Reforming Energy Subsidies

Opportunities to Contribute to the Climate Change Agenda

United Nations Environment Programme

Division of Technology, Industry and Economics

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Foreword

Greenhouse gas emissions, primarily caused by fossil fuels, are the main drivers of climate change. Through the Intergovernmental Panel on Climate Change, the international community agreed that global greenhouse gas emissions need to be halved relative to 1990 by 2050 to avoid irreversible and possibly catastrophic changes for millions of people. These impacts include endangered water and food security, widespread melting of glaciers and dramatic rises of sea-levels threatening entire populations.

Nevertheless, many governments continue to subsidise the use of fossil fuels. In recent years, some have even intensified their financial support for social reasons to compensate for the steep increase in international oil prices. However, such subsidies often do not reach those that they are intended for. They are also very costly in economic terms, creating a large drain on government budgets and distorting national and international markets. On the other hand, energy subsidies can be beneficial, where they are aimed at promoting cleaner and more efficient technologies and at improving poor households' access to modern forms of energy.

Some countries have already taken steps in assessing their subsidies programmes in terms of their environmental, social and economic impacts and in reforming their harmful policies. However, much greater national and international efforts are indispensable to reduce those subsidies that enhance fossil-fuel use and thus act as a hurdle to combating climate change and achieving more sustainable development paths.

With this booklet, UNEP aims to raise awareness of the various types of energy subsidies, their size and impact and the direct relationship with climate change and sustainable development. I hope that the key policy lessons and recommendations in this booklet will help policy makers to design reform of energy subsidies in an environmentally, socially and economically sound manner. With this guidance document, I am calling on you to help us tackle the problem of climate change by using your resources wisely and stop investments in energy practices that have proved to be detrimental to the environment, development and society as a whole.

Achim Steiner
Executive Director
United Nations Environment Programme

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Introduction

Reforming environmentally harmful energy subsidies will need to play a central role in moving the world onto a more sustainable development path. Consensus on the detrimental impact of rising fossil-energy consumption on climate change now calls for renewed attention and urgency of the reform process. However, there is a lack of information and understanding about the size of the problem, the need for policy reform and the best way to go about it.

This report summarises, in non-technical language, the issues and challenges in removing or modifying subsidies on energy that undermine the pursuit of sustainable development. It updates the first edition, published jointly by the United Nations Environment Programme (UNEP) and the International Energy Agency (IEA) in 2002, drawing on the findings of recent work related to energy subsidies by various organisations.

This report was commissioned by the Division of Technology, Industry and Economics of UNEP. Trevor Morgan of Menecon Consulting (now with the IEA) was the principal author. The report also benefited from comments and suggestions from a panel of external reviewers, including Florian Ziegler of Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and Ron Steenblik of the International Institute for Sustainable Development (IISD). Their help is gratefully acknowledged.

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For more information about UNEP's current and past work on energy subsidies, please visit: http://www.unep.ch/etb/areas/energySub.php.

Energy, Climate Change and Sustainable Development

"Sustainable development" has become a guiding principle for public policy. But translating that principle into practical policies and measures can be difficult, not least because of the complex inter-relationships that exist between the interests of present and future generations and between the three dimensions of sustainable development – the economy, social welfare and the environment. Energy is implicated deeply in all three dimensions. It is essential for economic and social development. But current energy systems harm the environment in lots of ways, notably by contributing to climate change.

The Role of Energy in Sustainable Development

A lack of access to reliable and affordable energy is holding back economic and social development in many parts of the world today.

Energy is essential to all economic activities and to human well-being. Economies rely on commercial energy to transport goods and people, to heat homes and offices, to power engines and appliances, and to run shops and factories. Energy services help to meet basic human needs such as the production of food, the provision of shelter and access to health services, while contributing to social development by enabling education. Lack of access to reliable and affordable modern energy is holding back economic and social development in many parts of the world today. An estimated 1.6 billion people in the world have no access to electricity, while more than two billion people rely on traditional fuels for cooking and heating. Raising their living standards and productivity depends on improving their access to modern energy services.

However, patterns of energy production and use around the world still threaten the stability of eco-systems and the health and well-being of current and future generations. Rising consumption of fossil fuels – coal, oil and gas – in all regions is the leading cause of rising man-made emissions of carbon dioxide and other greenhouse gases that trap heat in the earth's atmosphere. The resulting increase in atmospheric concentrations of these gases is threatening to cause catastrophic and irreversible damage to global climate. The Intergovernmental Panel on Climate Change (IPCC), in its 2007 *Fourth Assessment Report*, presents unequivocal evidence that rising concentrations have already led to an increase in average global temperature, estimated at around 0.7°C compared with pre-industrial levels. Global warming is expected to lead to accelerated melting of ice and snow, rising sea levels and profound changes in weather patterns. The economic and social consequences are potentially disastrous.

Burning fossil fuels also causes urban smog and acid rain, while producing them can pollute water supplies. In many towns and cities, local pollution

caused by burning oil, gas and coal in houses, factories, cars and power stations is a leading cause of human health problems. Concentrations of the main local air pollutants – particulates, sulphur dioxide and nitrogen oxides – in the big cities of many developing countries are well above World Health Organisation maximum guideline levels. Acidification of lakes and soils is also a big problem in many parts of the world.

However, environmental problems are not limited to fossil fuels. Nuclear power production gives rise to radioactive waste and the risk of contamination. And even the production of certain types of renewable energy can have severe environmental consequences, such as the ecological effects of hydroelectric dams or toxic heavy metals used in batteries for solar home systems.

Energy use worldwide is expected to continue to grow steadily for the next two decades and, in the absence of radical intervention by governments, fossil fuels will remain the dominant energy sources. The latest *World Energy Outlook* of the International Energy Agency (IEA) projects global primary energy consumption to expand by 55% between 2005 and 2030 in a Reference Scenario, which assumes no new government policies. Fossil fuels account for 84 per cent of the increase in energy use (Figure 1). As a result, energy-related emissions of carbon dioxide rise by 57 per cent. Most of the increase in energy demand and resulting emissions is projected to occur in developing countries, especially in the emerging economies of China and India.

Figure 1: **World Primary Energy Supply (Mtoe)**