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### UNIDO activities in the field of energy and environment

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### Note by the Secretariat

In accordance with rules 14 and 16, Sweden in its capacity as President of the European Union, along with the Group of 77, proposed the inclusion of this supplementary item on the provisional agenda. The present document provides background information on the subject.

## I. Introduction

1. Access to clean, affordable energy and a healthy, ecologically balanced environment are essential for sustainable development. The least developed countries are disproportionately affected by environmental degradation and lack of access to clean, affordable energy and environmental services. These issues are also intricately related to pressing global challenges such as climate change, loss of biodiversity and ozone layer depletion, which cannot be addressed by countries acting alone. The recently formulated UNIDO “Green Industry” strategy addresses these key challenges by assisting countries to strengthen their capacity at the global, national and community levels, by identifying and sharing best practices, providing innovative policy advice and linking partners through pilot projects that help developing countries build sustainable industries.

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## II. Background

2. Currently, many industries in developing countries use obsolete and inefficient technologies and operating practices. In today's developing world, industries use more material and energy than is required for production efficiency. Producers and consumers have also adopted patterns of production and consumption that do not take into account the planet's available resources, growing population and assimilative capacity for emissions. These are serious concerns for sustainable development, that require appropriate concepts to be developed and appropriate measures taken to address the situation.

3. Pressure to change this situation is also being applied by various stakeholders. First, at the enterprise level, successful global competition calls for the most efficient production with the lowest costs, the establishment of good industrial relations, improved working conditions, and the development of appropriately skilled human resources. Second, pressure is being applied by major lending institutions as well as investors to adopt performance standards on quality, environmental and social issues to encourage sustainable industrialization. Third, government policies are encouraging industries to adopt increasingly stringent environmental and occupational health and safety standards. If they meet these standards, industries can benefit from higher productivity and improved competitiveness and thereby, greater market access.

## III. Decoupling natural resource use and economic growth

4. Decoupling the use of natural resources from economic growth will be a key development challenge. Currently, the consumption of materials, water and energy, as well as the generation of waste and emissions, are increasing in step with economic activity. However, the planet's available resources and its assimilation capacity for emissions are limited. Unabated population growth adds to these difficulties. In the past, progress in decoupling emissions from economic growth has been slow. Most countries have experienced a relative drop in emissions relative to the gross domestic product (GDP) but absolute emissions are still rising.

5. International trends also show that the declines in energy or material intensities have not been sufficient to offset growing demand. Absolute levels of energy and materials consumption have also not declined. Therefore, the global challenge of the future is to decouple the consumption of natural resources from economic growth in absolute terms. This is the prerequisite for any sustainable industrial development and the long-needed growth of industrial production in developing countries.

6. Addressing this problem can be shown to be economically feasible. For instance, UNIDO's Montreal Protocol programme would have contributed to the phase-out of approximately 69,300 ozone-depleting potential (ODP) tonnes of annual consumption and production of ozone-depleting substances (ODS). Many ODSs, such as chlorofluorocarbons (CFCs) are potent greenhouse gases, and their phase-out has also significantly reduced carbon dioxide (CO<sub>2</sub>) equivalent emissions released into the atmosphere. This is both directly, through the replacement of CFCs, as well as indirectly, by energy savings gained through industry adopting

newer, more energy-efficient technologies. The total net climate impact of all of UNIDO's Montreal Protocol projects is estimated to be a reduction of around 359 million tonnes of CO<sub>2</sub> equivalent. The quality and quantity of products manufactured (including refrigeration systems and foam) was maintained and improved. This demonstrates that the decoupling of natural resources use from economic growth is economically feasible.

7. Access to reliable modern forms of energy, primarily electricity, is fundamental for all industrial activities and development. Without electricity, the creation and start-up of small workshops and small-scale industries is impossible. To date, 1.6 billion people in the world, primarily living in rural areas far from electricity grids, still do not have access to electricity. Renewable energy systems, such as windmills, biomass gasifiers, small hydropower stations and solar heaters, offer appropriate solutions for off-grid as well as for industrial applications.

## IV. Energy and development

8. Energy is at the core of global environmental and developmental challenges. Central to these challenges is the provision of a reliable and affordable supply of energy and its efficient use for both industrialized and developing countries. To this end, it is imperative that strong linkages between energy, environment and development be forged.

9. Energy access and energy efficiency are fundamental to transforming global energy systems in order to meet the challenges of climate change and low-carbon economic growth and development. As outlined in recommendations made by the United Nations Secretary-General Advisory Group on Energy and Climate Change (AGECC)<sup>1</sup> in November 2009, addressing climate change and eradicating energy poverty are not mutually exclusive endeavours. On the contrary, expanding access to modern energy services for the poor and promoting energy efficiency are among the most effective means of advancing the Millennium Development Goals (MDGs) and addressing climate change challenges simultaneously.

### Energy access

10. Energy access has been widely acknowledged as the missing MDG. Although the scale of poverty is closely linked to the lack of modern energy services in most developing countries, increasing the access of poor communities to energy has not received sufficient attention from the international community. More than half of the world's population living in rural and semi-urban areas still lacks access to modern forms of energy with about 2.5 billion people relying on traditional biomass for cooking and heating. About 2 billion people, representing almost 30 per cent of the world's population, have no access to electricity, with most of them living mainly in the least developed countries (especially in sub-Saharan Africa).

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<sup>1</sup> On 17 June 2009 the United Nations Secretary-General convened an advisory group to provide him with advice on energy issues critical to climate change challenges. The Advisory Group on Energy and Climate Change, which is chaired by the Director-General of UNIDO, comprises members drawn from the private sector, resource institutions, civil society and United Nations agencies.

11. As recommended at the International Energy Conference held at Vienna in June 2009, the key to addressing both the energy access and development needs of the world would be to set quantitative as well as qualitative goals for achieving energy access, and to identify opportunities for aligning the challenge of providing energy access more closely with smart policies, productive capacities and public-private partnerships. There is also a need to address the access issue in terms of ensuring energy justice, promoting inclusive growth and achieving energy development goals at the global level.

### **Energy efficiency**

12. In a recent study, the International Energy Agency (IEA)<sup>2</sup> points to the fact that nearly one-third of global energy demand and almost 40 per cent of worldwide CO<sub>2</sub> emissions are attributable to industrial activities. The bulk of these emissions are related to the large primary materials industries, such as chemicals and petrochemicals, iron and steel, cement, pulp and paper. If today's best available technologies and practices were deployed globally, industrial energy use could be reduced by 20-30 per cent. Yet, such savings would not be sufficient to offset the anticipated growth in demand for industrial materials, which in most sectors will double or triple over the next 40 years. Industrial CO<sub>2</sub> emissions will therefore continue to rise unless a wide range of new technologies are commercialized and deployed.

13. Industry and Governments will need to collaborate closely in order to develop, demonstrate and deploy the promising new technologies that have already been identified, and also to find and advance novel processes and technologies that will permit the CO<sub>2</sub>-free production of common industrial materials in the longer term. As the IEA report points out, bringing about this technology transition will not be easy. It will require both a change in policy implementation by Governments and an unprecedented investment in best practices and new technologies by industry. Engaging developing countries and their industries in this transition will also be vital, since most of the future growth in industrial production, and therefore CO<sub>2</sub> emissions, will happen in the developing world.

14. It is recognized that energy efficiency is also closely linked to energy access and development. For instance, energy-efficient technologies help industry to produce more output with less energy. This eases the problems regarding household energy access. Further, a transition to a carbon-free or low-carbon industry can be a competitive advantage that may result in industry relocation, accelerating development and economic activity in countries that develop in this direction.

### **UNIDO's strategic focus**

15. Given these global trends and the demands of Member States, the strategic focus of UNIDO's energy programme is on two key areas: (a) promoting the cleaner and more efficient use of energy by industry; and (b) facilitating productive activities (particularly in rural areas) through the provision of modern energy supplies based on renewable energy. Where industry is already established, UNIDO offers technical cooperation to industry and enterprises to become more sustainable

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<sup>2</sup> International Energy Agency, "Energy Technology Transitions for Industry — Strategies for the next industrial revolution", Paris, 2009.

in their energy use through energy efficiency measures, including systems optimization approaches, and by supporting the strengthening of international and national energy management standards. UNIDO is also making businesses and enterprises more sustainable by helping them switch to energy produced by cleaner fuels, such as renewable sources of energy.

16. UNIDO is also facilitating productive activities with particular focus on agribusinesses in rural areas through the provision of modern energy supplies based on renewable energy. One of the emerging niche areas for UNIDO interventions is to promote renewable energy technologies for industrial applications in energy-intensive manufacturing small and medium enterprises, which have requirements for motive power and process heat for low or high temperature applications. This approach is closely linked with UNIDO's twin objectives of improving industrial competitiveness and promoting energy access for productive uses in rural areas, while at the same time helping to protect the environment through low-carbon energy technologies.

17. To maximize the impact of its energy programme, together with its partners, UNIDO is designing both country-level projects and the large coherent "umbrella" programmes that deepen programmatic approaches in order to harness the huge potential of energy efficiency and renewable energy. A good example is the strategic programme on energy for the countries of West Africa, which has been developed by UNIDO in partnership with the Global Environment Facility (GEF) and other agencies. UNIDO's concerted efforts over the past two years to scale up energy efficiency and renewable energy projects in developing countries (in terms of both quality and effectiveness) are now showing concrete results. Technical cooperation delivery under the Organization's energy and climate change portfolio has increased to \$12.6 million (forecast) in 2009 from \$6.8 million in 2008, and is likely to reach \$50 million in the 2010-2011 biennium.

18. UNIDO is an active member of two important global partnerships<sup>3</sup> on energy: UN-Energy<sup>4</sup> and the Secretary-General's Advisory Group on Energy and Climate Change (AGECC). As a part of the strategy to promote partnerships and global dialogue, UNIDO, together with UN-Energy and other partners, has successfully organized a number of global forums in the field of sustainable energy over the past three years, which have helped to strengthen the global dialogue on key energy issues, promoted United Nations system-wide coherence and the integration of the energy agenda, and helped to create synergies that have resulted in concrete projects and programmes at the national, regional, and local level.

### **Helping to shape the future**

19. To strengthen the linkages between energy and development, a future global energy road map will need to rely on the development and implementation of concrete measures based on: (a) universal access to clean, modern and affordable energy, and (b) scaling up the implementation of energy efficiency measures in both the demand (end-use) and supply of energy services, and actions by Governments

<sup>3</sup> The Director-General of UNIDO, chairs both global energy partnerships: UN-Energy and the Secretary-General's Advisory Group on Energy and Climate Change (AGECC).

<sup>4</sup> UN-Energy is the coordinating mechanism for energy-related activities within the United Nations system, and comprises 21 agencies including the World Bank and GEF.

and businesses focused on prioritizing cost-effective emission reduction opportunities.

20. Industry of 2050 will look very different. A new industrial revolution is required to end carbon-dependency and launch economies on a path to clean and stable development. Greater international cooperation supported by new and additional financial resources and based on public and private partnership is required to make sure that this transition is truly global and inclusive.

## **V. Green industry approach**

21. UNIDO's green industry approach is an extensive strategy addressing specific issues such as resource efficient and cleaner production, energy efficiency, renewable energy for industrial applications, water and waste management. The strategy emphasises the ability to "produce more with less". There are a number of important reasons to promote green industries to become resource efficient and low-carbon. This would help to decouple consumption of natural resources and release of emissions from industrial growth but would also increase industry's productivity, encourage the creation of new industries, allow greater access to global markets, and create jobs that support environmental improvements and resource efficiency. Progress through this approach can lead to sustainable and equitable poverty reduction.

22. Greening industry involves a commitment to reduce the environmental impacts of its processes and products through resource efficiency on a continuous basis. This approach is the core of UNIDO's resource efficient and cleaner production programme. The updated joint UNIDO-UNEP programme defines the outcomes and activities for the existing 43 National Cleaner Production Centres (NCPCs) and programmes, the start-up of 15 new centres and the implementation of several thematic projects in the next five years.

23. Furthermore, UNIDO offers technical assistance and capacity-building in a number of areas, including environmentally sound management and disposal of polychlorinated biphenyl (PCB) stockpiles, the introduction of best available techniques (BAT) and best environmental practices (BEP) to the industrial sector, the management of contaminated sites, the formulation of environmentally friendly biopesticides as an alternative to persistent organic pollutants (POPs) and bioenergy technologies as well as the use of agricultural residues and waste for energy production. To ensure effective cooperation and collaboration in these activities, UNIDO involves its existing institutional network of NCPCs, Investment and Technology Promotion Offices (ITPOs), field offices, and BAT/BEP global forums.

24. The transfer of environmentally sound technologies (TEST) is an integrated approach used by UNIDO to support industries to maximize productivity through sound management practices and promoting zero discharge. The main aim of this approach is to integrate a win-win strategy into enterprise operations, through process optimization, best management principles and the minimization of non-product outputs. This approach has proven to be effective in assisting industries, particularly in water management.

25. The UNIDO International Centre for Hydrogen Energy Technologies (UNIDO-ICHET) initiates and supports the demonstration of hydrogen energy technologies to facilitate the widespread use of this sustainable energy source in developing countries and countries with economies in transition. ICHET also seeks to implement a variety of applied research projects, as well as applied research and development projects specifically designed to encourage the involvement of small and medium enterprises (SMEs). The expertise needed for these projects is shared and taught through workshops and seminars and it is hoped that this will help to stimulate the application of hydrogen energy technologies in developing countries.

26. The objective of the UNIDO China Motor System Energy Conservation Programme is to assist the Government in controlling the growth of greenhouse gas emissions and to preserve energy. Industrial motor systems are a major user of electricity in China, accounting for more than 50 per cent of overall electricity use. UNIDO has established a methodology to promote efficiency improvements in factories throughout the country. It has also trained local experts to implement these measures. Within two years, 38 industrial plant assessments were conducted and nearly 40 million kilowatt-hours (kWh) in annual energy savings identified.

27. The issue of technology transfer to developing countries is a key part of UNIDO renewable energy activities. Low-carbon technologies are central to meeting the challenges of sustainable development and are considered to be a positive response to the dangers posed by climate change. In this context, a project has been designed to establish an online knowledge management platform on biomass conversion technologies. It will start operation in 2010. The platform will provide information on commercially available bioenergy technologies, suppliers, environmental and economic data, and success stories. The database is complemented by a bioenergy training package that seeks to inform policymakers and enterprise practitioners in technological, policy, socio-economic and financial subjects. It will also provide detailed training for industry representatives in the coffee, cocoa, rice, sugar, wood, palm oil and vegetable and food-processing industries.

28. At the country-level, UNIDO assists Governments in testing technologies that meet local needs and conditions. For example, in the United Republic of Tanzania, the UNIDO renewable energy project has supported a small community without access to the electricity grid in setting up a hybrid biogas and solar energy system to enhance local productive activities, thereby creating jobs and adding value, thus contributing to poverty reduction. In Rwanda, a mini-hydro plant has been built with UNIDO support and is being operated by the local community, creating employment and promoting productive activities in a remote area. In this context of developing demonstration projects, UNIDO has been engaged by the Global Environment Facility (GEF) to design projects in 18 West African countries focusing on three areas: energy access, energy efficiency and renewable energy.

29. UNIDO also supports the reduction of costs and risks to the environment through the correct use of chemicals in industry and proper management of waste. An activity that UNIDO supports is chemical leasing in industries, which is a service-based business model to supply auxiliary chemicals to businesses. The aim is to achieve environmentally sound management and reduced use of toxics and chemical wastes. The model is applicable to a wide range of auxiliary chemicals, such as paints and solvents, oils and lubricants. An international policy framework

to foster the sound management of chemicals, known as the strategic approach to international chemicals management (SAICM) has been developed. UNIDO supports countries with their implementation of the SAICM principles through capacity development, institutional strengthening and policy advice (reference: decision GC.12/Dec.17).

30. The targets for a low-carbon future have become more prominent within the Montreal Protocol. The implementing agencies of the Montreal Protocol are focusing on integrating Kyoto Protocol concerns and issues within their future project implementation plans. The United Nations Multilateral Fund Secretariat has called on all implementing agencies to investigate additional means of financing future challenges by securing funds related to the low-carbon potential of their projects. UNIDO is currently working on strategies to deal with the challenge of destroying ODS stockpiles, destruction of ODS-containing equipment, and the phase-out of hydrochlorofluorocarbons (HCFCs). The clean development mechanism of the Kyoto Protocol is being considered for these programmes. Methodologies are also being tailored to suit the requirements of both the Montreal and the Kyoto Protocols. For example, UNIDO has initiated actions to facilitate synergies between the two Protocols in its chiller replacement projects. In this context, UNIDO has forged a new partnership with the French Global Environment Facility (FGEF) for the implementation of a regional chiller replacement project in Africa, whereby FGEF has provided funds specifically for the climate change component of the project.

31. Ultimately, the current status of the global environment requires countries to share skills, best practices, technologies and methods in resource efficiency in order to reduce global poverty and for industrial development to be sustainable.

## **VI. Action required of the Conference**

32. The Conference may wish to take note of the information provided in the present document.

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