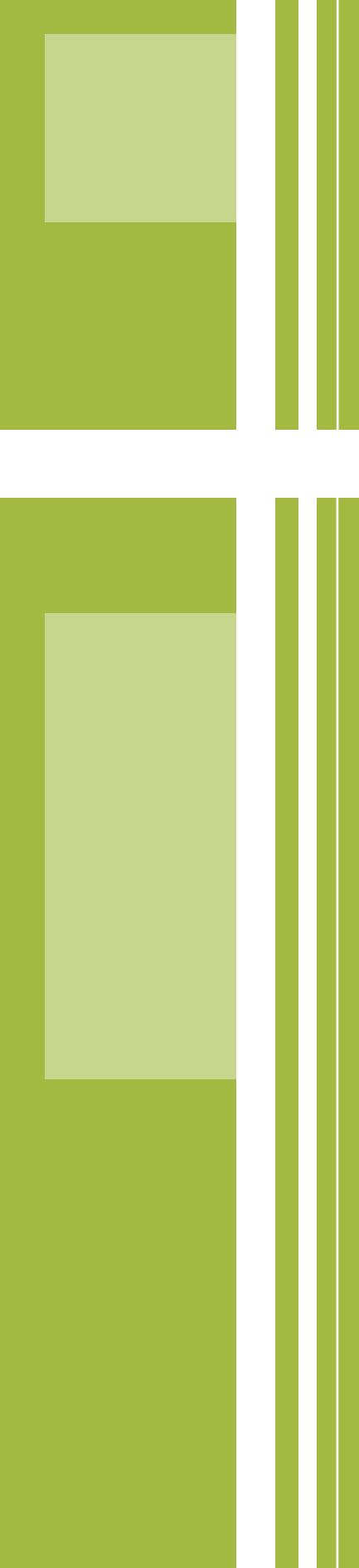
BACKGROUND

PAPER ON

GREEN JOBS



UNEP



UNEP

BACKGROUND

PAPER ON

GREEN JOBS

Disclaimers

The content and views expressed in this publication do not necessarily reflect the views or policies of the United Nations Environment Programme (UNEP) or of the contributory organizations, the International Labour Organization (ILO), and the International Trade Union Confederation (ITUC). Neither do they imply any endorsement. The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory or city or its authorities, or concerning the delimitation of its frontiers and boundaries. Mention of a commercial company or product in this publication does not imply the endorsement of UNEP.

Reproduction

This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. UNEP would appreciate receiving a copy of any publication that uses this publication as a source. No use of this publication may be made for resale or any other commercial purpose whatsoever without prior permission in writing from UNEP. Applications for such permission, with a statement of purpose of the reproduction, should be addressed to the Division of Communications and Public Information (DCPI), UNEP, P.O. Box 30552, Nairobi 00100, Kenya. The use of information from this publication concerning proprietary products for publicity or advertising is not permitted.

Produced by

United Nations Environment Programme
P. O. Box. 30552 Nairobi, Kenya
Tel. +(254) 20 762 45 57
Fax. +(254) 20 762 50 10
Email: civil.society@unep.org
Website: http://www.unep.org/civil_society/

Printing & Layout

United Nations Office at Nairobi, Publishing Services Section (UNON)

Acknowledgements

This background paper is produced based on the preliminary report prepared for UNEP in December 2007 by the Worldwatch Institute, with technical assistance by the Cornell University Global Labor Institute "Green Jobs: Towards Sustainable Work in a low Carbon World."

UNEP acknowledges the contributions made by the Worldwatch Institute (WWI) and the Cornell University Global Labor Institute. Special thanks are extended to the International Labour Organization (ILO), the International Trade union confederation (ITUC), and its member organizations.



TABLE OF CONTENTS

A. INTRODUCTION.....	4
B. RECENT CLIMATE CHANGE MESSAGES	5
C. GREEN JOBS AND WORKPLACES.....	7
1. Defining Green Jobs	7
2. What are the drivers of green employment?	8
3. Green Jobs: Now, and in the Future:	
a. Energy Supply Alternatives	9
b. Energy Efficient Buildings	11
c. Transportation.....	12
d. Agriculture and the Global Food System	13
D. WHAT NEXT: POLICIES FOR A GREEN JOBS STRATEGY.....	14
a. The Need for Government Action	14
b. A Green Investment Strategy.....	14
c. Green R&D and Technology Transfer	15
d. International Cooperation and Aid	15
e. Job Training.....	16
f. Dialogue to achieve a Just Transition.....	16
E. CONCLUSION.....	18
NOTES.....	19

A. INTRODUCTION

1. The **Green Jobs Initiative** is a joint initiative by the United Nations Environment Programme (UNEP), the International Labor Organization (ILO) and the International Trade Union Confederation (ITUC), which has been launched to assess, analyze and promote the role of employment in climate change, i.e. the effect of existing climate change impacts on employment and the employment consequences of future programmes for climate mitigation (aimed at reducing greenhouse gas emissions and addressing the drivers of climate change) and adaptation programmes (aimed at addressing the impacts of climate change). It supports a concerted effort by governments, employers and trade unions to promote environmentally sustainable jobs and development in a climate-challenged world.
2. Its objectives are:
 - to promote awareness and dialogue;
 - to identify and respond to knowledge gaps;
 - to facilitate a “just transition” that reflects the environmental, economic and social pillars of sustainable development;
 - to promote policies and measures to achieve green jobs and green workplaces;
 - to catalyze employment and poverty alleviation within climate mitigation and adaptation programmes; and
 - to strengthen collaboration between UNEP/ILO/ITUC, within the UN system and with the international business community.
3. This Background Note provides a brief review of our present understanding of Green Jobs and the impact of climate change on the world of work highlighting the potential role of the international business community in support of Green Jobs and Greener Workplaces. It includes a synopsis of recent climate change messages, a brief assessment of green jobs today and tomorrow, a brief review of key policies for a Green Jobs Strategy, and conclusions.

B. RECENT CLIMATE CHANGE MESSAGES

4. The “**Stern Review**” prepared by Sir Nicholas Stern, former Chief Economist of the World Bank, for the UK Government in October 2006 provided the first comprehensive assessment of the economics of climate change. The Review’s most important conclusions regarding the potential negative economic impact of climate change warrant reiteration: the costs of extreme weather events could reach 0.5-1% of GDP by the middle of the century; a 2 to 3 degree Celsius rise in temperature could reduce global output by 3%; and if that rise should become 5 degrees, up to 10% of global output could be lost. The Review also concluded that it would cost 1% of GDP to stabilize emissions at manageable levels. It also highlighted the role of employment creation programs in developing countries that help buffer households from the effects of poor harvests and other negative shocks.
5. The **IPCC Fourth Assessment Report** was released throughout 2007 in several stages. The Report of Working Group I presents the state of the art on the science of climate change. The **Report of Working Group II on Climate Change Impact, Adaptation and Vulnerability** provides new insights on the wide range of adaptive responses available to respond to climate change from technological, through behavioral, to managerial, and to policy responses, all responses that have direct and indirect employment consequences. The Report of Working Group III on Mitigation of Climate Change identifies a wide range of benefits and constraints for socio-economic development arising from possible mitigation measures. The report emphasizes that sustainable development and mitigation policies should stimulate technological innovation and could generate local employment, e.g. the adoption of efficient electricity production in developing countries could lead to higher employment and income generation. It also notes that a 20% savings of present energy consumption in the EU by 2020 can potentially create directly or indirectly up to **one million new jobs in Europe**, especially in the area of semi-skilled labor in the building sector. The report also acknowledges that the **lack of empirical studies has lead to much uncertainty about the implications of many mitigation measures on employment and incomes**.
6. The **UN High Level Event “The Future in our Hands: Addressing the Leadership Challenge of Climate Change”** was convened by UN Secretary-General Ban Ki-Moon on the eve of the UN General Assembly in September 2007. The event was aimed at securing political commitment at the highest level and building momentum for the UN Climate Change Summit in Bali. The Chair’s Summary notes that one of the key messages was: **“Action is possible now and makes economic sense. The cost of inaction will far outweigh the cost of early action.”** Quoting one of the Representatives: “development and adaptation efforts go hand in hand”, the Secretary-General went on to paraphrase that **“the public and the private sector also need to go hand in hand, through public-private partnerships”** and cited a business representative’s comment that **“the international community must give a signal that is loud, long and legal.”** The Secretary-General has made climate change one of his UN system-wide priorities which will include the Green Jobs Initiative.

- 
7. The **ILO Governing Body's 300th Session** in November 2007 held a special Working Party Panel discussion on: "**Decent Work for Sustainable Development—the Challenge of Climate Change**". The Panel included the Executive Heads of UNEP (Mr. Achim Steiner), World Meteorological Organization (Mr. Michel Jarraud), World Trade Organization (Mr. Supachai Panitchpakdi) and Worker (Mr. Joaquin Neto, International Labor Foundation for Sustainable Development - Sustainlabour) and Employer (Mr. Mathew Farrow, Confederation of British Industries) representatives. It provided a forum to discuss the growing consequences of climate impacts, mitigation and adaptation for Decent Work and the achievement of broader sustainable development and Millennium Development Goal (MDG) objectives.
 8. The **Conference of parties of the UN Framework Convention on Climate Change (UNFCCC) held** in Bali, Indonesia, in December 2007 launched far-reaching negotiations with a clear deadline of 2009 for the conclusion of an agreement on the post-Kyoto (post-2012) period. The Bali Conference of Parties successfully delivered the expected mandate and building blocks (adaptation, mitigation, technology transfer and financing) for the post 2012 period: the Bali Roadmap.

C. GREEN JOBS AND WORKPLACES

9. The multitude of different policy initiatives and responses to climate change currently being implemented, negotiated and studied at all levels of government and society will each have employment consequences and the pace of green job creation is likely to accelerate in the years ahead. A global transition to a low-carbon and sustainable economy will create large numbers of green jobs across many sectors of the economy and indeed can become an engine of sustainable development.
10. In order to address these issues in a more coordinated and coherent manner, UNEP has collaborated with the ILO and ITUC in the design and implementation of a major research study on Green Jobs by the Worldwatch Institute that has been funded by UNEP. It will be completed later in 2008, but a preliminary report entitled: **Green Jobs: Towards Sustainable Work in a Low-Carbon World** has been prepared in December 2007 and is available at the following website: www.unep.org/civil_society/Publications/index.asp.

1. Defining Green Jobs

11. In the UNEP/ILO/ITUC Preliminary Report “**Green Jobs: Towards Sustainable Work in a Low Carbon World**” (referred to as “Green Jobs report”), Green Jobs are defined as positions in agriculture, manufacturing, R&D, administrative, and service activities aimed at alleviating the myriad environmental threats faced by humanity. Specifically, but not exclusively, this includes **jobs that help to protect and restore ecosystems and biodiversity, reduce energy consumption, de-carbonize the economy, and minimize or altogether avoid the generation of all forms of waste and pollution**. A successful strategy to green the economy involves environmental and social full-cost pricing of energy and materials inputs, in order to discourage unsustainable patterns of production and consumption. A green economy is an economy that values both nature and people and creates decent and adequately paid jobs.
12. Greater efficiency in the use of energy, water, and materials is a core objective. The critical question is where to draw the line between efficient and inefficient practices. A low threshold will define a greater number of jobs as green, but may yield an illusion of progress. Given technological progress and the urgent need for improvement, **the dividing line between efficient and inefficient must rise over time. Hence, “green jobs” is a relative and highly dynamic concept—in other words there will be “shades of green” in employment.**

2. What are the drivers of green employment?

13. One of the most important drivers of green jobs is the substantial growth in investment necessary to achieve internationally agreed climate mitigation and adaptation objectives. The UNFCCC has estimated that US\$ 200-210 billion will go annually into mitigation by 2030 and tens of billions into adaptation. The UNFCCC has also estimated investments in energy supply infrastructure to be US\$762 billion (under their reference scenario) and US\$695 billion (under their mitigation scenario), with half of all energy investment needed in developing countries. UNEP has estimated that investment in sustainable energy alone is rapidly increasing with \$70.9 billion in new investment in 2006, 43% more than in 2005, and with a similar growth trajectory expected in 2007. The World Bank has estimated annual costs of adaptation in developing countries alone will be between \$9 and \$41 billion per year. Oxfam has suggested that it will likely be closer to \$50 billion per year. Given the magnitude of mitigation and adaptation investments for the future, it is important that a green jobs strategy be developed to ensure that these investments generate the green jobs and workplaces essential for a low-carbon society.
14. Green employment creation is often the result of the conscious decisions of companies to adopt more sustainable business practices---and the recognition by venture capital firms that clean technology development offers significant business opportunities. Many of the companies driving renewable energy solutions forward are small and medium sized enterprises that are highly innovative and dynamic ; they prize employees who are skilled, take individual initiative, and are oriented to problem-solving. More established companies also are playing a key role. Green innovation helps businesses stay at the cutting edge and hold down costs by reducing wasteful practices. Market leadership also may enable them to take advantage of such innovations to expand sales and exploit new export markets. Late adopters, by contrast, run the risk of falling behind on innovation.
15. At present, the global market volume for environmental products and services, including efficiency, recycling, water sanitation and efficiency, and sustainable transport, runs to about €1,000 billion and may reach €2,200 billion by 2020 .
16. Although environmental policies are sometimes seen as a potential threat to jobs, employment losses from not addressing the environmental crisis are likely to be far more serious: resource depletion, loss of biodiversity and ecosystem services, and storms, floods and droughts induced by climate change will exact ever growing costs and increasingly undermine the viability of many businesses and of livelihoods in agriculture.
17. Each green job also contributes to the greening of jobs in other parts of the economy. Put differently, the creation of green employment in one sector of the economy has the potential to "radiate" across large sections of the economy, thus greening commensurately large sections of the total workforce. For instance, even with strong growth in renewable energy sources, the energy industry itself will always remain a relatively small employer. But clean energy means that any business will have far less impact than they do today, when fuels and electricity are still largely produced from high-carbon and "dirty" resources.

3. Green Jobs: Now, and in the Future:

18. The Green Jobs Report presents an analysis of present employment levels, and provides estimates and projections of green jobs around the world. There are, of course, many remaining data gaps but it is possible to already foresee the many opportunities for green employment on the horizon. Governments, business associations and trade unions need to work closely together to improve the capture of relevant employment data in both newly emerging industries and in established sectors. At the same time, more effort is required to disaggregate data on the basis of gender so as to ensure that there is an equality of opportunity in future for both women and men in green jobs.
19. The following brief sections provide a preliminary overview of present and projected "Green Jobs" in several of the key sectors of the economy.

a. Energy Supply Alternatives

20. Employment in renewable energy is growing at a very fast pace, and the growth seems likely to accelerate in the years ahead. Moreover, compared to fossil fuels, renewable energy generates more jobs both per unit of capacity and per dollar invested.
21. Globally around 300,000 workers are employed in wind power and more than 100,000 in solar photovoltaics. In China, the U.S.A. and Europe more than 600,000 are employed in solar thermal—by far most of them in China. Almost 1.2 million workers are estimated to be employed in biomass in just four leading countries, namely Brazil, the U.S.A., Germany and China. Overall, in countries where data is available, the number of people employed in **renewables is presently around 2.3 million** (See Table 1). Given the present gaps in employment information, this is no doubt a very conservative figure.

Table 1. Employment Estimates in the Renewable Energy Sector,
Global and Selected Countries, 2006

Renewable Energy Source	World / Selected Countries ¹	Employment
Wind	World	300,000
Solar PV	World	115,000
Solar Thermal	China, Europe, USA	624,000 +
Biomass/Biofuels	Brazil, USA, China, Germany	1,174,000
Hydropower	Europe, USA	39,000
Geothermal	USA, Germany	25,000
Renewables, Combined		2,277,000

¹ Countries for which information is available.

- 22. Half of these jobs are in biofuels—mostly in agriculture (growing and collecting of feedstock), but also in (better paying) processing industries. There is vigorous and contentious debate over their economic and environmental cost and merits, their energy content and energy net balance, and whether they directly compete with food production.
- 23. Given strong and rapidly rising interest in energy alternatives, future years may well see worldwide employment soar—possibly as high as **2.1 million in wind energy** and **6.3 million in solar PVs by 2030**, and on the order of **12 million jobs in biofuels-related agriculture and industry**. This represents a possible total employment for renewables of over **20 million jobs by 2030**.^v
- 24. To place these “rough” figures into perspective, the total employment of the oil and gas and oil refining sector in 1999 was just over 2 million workers (ILO) and the formal Mining (Coal and other mining) sector was approximately 11 million workers (and this figure takes into account the loss of approximately 3 million jobs between 1995-2000) (ILO), air transport accounts for approximately 4 million workers (International Civil Aviation Organization, 2006).

b. Energy Efficient Buildings

25. Buildings use between 30 and 40% of all primary energy resources and their associated greenhouse gas (GHG) emissions! Energy efficiency improvements in the life-cycle of buildings, through both the design and construction of new buildings and the retrofitting/renovation of old buildings, provides major opportunities for employment and for the reduction of carbon emissions in both developed and developing countries. The McKinsey Global Institute has stated that four out of the five most cost-effective measures to reduce greenhouse gas emissions involve energy efficiency in buildings: i.e. building insulation, lighting systems, air conditioning and water heating (the fifth is improved efficiency of commercial vehicles) and the IPCC Fourth Assessment Report has estimated that by 2020 CO₂ emissions from building energy use can be reduced by 29% at no net cost, i.e. the benefits are expected to offset the cost of the investment.
26. A number of important global and national initiatives^{vii} and recent reports^{viii} have highlighted the opportunities for action in this area, and they all stress the vital importance and timeliness of developing new and effective policy incentives to ensure that the buildings of tomorrow reflect the climate change challenges of today and the future, especially as the carbon footprint embedded in the design and structure of today's new buildings are expected to remain part of the built "environment" for many years to come.
27. A myriad of jobs are likely to be directly created in green building and the retrofitting process, and most are created during the initial construction or investment period and are likely to be local jobs, which is especially beneficial for developing regions as well as areas of high unemployment. Some data on current levels of green employment specific to the building sector already exist, but they tend to be small snapshots of a particular project or country, rather than a more comprehensive picture of the sector. Future employment projections have been especially promising in this sector.
28. There is also growing concern that hopes to meet the MDG-7 objective to achieve significant improvement in lives of at least 100 million slum dwellers by 2020 are dimming. Climate change and especially extreme weather events have already demonstrated the tremendous destructive power of floods in urban slums and there is an urgent need to "climate proof" slums to reduce the vulnerability of slum areas to both climate change and poverty while also generating new "green jobs".
29. Such programmes in the building sector will require enormous private and public investments and most of the changes required to shift to the greening of the building sector can primarily be done with existing technology with little or no net cost and with the added benefit of creating millions of jobs in the building, manufacturing and other sectors.



c. Transportation

30. The transportation sector is a cornerstone of modern economies and an important source of jobs. Characterized by a heavy reliance on cars and trucks—and increasingly on airplanes—for both passenger and freight movement, transportation is a major consumer of fossil fuels, an important source of urban air pollution, and a big contributor to climate change. According to the IPCC, the sector has the fastest-rising carbon emissions of any end-user sector.
31. Leadership in pursuing fuel economy and cleaner cars is essential to the future viability and employment in the automobile industry. Companies that lag in this regard run the risk that their vehicles will increasingly fall short of fuel economy mandates and, as fuel prices rise, lose favor with consumers. The global employment implications of greener cars are difficult to estimate due to limited availability of relevant data and incompatible standards and reporting categories among different nations, but also because fuel efficiency is far from a static concept, and there are no unambiguous thresholds that separate gas sippers from gas guzzlers.
32. Railways are more labor intensive than the car industry. But the trend over the last few decades has been away from railways in many countries. A sustainable transport policy needs to reverse this trend. High-speed rail can compete well with both automobiles and trucks and, over certain distances, with aviation and the construction and operation of such systems should provide new green employment.
33. Buses, trams, and railways use far less energy per passenger- or freight-kilometer than cars. Jobs in manufacturing the requisite vehicles and equipment and in operating these systems are, in principle, green jobs. There are also substantial green employment opportunities in retrofitting older diesel buses and in manufacturing new buses that run on alternative fuels including compressed natural gas (CNG) or hybrid-electric buses. Similar retrofits are needed for the highly-polluting two-stroke engines that are ubiquitous in two- and three-wheelers in developing countries, and particularly in Asia.
34. Hundreds of millions of people in developing countries suffer from insufficient mobility and innovative approaches will be needed to meet their mobility requirements that should be designed so as to also generate new “green” employment opportunities.

d. Agriculture and the Global Food System

35. In key parts of the economy such as renewables, building efficiency, and transportation, win-win (i.e. mutually beneficial outcomes) and double dividend (i.e. simultaneous benefits, e.g. monetary and social) employment scenarios are encouragingly evident. In the **case of agriculture, however, a green jobs scenario will require policy interventions to overcome a series of formidable obstacles**. These obstacles to green employment can be located at all points of the global food system, from the threatened livelihoods of small farmers; the energy and chemical inputs used in intensive farming; the expansion of certain plantation crops; the growth of intensive livestock systems as a result of rising meat consumption; the globalization of food production chains; the rising market power of large retailers; and the problem of vast amounts of greenhouse-gas-producing food waste in the developed world.
36. One thing is clear: **the employment trend in food and agriculture is actually moving away from sustainability and decent work**. At the base of the supply chain, low input and relatively sustainable forms of smallholder agriculture are being squeezed on all sides and the proportion of the world's population making their main living from agriculture is in sharp decline. The evidence suggests that **considerable green employment benefits are embedded within an emphasis on sustainable small-scale farming**. Small farming systems certainly employ more people than mechanized farms and/or plantations. High-yield sustainable farming is knowledge intensive and requires research and extension systems that can generate and transfer knowledge and decision-making skills to and between farmers. Developing the ecological literacy of farmers could, therefore, create significant employment and more sustainable livelihoods. Policies supporting the expansion of urban agriculture are also needed. **Already 800 million people are engaged in growing food in urban areas, primarily in developing countries**. The employment benefits of sustainable urban agriculture are potentially enormous. The jobs dividend associated with local food systems in the developed world is also becoming clear. These systems help sustain local economies while returning a larger share of the proceeds to the producers—reducing emissions from “food miles” at the same time.
37. Other policies to advance sustainability have been shown to create green jobs, such as **payment for environmental services (PES)**. In the UK, the English Countryside Stewardship Scheme has created jobs for farmers, contractors and other small rural businesses. In Central and South America silvopastoral practices have developed in Columbia, Costa Rica and Nicaragua to conserve forests that raised farmer income by 10-15 percent. These examples suggest that a global shift toward PES could generate very large numbers of jobs, especially when administered as public works projects.
38. Given the fact that 1.3 billion people are presently involved in agriculture, a truly global transition towards more labor-intensive sustainable methods could make a major contribution to poverty alleviation and create many millions of new jobs and preserve those green or relatively green livelihoods that already exist.



D. WHAT NEXT: POLICIES FOR A GREEN JOBS STRATEGY

39. The Green Jobs Report has identified six key policy areas necessary to support a Green Jobs Strategy.

a. The Need for Government Action

40. Timely action on the scale needed to address climate change will occur only with a strong set of internationally and nationally agreed targets and mandates, and policy changes that will put an end to today's unsustainable practices. An ambitious mix of regulations, business incentives, and genuine public-private partnerships is required.
41. While private companies have an important role to play in terms of investments and green job creation, their risk and profit appraisal and their time horizon does not necessarily match with the scale, urgency, and long-term perspective of the public agenda emerging in response to the climate challenge. Recent business, governmental, and UN reports underline this point. McKinsey & Company does not mince words in stating that "Without a forceful and coordinated set of actions, it is unlikely that even the most economically beneficial options would materialize at the magnitudes and costs estimated here."^{xi} The Stern Review argues in favor of "a strong technology policy framework that drives action by the private sector." And the *Human Development Report 2007/2008* of the UN Development Programme (UNDP) concludes that a range of barriers to a breakthrough in climate change mitigation "can only be removed through government action. Public policies on regulation, energy subsidies and information have a central role to play."
42. The governmental toolbox offers many appropriate instruments: including, public investment, subsidy shifts, new R&D priorities, and ecological tax reform. Among non-financial or – fiscal measures, extended producer responsibility laws, eco-labeling, and specific sets of targets, mandates, and promotion of green alternatives — especially in the energy field — play an important role. The tools are available, but they need to be applied with much greater urgency if large-scale green employment is to become a reality.

b. A Green Investment Strategy

43. Investment creates employment. Without adequate investment the number of new green jobs, or the greening of existing ones, will be impaired. Adequate public and private funding of climate mitigation and adaptation measures in all countries could create innumerable jobs, including in renewable energy technologies, fuel economy technologies for transport, energy retrofits of homes and buildings, and climate change adaptation.

- 
- 44. New and innovative approaches to investment and financial services will be needed. For example, there are hundreds of new insurance initiatives that are aimed at reducing climate-related financial losses that may also help protect existing jobs and generate new employment opportunities as a result of decreased risks for future investments.^{xiii}
 - 45. Special efforts will be needed to ensure that such green investments generate decent, green jobs and this would be significantly facilitated through dialogue among governments (including Ministries of Finance, Environment, Labor, and Trade), and employers and workers.

c. Green R&D and Technology Transfer

- 46. The continued development and diffusion of green technologies is critical to a green jobs future. As the Stern Review notes, however, real levels of R&D in low-carbon technologies have actually fallen sharply in recent decades. The competitive calculus of private companies may be at odds with the need to share cutting-edge green technologies as rapidly as possible. New mechanisms need to be developed that overcome obstacles to expedited and more widespread technology diffusion. **Innovative public-private partnerships can be part of the solution. Cooperative R&D centers that anchor green technology development in the public realm are another. An adequate financial mechanism to expedite the spread of green technologies** is urgently required, and the first steps towards achieving that appears to have been made in Bali, but much more will need to be done in future. Technology transfer will also require more dynamic dialogue and collaboration between governments, the business community, workers and local communities.

d. International Cooperation and Aid

- 47. 2007/2008 edition of the *Human Development Report* of UNDP laments rightly that "To date, international cooperation on adaptation has been characterized by chronic under-financing, weak coordination and a failure to look beyond project-based responses." The contrast between the money being spent on climate change adaptation efforts in rich countries and the amounts spent in poor countries could not be more stark. The UK, Germany, the Netherlands, Italy and the United States have spent billions of dollars on flood defenses and other protection measures, creating thousands of jobs in the process. However, currently only \$26 million has been spent multilaterally for adaptation measures—a figure that, notes UNDP, is the equivalent of one week's worth of spending on flood defenses in the UK. The lack of adaptation spending not only impedes the development of green jobs, it can lead to many existing jobs being lost and livelihoods wrecked (particularly in agriculture) as a result of climate-related disasters. Without significantly enhanced international cooperation and aid, the prospect of generating significant new green and sustainable employment in developing countries through meeting climate adaptation and mitigation will be lost.



e. Job Training

48. Investment to create green jobs is one side of the jobs coin; training and skill development is the other. Both are necessary to bring green employment to its full potential. **Shortages of skilled labor could put the brakes on green expansion.** There is thus a need to put appropriate education and training arrangements in place. The best approach—whether to focus on trade schools, universities, on-the-job training in the workplace, or some other arrangement—will vary from country to country, given different educational systems.
49. Green employment is not limited to high-end skills. In both developing and industrialized countries there is increasing need for what some have termed “green collar” training in a broad range of occupations besides the most highly educated positions. It is important both to **prepare the workforce at large for the skill requirements inherent in green jobs and to ensure that green industries and workplaces do not face a shortage of adequately trained workers.** This is an important commitment to people (women and men) in poorer and disadvantaged communities —providing a ladder out of poverty and connecting green jobs with social equity. For example, proposed U.S. legislation would provide funding of up to US\$125 million to establish job training programs, curricula, and job standards on the federal and state levels, and the “Green for All” campaign is working to secure US\$1 billion by 2012 to “create green pathways out of poverty” for 250,000 people in the United States.
50. Promoting such job training is equally important in developing countries. A variety of U.N. and other international agencies such as UNEP, ILO, UNIDO (United Nations Industrial Development Organization), UNITAR (United Nations Institute for Training and Research) working in conjunction with business, trade unions, and community organizations, could play a critical role in **setting up green training and expertise centers in developing countries.** Training and education for green jobs will also need to emphasize gender equality. The German experience suggests that women are strongly under-represented in the renewables sector, and especially in science and technology-intensive jobs.

f. Dialogue to achieve a Just Transition

51. Green employment gains need to be balanced against significant and unavoidable job losses incurred as a result of the movement towards a low-carbon and sustainable society. **Overall, far more green jobs will be created in the move toward a sustainable economy than jobs lost.** But for affected workers, as well as their families and communities, transition assistance is needed. Employment in fossil fuels and other industries may suffer from substantial efforts to move toward a low-carbon, high-efficiency economy. Furthermore, while greater vehicle fuel efficiency may not necessarily harm auto industry jobs, a far-reaching modal shift to public transport would.

- 
52. Especially where industries are highly concentrated in one or a handful of regions, these **impacts can have serious consequences for the local economy and the viability of communities**. These regions will need pro-active assistance in creating alternative jobs and livelihoods, acquiring new skills, and weathering the transition to new industries.
 53. **Active labor market policies and broad social protections are therefore essential to ensure a fair and just transition for workers and their communities.** This must involve income protection as well as adequate retraining and educational opportunities and, if necessary, resources for relocation. However, **today a “just transition” is still more principle than reality.**
 54. **The role of the trade unions is critical to the success of the green jobs strategy,** and an implacable commitment to just transition on the part of policymakers and business will ensure maximum trade union cooperation within a framework of social dialogue and freedom of association. Unions internationally have immense experience in worker training and education, and can both expedite change and enhance the quality of new and reconfigured jobs and greener workplaces. Trade unions have been very actively involved and committed to participating in the UN system-wide activities related to climate change and sustainable development with a view to sharing their extensive experience and capacity to help generate green jobs and also facilitate a fair transition to a low-carbon world.
 55. Similarly, **employers organizations can also play a key role in facilitating the achievement of greener jobs and workplaces** in many countries through the extensive development of measures to assist their members by providing support for skills and management training, R&D, technology transfer and facilitating information and access to financing.

E. CONCLUSION

56. It is absolutely clear that, despite the gaps in present green jobs data, we are presently on the verge of an exciting “green” transformation of our economy. The key is to identify how we can make this transformation happen—as quickly and as efficiently as possible. The UNEP/ILO/ITUC Green Jobs Initiative is well on its way to tackle some of the critical data and informational challenge and has identified the key policy areas for action, especially within their constituencies.
57. The question now is how these efforts can best be linked to those of the international business community so as to realize this transformation on a scale, at a pace and all across the globe. The Green Jobs Initiative is ready to work with the business community to facilitate the greening of jobs and workplaces as part of corporate sustainable development policies and other relevant corporate initiatives. CEOs are encouraged to set in motion practical assessments of opportunities within their own companies and sectors for the further greening of jobs and workplaces. Investors and stockholders are increasingly demanding that companies assess how they are responding to the challenges of climate change — and development of green jobs and workplaces needs to be part of that process.
58. One approach may include the development of a more integrated approach to the assessment of “productivity” — that effectively links labor, energy, materials and environmental productivity in support of greener jobs and workplaces. Such an approach would also provide an excellent opportunity for productive dialogue between management and workers and as well could foster constructive dialogue and collaboration with local communities.
59. One of the most important lessons from the Green Jobs report is the special and significant advantages green innovation has generated for corporations that have been leaders: improved environmental performance; increased profits; early access to export markets for their innovations; improved opportunities to attract and retain qualified workers who are increasingly looking for greener jobs and employers; and management experience in transforming their companies that may help them confront other challenges and also may generate the sale of management services and know-how to others.
60. UNEP/ILO/ITUC, through their joint Green Jobs Initiative, look forward to collaborating with the green leaders of tomorrow in this exciting transformation to ensure that our economies meet the climate challenges—while putting our employees and population to work.

NOTES

-
- ⁱ See ILO website (www.ilo.org) for GB.300/WP/SDG/1 (Background paper).
 - ⁱⁱ UNEP/Sustainable Energy Finance Initiative (SEFI) *Report on Global Trends in Sustainable Energy Investment 2007*.
 - ⁱⁱⁱ See for example, ILO Conference discussion and decision on Sustainable Enterprises, June 2007.
 - ^{iv} Summary of a Roland Berger Strategy Consultants study published by the German environment Ministry: "Green Tech made in Germany. Umwelttechnologie-Atlas furDeutschland," at http://www.bmu.de/files/pdfs/allgemein/application/pdf/umwelttechnikatlas_zsf.pdf .
 - ^v Preliminary Report: Green Jobs: Towards Sustainable work in a Low-Carbon World, WorldWatch Institute, December 2007 (p.65) at www.unep.org/civil_society/Publications/index.asp/
 - ^{vi} Cited in *Building Energy Efficiency: Why Green Buildings are key to Asia's Future*, Asia Business Council, 2007. See also: *Curbing Global Energy Demand Growth: The Energy Productivity Opportunity*, McKinsey Global Institute, (May 2007).
 - ^{vii} World Green Building Council (WGBC), UNEP's Sustainable Buildings & Construction Initiative (UNEP-SBCI), the Marrakech Task Force on Sustainable Buildings and Construction led by Finland, and the United States Green Building Council.
 - ^{viii} See: e.g. *Buildings and Climate Change: Status, Challenges and Opportunities*, (UNEP, 2007); *Energy Efficiency in Buildings: business realities and opportunities* (World Business Council for Sustainable Development, 2007); and *Building Energy Efficiency: Why Green Building are Key to Asia's Future* (Asia Business Council, 2007).
 - ^{ix} See e.g. *Climate Change, Urban Flooding and Rights of the Urban Poor in Africa*. ActionAid (2007)
 - ^x Barker T., et al., "Technical Summary," in *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, UK and New York: Cambridge University Press, 2007), pp. 48-49.
 - ^{xi} John Creyts, et. al., *Reducing Greenhouse Gas Emissions: How Much at What Cost?*, U.S. Greenhouse Gas Abatement Mapping Initiative, Executive Report (McKinsey & Company and The Conference Board, December 2007), p. xii.
 - ^{xii} *From Risk to Opportunity: 2007: Insurance Responses to Climate Change*, by Evan Mills, Ceres, Oct 2007).

www.unep.org

United Nations Environment Programme
P.O. Box 30552, Nairobi 00100, Kenya
Tel: +254-(0)20-762 1234
Fax: +254-(0)20-762 3927
Email: uneppub@unep.org
web: www.unep.org

