



UNITED NATIONS

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European Commission - Energy and Transport Directorate-General consultation:

Biofuels issues in the new legislation on the promotion of renewable energy

Contribution from the United Nations¹ (UNEP, FAO, UNDP, UN-HABITAT, UNIDO and WHO) to the consultation

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Context

Climate change is now widely recognized as a major threat for the planet. Combating it is one of the first priorities of the Secretary-General of the United Nations, Ban Ki-moon. The United Nations recognizes the crucial importance of energy to achievement of the Millennium Development Goals. While Goal 7 sets global goals for environmental sustainability², in reality none of the 8 MDGs - particularly Goal 1 - Eradicate extreme poverty - can be met without major improvement in the quality, quantity and accessibility of affordable energy services to the world's poor.

While noting the need to increase drastically environment-friendly production of energy, the UN also calls for a reduction in energy consumption by industrialized countries and in particular increased energy efficiency. The UN Millennium Project pointed to the “need [for] a major policy push to promote energy efficiency, to generate new energy technologies, and to promote advanced and cleaner technologies”³. Addressing the Commission on Sustainable Development (CSD) in May 2007, the Secretary-General highlighted that “Energy, climate change, industrial development and air pollution are critical items on the international agenda. Addressing them in unison creates many win-win opportunities and is crucial for sustainable development.”⁴

The United Nations has welcomed the European Union's commitment to reduce its greenhouse gases, and its decision to establish targets for energy efficiency and the use of renewable energy sources.⁵ The UN welcomes the conclusions of the most recent meeting of the EU Transport and Energy Council (8 June, 2007) which defined a new European energy strategy for transport calling for efficiency improvements in all transport sectors. On the topic of this consultation, the EU transport and energy Ministers expressed optimism about the potential impact of biofuels, but stressed the need to ensure their sustainability. The UN underlines the importance of this latter point. The 2020 target decided by the EU at its Spring Summit in March 2007, of a 10% target for the share of biofuels used in transport, implies imports of biofuels to the

¹ The United Nations agencies, funds and programmes referred to have participated in the preparation of this document. Use of the term “the UN” refers to the views of these contributing UN organisations unless otherwise indicated.

² MDG 7: Integrate sustainable development principles into country policies and programmes; reverse loss of environmental resources; achieve significant improvement in lives for at least 100 million slum dwellers

³ ‘Energy Services for the MDGs’, 2005, World Bank&UNDP
http://www.unmillenniumproject.org/documents/MP_Energy_Low_Res.pdf

⁴ Statement of the Secretary-General to the High-level meeting of the Commission on Sustainable Development, 9 May 2007

⁵ 9 March 2007 - Statement of the Spokesperson for the Secretary-General on climate change.

EU, mainly from developing countries. The rapid development of modern bioenergy worldwide clearly presents a broad range of opportunities, but it also entails many trade-offs and risks, particularly for developing countries. Given the crucial importance of the issue for developing countries and countries in transition, the UN welcomes this consultation process.

The UN calls on all parties in this consultation to devote the necessary attention to the specific needs of developing countries, in recognition of the importance of this issue in promoting sustainable development and in line with the EU's commitment to Policy Coherence for Development. The UN notes that a number of priority areas identified in the PCD policy as important to attain synergies with development policy objectives, have linkages to biofuels⁶.

The UN has sought below to respond to the development dimensions of all four proposed priorities of the EU energy strategy for transport namely: (i) improving the energy efficiency of all modes of transport, (ii) increasing the use of alternative and renewable fuels, (iii) promoting energy-conscious user behaviour, and (iv) promoting integrated transport systems in order to minimize energy use. The UN thinks that the latter points have the potential for major improvements in public health through reduced air pollution, providing opportunities for physical activity, improved social cohesion etc., both within Europe, and especially in providing a leadership example to rapidly developing countries.

There is clearly an opportunity for developing countries to further their development objectives through the export of biofuels providing their production is sustainable, i.e. that the following issues are ensured: Food security, respect of labour rights, environmental protection, health protection by reducing/avoiding pollution and ensuring freshwater supplies to the population, land management, and the development of their internal markets (e.g. local use of local production). These aspects need to be addressed jointly as they are all interlinked and all impact upon the central goal of reducing poverty. The conclusions of the April 2007 UN-Energy⁷ report 'Sustainable Bioenergy: A Framework for Decision Makers'⁸ underscore the many benefits that bioenergy provides in reducing poverty, improving access to energy and promoting rural development. The report calls for policymakers to take a holistic approach: "Only through a convergence of biodiversity, greenhouse gas emissions and water-use policies can bioenergy find its proper environmental context and agricultural scale". It highlights the fact that biofuels are more effective when used for heat and power rather than in transport, and suggests that greater emphasis should be placed on promoting research on the social, scientific, technological, economic, policy and environmental facets of bioenergy development. The UN Millennium Project Task Forces also provide in-depth reports⁹ with detailed analysis and recommendations on the different facets mentioned.

Given the differential impact on developing versus developed countries of energy policies, promotion of partnerships with the international community for information sharing on best practices as well as transfer technology should be enhanced, as the developing countries are themselves requesting¹⁰. The UN is mandated to facilitate this dialogue and can therefore be the forum where country partners could strengthen their cooperation.

By setting ambitious targets to tackle climate change, the EU committed itself to reduce its greenhouse gases emissions not only locally (European region) but also globally, which is a huge challenge. As Ban Ki Moon stated "Ambition and leadership are what is needed to respond to climate change, one of the greatest challenges facing humankind."¹¹ The UN stands ready to work with all country partners to find sustainable

⁶ "Policy coherence for developing: Accelerating progress towards attaining the Millennium Development Goals COM(2005) 134 final, 12.04.05. PCD Priorities: 1-trade, 2-environment/sustainable development, 4-agriculture, 6-social dimensions of globalisation, employment and decent work, 8-research and innovation, 10-transport, 11-energy.

⁷ UN-Energy is a collaborative framework for all UN bodies that contribute to energy solutions, which is born out of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa. (<http://esa.un.org/un-energy/>)

⁸ <http://esa.un.org/un-energy/pdf/susdev.Biofuels.FAO.pdf>

⁹ Hunger, Education, 'Child Health and Maternal Health', Environmental sustainability, Water and sanitation, Trade, 'Science, technology and innovation': <http://www.unmillenniumproject.org/reports/reports2.htm>

¹⁰ 30 April 2007 – UN CSD 15 – Permanent Representative of the Government of Pakistan to the UN Mr. Farukh Amil, speaking on behalf of the "Group of 77" developing countries and China, called for the provision of new and additional financial resources for development, equitable international trade and financial systems, and the transfer of technology.

¹¹ 9 March 2007 - Statement attributable to the Spokesperson for the Secretary-General on climate change.

solutions, through biofuels or other issues, which can contribute to the objectives of mitigating and adapting to climate change, achieving the MDGs as well as enhancing the development of the developing countries.

1. How should a biofuel sustainability system be designed?

For developing as well as developed countries, large-scale exploitation of biomass for energy and fuel uses requires integrated strategies that take into account all uses of biomass – energy, food, fuels and materials, and address sustainability issues. A biofuel sustainability system should take into account the three pillars of sustainability: environment including biodiversity, economy and social and cover the entire life-cycle, from feedstock production, collection, handling and storage to conversion to end-use for transportation, heat and electricity.

A sustainability system should be designed in a multi-stakeholder approach. Where possible, it should build on existing initiatives, both national and commodity based, and fit into an international system to ensure buy-in as well as reduce the administrative burden on countries. Analysis of principles and criteria used in existing schemes show a degree of overlap which should be built upon. For example, schemes such as the Forest Stewardship Council have demonstrated that certification processes are possible: it would be useful to assess the (additional) administrative burden using the experience of such existing schemes.

A biofuel sustainability system should ensure compliance with a number of sustainability principles and criteria. Principles to be taken into account include the following:

- negative GHG balance / carbon stock conservation
- biodiversity conservation / no destruction or damage to biodiversity / sustainable use of natural resources
- soil conservation / no soil degradation
- sustainable water use / no contamination or depletion of water
- air quality / no or reduced air pollution
- labour conditions / rights ensured according to international standards
- minimal impact on food prices / minimal competition with food production
- increased livelihoods of local populations
- minimal displacement / control and leakage

These principles need to be complemented by a set of criteria and indicators, each further qualifying the principle to allow adherence to be tracked. Producing and large countries would need to ensure that criteria are respected, hence monitoring, reporting and verification requirements would need to be developed. Non-compliance with one of the principles should lead to an exclusion of the contribution of the particular product from the biofuels blending target and avoidance of support to it through direct or indirect support/incentive schemes.

Due to their very nature, it will be easier to monitor and tackle direct environmental and social impacts with such a system than deal with indirect impacts, such as impact on food prices and leakage effects: there is a real risk, for example, of food crops being displaced to high biodiversity areas without any control mechanisms being applied. These risks must be addressed with measures that target land use control. Options are: mapping of current land use and biodiversity “hotspots” to establish a baseline¹² and introducing a charge for displacement risk; excluding production of biofuels from cleared forest land, and excluding lands adjacent to areas of exceptional biodiversity where expansion of biofuel feedstock production would be likely to add to existing pressures.

Legislative solutions can be inflexible and send signals to biofuel producers that may unintentionally or unknowingly exacerbate environmental and food supply problems. The time required to raise the alert about a food-related problem and then to react to the shortage itself can exacerbate low food stocks and high international prices, for example. As noted elsewhere in this document, there is need for a thorough analysis of the implications of implementing a binding target such as the 10% biofuels target by 2020 set for the EU member states.

¹² Some of this has been done, i.e. global database on protected areas by UNEP’s World Conservation Monitoring Centre

In the early stages, the UN suggests a variety of pathways be tested that can promote compliance with biofuel sustainability objectives, allowing corrections as experience in understanding the benefits and costs of different systems is gained. Among the available models and choices – codes of conduct, voluntary schemes, certification (the most challenging and expensive), bilateral agreements, and multi-lateral frameworks – priority should be given to flexibility and scope for incremental improvements. A more flexible certification system can also prevent the further costs on smallholders and developing countries that legislation might impose.

A flexible certification system could be one of the instruments within a regulatory framework where clearly defined commercial rules, incentives and taxes are in place to regulate the renewable energy market of products and services. This could allow developing countries to benefit from access to bioenergy markets notwithstanding the work they still need to do to establish the necessary policy environment, legal and institutional framework, infrastructure, capacity (for example local certification bodies) and service provision. There are non-biofuel examples such as Codex Alimentarius¹³ through which private “suppliers” can choose an established default value but follow stricter standards in order to benefit from entering new markets or enjoying a price premium.

The possible development of private bioenergy standards in response to renewable energy legislation, consumer concerns and as a means of competitive positioning have the potential to act as non-trade barriers to small-scale farmers and developing countries. As an alternative, the development of voluntary codes of conduct to guide national bioenergy legislation and facilitate renewable energy trade and use with the participation of international bodies should be encouraged.

A number of developing countries that have the potential to produce biofuels are also food insecure. This creates additional risks of land-use choices that prioritize financial or economic over food needs. Still higher levels of risk are likely to be found in those countries that are net fossil fuel as well as food importers. Therefore the UN recommends that developing countries exporting biofuels be encouraged to and supported in ensuring their food security first and foremost¹⁴. The UN recommends that the EU needs to ensure that its future measures on biofuels, and environmental measures in Europe in general, do not increase food insecurity in developing countries.

Ensuring food security is also an essential criteria for agrobiodiversity. This includes essential ecosystem services (e.g. pollination, nutrient cycling), as well as the diversity of genetic resources (e.g. ecosystem resilience, nutritional diversity). By limiting the system to “discourage [only] the conversion of land with high biodiversity value” as it is stated in the EC document, there is a risk this would be confined to protected areas or only areas of special interest. However, agricultural lands, and areas adjacent to agricultural lands are also of high value, especially for food security. Hence, a biofuels sustainability scheme should make explicit reference to agricultural biodiversity (see also Question 1.5 - Criteria 3 on land uses associated with exceptional biodiversity, which should be expanded, as areas of “exceptional” biodiversity are likely already protected).

In responding to sub-question 1.6 on how the term “exceptional biodiversity” could be defined in a way that is scientifically based, transparent and non-discriminatory, the UN offers the following elements for consideration:

- Nations recognise some sites of exceptional biodiversity by designating them as protected areas. A comprehensive global database¹⁵ on protected areas already exists.
- However, many sites of exceptional importance for biodiversity, either from a traditional conservation viewpoint or because of the ecosystem services that they provide, are not officially designated in this way.
- At the global scale, a range of maps delineating areas of exceptional biodiversity have been produced (see Brooks *et al.* 2006¹⁶ for a comparison), generally at a relatively coarse spatial scale. The large

¹³ The Codex Alimentarius Commission was jointly created by FAO and WHO to develop food standards, guidelines and related texts.

¹⁴ Millennium Goal 1 Target: Reduce by half the proportion of people who suffer from hunger, by 2015.

¹⁵ This database is hosted at UNEP World Conservation Monitoring Centre (<http://www.unep-wcmc.org/wdpa/>).

areas defined do not have an even coverage of “exceptional biodiversity”; and so would only be useful to focus on broad geographical areas of concern.

There are also more recent and developing sets of criteria for defining biodiversity including within certification processes. Four relevant examples are:

1. *Climate, Community and Biodiversity Alliance* standards¹⁷: These are specifically aimed at assessing and reducing the climate, community and biodiversity impacts of land-based climate change mitigation projects.
2. *Roundtable on Sustainable Palm Oil principles and criteria*¹⁸ – the two most relevant criteria state that new plantings since November 2005, should not have replaced primary forest or any area containing one or more High Conservation Values, and that planning should take into account the conservation of rare, threatened or endangered species and high conservation value habitats found within the plantation holding.
3. *High Conservation Value Forests* (Jennings *et al.* 2004¹⁹). This toolkit aims to promote the use of “high conservation value” definitions that were first created for the Forestry Stewardship Council certification process. The concept can be extended to consider high conservation value habitats in general. The criteria to be assessed include global significance of biodiversity contained, presence of large landscape scale forests, or of rare or threatened ecosystems, as well as value to local communities through ecosystem service provision.
4. *Key Biodiversity Areas* (Eken *et al.* 2004²⁰) – this method for identifying “sites where unique biodiversity must be conserved immediately” is being used by Birdlife International and other conservation NGOs.

New analyses using standard datasets are also possible. The EC’s Joint Research Centre (JRC) already sets an example for Africa, comparing the possible species composition of different protected areas with fire occurrence, vegetation condition, climatic data, and measures of agricultural expansion and population/transport infrastructure²¹.

With regard to biodiversity, there is a bias in the EC document towards “wild” or “natural” biodiversity and relatively little coverage of “managed” biodiversity such as in agricultural crops and production systems. This could also be reflected in the Sustainability criterion 3 which focuses on biodiversity. Examples include the introduction of new crops specifically for biofuel production at the cost of existing crops varieties. As regards “exceptional” biodiversity, the IUCN red lists could be considered the authoritative sources of scientific information.

Bioenergy is a labour intensive energy source. Depending on the scale of production (large scale plantations, or medium and small scale operations) and the degree of mechanisation (intensive agricultural practices), new employment opportunities could arise for unskilled workers. However, issues such as health (e.g. indoor and outdoor pollution, harmful fertilizers and pesticides), freshwater shortages, social equity and land tenure are important factors. Social impact assessments could be a useful tool to understand how a European target of 10 percent biofuels could affect land ownership, resource management and rural livelihoods in developing countries.

¹⁶ Brooks, T.M., Mittermeier, R.A., da Fonseca, G.A.B., Gerlach, J., Hoffmann, M., Lamoreux, J.F., Mittermeier, C.G., Pilgrim, J.D., Rodrigues, A.S.L. 2006. Global Biodiversity Conservation Priorities. *Science* 313 (5783):58-61.

¹⁷ <http://www.climate-standards.org/>

¹⁸ [http://www.rspo.org/resource_centre/RSP0%20Principles%20&%20Criteria%20for%20Sustainable%20Palm%20Oil%20\(final%20public%20release\).pdf](http://www.rspo.org/resource_centre/RSP0%20Principles%20&%20Criteria%20for%20Sustainable%20Palm%20Oil%20(final%20public%20release).pdf)

¹⁹ Jennings, S., Nussbaum, R., Judd, N., Evans, T. 2004. *The High Conservation Value Forest Toolkit*. Prepared by ProForest for WWF and IKEA Co-operation on Forest Projects.

²⁰ Eken, G., Bennun, L., Brooks, T.M., Darwall, W., Fishpool, L.D.C., Foster, M., Knox, D., Langhammer, P., Matiku, P., Radford, E., Salaman, P., Sechrest, W., Smith, M.L., Spector, S., Tordoff, A. 2004. Key Biodiversity Areas as Site Conservation Targets. *BioScience* 54(12):1110-1118

²¹ <http://www-tem.jrc.it/PA/index.html>

The UN also stresses the urgent need for further research on the realisation of the potential benefits of ethanol in reducing health impacts from air pollution, as a recent study²² showed that some fuel mixes could cause a net increase in deaths from air pollution, mainly through promoting higher ozone levels.

Products of biofuels combustion may indeed pose different (or additional) health risks than those known in relation to the fossil fuel combustion. Therefore the (wider) introduction of biofuels must be accompanied by the effective emissions reduction technologies, especially to eliminate emissions of particulate and gaseous pollutants. This is in particular relevant to the use of biofuels (wood or wood pellets) for household energy production, potentially resulting in a significant increase of health impacts of exposure to particulate matter. Since, at present, the evidence base for health risk assessment of biofuels replacing gasoline or diesel fuel is very scarce, the research on the hazardous properties of the biofuel combustion products should be developed.²³

²² Stanford News, 18 April 2007 regarding the mix being proposed for the US (15% ethanol) – <http://news-service.stanford.edu/news/2007/april18/ethanol-041807.html> - It might be too early to say how robust this finding is, or whether it will apply in other locations, or with different fuel mixes, but it is a fundamental question that needs to be looked at urgently for policy design.

²³ Petrol fuels blended with ethanol can reduce emissions of carbon monoxide and nitrogen oxides slightly and can reduce emissions of hydrocarbons more significantly. High ethanol content, however, results in higher emissions of unburned ethanol and aldehydes. The conversion rate of the three-way catalyst for unburned ethanol is low and, as a consequence, tailpipe emissions are high, while aldehydes are converted effectively. Also, bioethanol and blends with petrol and diesel fuel give rise to lower emissions of PM, benzene and 1,3 butadiene. It was observed that benzene emissions decrease with increasing bioethanol content in petrol. Moreover, the ozone formation potential seems to be lower in general than for emissions from petrol- or diesel-powered vehicles. Major disadvantages, however, are very high hydrocarbon evaporative emissions and increased formation of acetaldehyde. Compared with pure petrol-powered vehicles, formaldehyde emissions are reduced in petrol blended with bioethanol (He et al., 2003; Hsieh et al., 2002; Bucksch & Egeback, 1999).

2. How should overall effects on land use be monitored?

The value of ecosystem services – air, land and water – provide valuable benefits to human communities. The value of these services could be affected (both in Europe and overseas) by the expansion of the land base for producing biofuels. Using the Millennium Ecosystem Assessment framework, it would be useful to examine the value of existing services of the ecosystems that might be affected and to identify tradeoffs. Of particular concern would be land conversion to plantation production and forest conversion.

Land use changes will have potential impacts on biodiversity. In the EC consultation document, there is no mention of potential conflict arising from possible changes in land use or from competition for land use, nor is there mention of the impact of potential land use changes on a broader range of issues such as economic impacts (e.g. food prices), encroachment onto other land for agricultural production, effects of deforestation on biodiversity loss and on GHG emissions, food security and so forth. These issues need to be addressed.

A key tool to predict or foresee environmental and socio-economic impacts of land use and changes in land use is to conduct an Environmental Impact Assessment or Strategic Environmental Assessment.

To monitor both direct conversion of land use as well as potential leakage, land use histories, baseline rates of land use conversion, and scenario analysis have to be developed. Remote sensing surveys such as those being developed under GEOSS, e.g. by the EC Joint Research Centre, could be used to identify land cover histories, and to estimate baseline land cover conversion rates. Whilst land cover is not land use, land use can often be accurately inferred from land cover. There is a strong potential to jointly implement monitoring systems with those that would be required for monitoring reduced emissions from deforestation, currently in discussion under the UNFCCC.

Regular reports on how land use has developed as compared to the baseline and the estimated effect on overall land use of increasing biofuel use need to be provided. Where biofuels are produced on land previously used to produce agricultural goods or forest products, then an appropriate portion of the overall land use effect belongs to that production area.

3. How should the use of second-generation biofuels be encouraged?

Prospective “next” generation biofuels promise clear advantages over first generation biofuels, in terms of land-use efficiency and environmental performance. In proven cases of a second-generation biofuels system achieving an exceptional target of GHG reductions a higher subsidy could be considered, which would be favourable to “double accounting”. Second generation counting double for achieving the 10% target: the calculation to reach the target could be somehow differentiated between the first and the second generations, with a strong incentive for the second counted twice - once it has been proved that the second generation is indeed less harmful to the environment than the first generation.

Second generation fuels may offer the potential for some reduction in food security risks due to their higher energy yields and greater use of non-food feedstocks as compared with current biofuels. They also provide the opportunity to utilize a different group of plant and tree species, a point which has potential implications for the international agriculture research community as well as for the extension and communication services in developing countries. Their impact on biodiversity, compared to the first-generation of biofuels, must be analyzed carefully and taken into full consideration. More health assessments should also be carried out.

Second-generation biofuels should be encouraged through R&D and deployment support, with a clear sunset clause, and linked to certain additional considerations:

- There is potential for biodiversity benefits through specific changes in land use: for example, (i) use of farmland for relatively low intensity crops such as short rotation willow coppice; (ii) restoration of some tree cover on degraded tropical lands could restore some ecosystem service benefits, though short of full ecosystem restoration; (iii) potential for biofuels derived from low-input high-diversity mixtures of native grassland perennials, at least in North America²⁴.
- There are specific risks for biodiversity. The risk to biodiversity is potentially greater if all plant biomass is “grist to the mill”. Even in well-managed forests, the intensified extraction of wood for biofuel could lead to reduction in deadwood, increased use of annual increment (less selective removal), and more disturbance (greater loss of ecosystem services including soil carbon retention).
- From a carbon and soil management perspective, the diversion of crop residues and other biomass from soil inputs could disrupt traditional and organic production systems, causing “leakage” via additional GHG emissions in the agricultural sector.

It is also likely there will be a strongly commercial component involved in the production of second generation fuels which could shift land use patterns and affect both countries and rural communities that are currently benefiting from current biofuel production. The UN thus recommends a close ‘monitoring’ to help the developing countries to adapt themselves to this possible shift of the market and production.

²⁴ Tilman, D., Hill, J., Lehman, C. 2006. Carbon-Negative Biofuels from Low-Input High-Diversity Grassland Biomass. *Science* 314(5805):1598-1600

4. What further action is needed to make it possible to achieve a 10% biofuel share?

In line with earlier comments, the UN urges caution before the EC moves to an immediate 10 percent binding biofuel target across the EU, and supports the need for more careful analysis and research on its implications. In addition to flexible mechanisms for compliance with sustainability criteria, it may be worthwhile to consider a series of progressive legislated targets (e.g. 3% by 2012, 5% by 2015, 10% by 2020) whereby each level is conditioned upon achieving acceptable performances in the preceding target. The UN also recommend the following specific actions:

- Adapt fuel quality standards;
- Ensure cooperation between the auto industry and oil companies/ blenders on vehicle/fuel compatibility;
- Provide an incentive to the auto industry to produce and deploy vehicles that can run on higher blends.

The UN reiterates the importance of increasing energy efficiency. In transport this is essential because biofuels can only have an impact if the overall consumption of fossil fuels is reduced. For example, if the entire corn (maize) consumption of the United States were used for ethanol, it would only replace 12% of current petroleum use. Biofuels will be able to provide only a modest level of fossil-fuel displacement in the long term due to high land requirements.

Some 80% of greenhouse emissions currently emanate from urban areas. Sustainable urban development practices and planning therefore have a role to play in terms of creating an environment which favours public transport and other modes which are more fuel efficient than the car. There are also considerable medium and long term benefits that can accrue through promoting more compact and efficient city forms, thus limiting journey times and distances and increasing the viability of integrated transport opportunities. Furthermore, the encouragement of public transport vehicles that utilize sustainably produced biofuels can have a powerful demonstration effect and other sectors are likely to follow suit.

Correspondence regarding this UN contribution to be addressed to:
UNEP • Rue Montoyer 14 • B-1000 Brussels
Tel: +32-2-213.30.50 • Fax: +32-2-213.30.51 • e-mail: info@unep.be