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ENERGY SUBSIDY REFORM AND SUSTAINABLE DEVELOPMENT: CHALLENGES FOR POLICYMAKERS

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ENERGY SUBSIDY REFORM AND SUSTAINABLE DEVELOPMENT: CHALLENGES FOR POLICYMAKERS

SYNTHESIS REPORT

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Conclusions and Recommendations

The Need for Energy Subsidy Reform

- *Energy subsidies have often not met their goal of furthering national economic and social development. Prices that do not reflect production and supply costs lead to an inefficient allocation of resources and market distortions.*
- *Reform of energy subsidies – especially those that encourage fossil fuel consumption – together with rational taxation structures and other policy initiatives could in many countries steer their development onto a more sustainable path.*
- *The overriding objective of subsidy reform should normally be to reduce their overall size. Social policy goals – the main rationale for many subsidies – are often better served through alternative mechanisms, such as direct financial transfers to poor households.*
- *There may nonetheless be a good case for retaining subsidies in specific instances, especially where they are aimed at encouraging more sustainable energy use. Examples include temporary support for new renewable and energy-efficient technologies to overcome market barriers, and measures to improve poor or rural households' access to modern, commercial forms of energy without encouraging excessive consumption.*

The Design and Implementation of Reform

- *Designing and implementing energy-subsidy reform in practice must take account of national circumstances and trade-offs between social, economic and environmental effects. Where subsidies make sense, they should be designed to reach intended recipients only. Subsidy programmes should be pragmatic and transparent.*
- *Public resistance is often a major obstacle to reducing or removing subsidies. For this reason, great care and analysis is needed and caution must be exercised when subsidies are proposed in the first place. Reform also needs to be implemented in a gradual, programmed fashion to alleviate the financial pain of those who stand to lose, give them time to adjust their energy production, supply and consumption patterns, and to allow time for alternative policy mechanisms to take effect.*
- *Where subsidies remain, it is essential that their costs and benefits be effectively monitored to ensure that the rationale for them remains valid. Effective action is also needed to prevent or limit abuse and ensure that subsidies are restricted to targeted categories.*

Key Regional Issues

- *Direct energy subsidies have in general been declining in* ***OECD countries****, but there remains scope for further reforms – notably to reduce subsidies that favour fossil-fuel use. In addition, much remains to be done to evaluate environmental impacts of indirect subsidies that induce fuel consumption.*

- *Efforts in **transition economies** need to focus on raising energy prices to market levels and improving collection rates: non-payment of energy bills constitutes a major source of implicit subsidy.*
- *For **African countries**, the challenge is to structure subsidies to alleviate poverty and raise living standards by improving access to modern forms of energy in an environmentally acceptable and financially viable way.*
- *In **Asia**, the recent financial crisis and surge in international oil prices, which have led to higher end-user prices and put enormous strain on government finances, have heightened the necessity for a move to more market-based energy pricing while highlighting the need for continued support to poor people.*

1. Why this Report

At the March 2000 first meeting of the Ad Hoc Open-ended Intergovernmental Group of Experts on Energy and Sustainable Development (which is helping governments prepare for the ninth session of the UN Commission on Sustainable Development, CSD-9), the subject of how energy subsidies influence sustainable development figured prominently in the discussions. More generally, developing countries also expressed concern over the lack of regional consultations. The IEA and UNEP responded by offering to conduct further analytical work in this area and to organise jointly a series of regional workshops where energy subsidy and sustainable development issues could be discussed.

The analytical work, which built on a substantial amount of analysis of energy subsidies by the IEA and UNEP over the last few years[1], involved in-depth studies of several countries, including India, Venezuela, Korea, Chile and South Africa, and the OECD overall[2]. These studies, which reviewed the size and impact of energy subsidies, the possible effects of subsidy removal and potential policies to reform subsidy systems, provided a basis for discussions at the regional workshops. These were held in Paris, France on 6-7 November 2000, Durban, South Africa on 15-16 December 2000 and in Bangkok, Thailand on 16-17 January 2001. A fourth workshop will be held in Santiago, Chile on 27-28 March 2001.

The primary objectives of the workshops were to:

- Further the dialogue between developed and developing countries on energy subsidies and their environmental, social and economic effects.
- Provide a platform for dialogue at the regional level, involving representatives from government, NGOs, research institutes and industry to exchange views and ideas on specific regional issues and policies relating to energy subsidises and their reform.

[1] This includes a major IEA study, *World Energy Outlook Insights, Looking at Energy Subsidies: Getting the Prices Right* (Paris: 1999), which examines the extent to energy is under-priced in several of the largest non-OECD countries and the potential reductions in energy use and energy-related CO_2 emissions that could be achieved by removing subsidies.

[2] The IEA and UNEP plan to publish these studies as a compendium, along with this synthesis report, in 2001.

- Raise awareness and enhance understanding of fossil fuel subsidies.
- Review and build on methodologies to identify and assess the amount as well as the impacts of energy subsidies and their reform.
- Enhance the capability of governments to design and implement energy-subsidy reform.

The project was financed by voluntary contributions from Austria, Canada, Denmark, Germany, the Netherlands, Sweden, Switzerland and the United Kingdom. This report, a formal submission to UNCSD-9, summarises the key issues discussed during those workshops and the principal conclusions and recommendations resulting from them. Summary reports on all of the workshop discussions are contained in the annexes to this document. More detailed information and presentations at the workshops are available at www.iea.org and www.uneptie.org/energy.

2. What Energy Subsidies are, Why they Exist and how Big they are

Definitions

Determining what constitutes a subsidy is critical to any analysis of the implications of energy subsidies for sustainable development. No consensus definition exists, making comparisons of individual studies of specific countries or regions difficult and complicating objective discussion of issues relating to subsidies and their reform. The narrowest and perhaps most commonly used definition is a *direct payment by a government to a producer or consumer.* Broader definitions attempt to capture other types of government interventions that affect prices or costs both directly and indirectly. For example, a 1998 OECD study defined subsidy in general terms as *any measure that keeps prices for consumers below market levels, or for producers above market levels, or that reduce costs for consumers and producers*[3]. In a similar way, the IEA recently defined energy subsidies as *any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers*[4].

The assumed baseline level of costs and prices is crucial, whatever the chosen definition. The assumption of market costs and prices as suggested by the above definitions implies that any attempt by a government to address market failures by reducing the price or cost of energy to internalise an external environmental or social benefit (i.e., a positive externality) would constitute a subsidy. On the other hand, if baseline costs and prices are assumed to take account of external costs and benefits (i.e., they are economically optimal), a failure by the government to address a market failure involving an external cost could be considered a subsidy. In practice, assessing quantitatively the magnitude of externalities is extremely difficult so empirical studies of subsidies often use a conventional definition that assumes market prices and costs.

[3] OECD, *Improving the Environment Through Reducing Subsidies* (Paris: 1998).
[4] IEA (1999).

An operational definition of energy subsidy also has to take account of the scope of government interventions. Many non-energy government policies and measures may unintentionally lead to lower energy prices in an indirect way. Government actions that primarily concern the transport sector, for example, can significantly affect the cost and price of providing an energy service. Taxes must also be taken into account in any quantification of subsidies and their effects since they offset the effect of subsidies on price. In many cases, energy subsidies are more than offset by special taxes and duties that raise the final end-use price to above market levels. Differential rates of taxation can give a competitive advantage or disadvantage to one fuel or energy form over another in the same way as a subsidy.

Types of Energy Subsidy

There are many different types of energy subsidies. The following interventions, which may constitute sources of subsidy to producers or consumers, are the most common:

- Direct financial interventions, such as:
  - Transfers, grants, preferential loans and liability insurance.
  - Tax instruments, including royalties, duties, levies, tariffs, credits and relief, accelerated depreciation allowances and the possibility of transfer pricing.
- Indirect administrative interventions, including:
  - Trade instruments, such as quotas, technical restrictions and embargoes.
  - Government management and ownership of energy assets, including public agencies performing service functions, energy infrastructure and public energy R&D.
  - Regulation of the energy sector, such as demand guarantees, negotiated target-setting and mandated deployment rates, price controls, environmental regulations, technical standards, market-access restrictions, licensing and certification.

The interventions listed above are classified according to whether they impact prices or costs directly or indirectly. Subsidies may be classified in other ways, such as whether the subsidy is on- or off-budget, or whether the subsidy accrues to producers or consumers.

Why Governments Subsidise Energy

Subsidies to any economic activity can in principle be rationalised on the basis of theoretical arguments concerning market failure or imperfections that lead to economically sub-optimal outcomes, and on the basis of social and environmental policy considerations. The challenge for policymakers in practice is two-fold: to find the appropriate balance between reliance on the market and intervention to address social and environmental policy goals, and to find workable mechanisms that ensure that stated policy goals are met.

Market failures include the inability of the market to price public goods, which are owned by and accessible to everyone, and barriers to market entry that impede the efficient operation of the market. Air is an example of a public good: governments have a responsibility to intervene to protect air quality by regulating emissions since individual polluters would otherwise not pay for the environmental damage. This damage is a cost that is external to the market place – i.e. an external environmental cost or externality. Levying charges on polluting activities is one way of

effectively internalising these externalities. Subsidising less or non-polluting activities can achieve similar end-results: if taxes are the stick, then subsidies are the carrot. Barriers to market entry can also constitute a justification or rationale for subsidising a particular energy source or technology. For example, the high up-front cost of developing cleaner technologies and the associated technical and financial risks may deter investors. Government subsidies can help to compensate for this and thus encourage investment.

Government intervention, which may involve the use of subsidy, is intended to remedy such market failures, either by addressing their causes or by trying to replicate the outcome of a perfect market. Social considerations such as concern for the poor, sick or otherwise disadvantaged, may also provide a rationale for subsidising energy. Most governments consider that access to a reasonably priced minimum supply of modern energy services is socially desirable.

In practice, all energy-subsidy programmes are ultimately justified on one or more of the following grounds:

- To protect employment in a particular indigenous industry or sector against international competition or promote job creation.
- To stimulate regional or rural economic development.
- To reduce dependence on imports for energy-security reasons.
- To lower the effective cost of and/or provide access to modern energy services for specific social groups or rural communities as a means of welfare support.
- To protect the environment.

Subsidy programmes are often designed to support several of these objectives simultaneously. Subsides designed to support employment and regional development, to reduce energy import dependence and, in some case, to contribute to environmental protection usually involve protection of indigenous energy industries.

Subsidies to indigenous production remain common throughout the world, but have generally been declining in most countries over the last decade with the shift towards more market-oriented economic and energy policies and liberalisation of international trade. Subsidies to coal producers, for example, while still big in several countries including a handful of OECD countries, have fallen sharply in recent years. On the other hand, subsidies to encourage the development and deployment of renewable energy sources are rising, driven mainly by local, regional and global environmental concerns and, in some cases, by regional employment objectives. For example, several OECD and non-OECD countries subsidise the production of fuels derived from agricultural products. These subsidies are often aimed at protecting farming jobs and incomes as well as contributing to better air quality and combating climate change – to the extent that the production and use of such fuels involve lower full fuel-cycle emissions of noxious and greenhouse gases.

In many developing countries and transition economies, energy subsidies are used to keep end-user prices below market levels for social welfare reasons. In most cases, energy subsidies are intended to help redistribute income to poor people, although it is often richer people that benefit most. Subsidies may also be used to help poor people afford modern forms of energy such as electricity, kerosene and liquefied petroleum gas (LPG) that would otherwise be too costly. Helping poor communities in developing countries gain access to such fuels is a key element in promoting

regional and rural sustainable development, supporting education discouraging deforestation and improving safety and health, as they often replace firewood and animal waste.

Current Scale of Energy Subsidies

Energy subsidies are widespread and diverse but vary greatly in importance and type among sectors, countries and regions. Estimates of their size depend on definitions and methodologies. Very few studies have attempted to quantify subsidies for the world as a whole because of data deficiencies and the sheer scale of the exercise. The most prominent global study, carried out by Larsen and Shah at the World Bank in 1992, put total global fossil fuel subsidies to consumption alone through under-pricing at around US$230 billion per year[5]. The Former Soviet Union countries accounted for around two-thirds and other non-OECD countries for most of the rest. An OECD study the same year estimated net global consumption subsidies at US$235 billion per year, with US$254 billion of subsidies in non-OECD countries offsetting US$19 billion in net energy taxes in the OECD[6].

Other more recent studies suggest that energy subsidies are much bigger in non-OECD countries. The World Bank estimated annual subsidies in 1997 measured in consumer subsidy equivalent terms at US$60-70 billion outside the OECD[7]. The 1999 IEA study, which examined eight of the largest non-OECD countries covering almost 60% of total non-OECD energy demand, found that end-use prices were approximately 20% below market levels – close to the World Bank study's estimate for the whole of the non-OECD region. The total value of energy subsidies in those sectors covered by the study amounted to around US$95 billion in 1998.

Various studies have demonstrated that gross energy subsidies in OECD countries are generally much smaller than in developing countries and the transition economies and, in most countries, are more than offset by taxes. For example, the 1998 OECD study estimates that member countries' energy subsidies amounted to US$19-24 billion per year. The bulk of these go to oil and coal producers, although the nuclear industry receives significant sums mainly through support to R&D. The results of a US Government study completed in 2000 are broadly in line with those of the OECD study: total US federal subsidies to the energy sector were estimated at US$6.2 billion in 1999[8]. But other studies carried out by NGOs have produced significantly larger estimates. For example, a 2000 study by Koplow and Martin estimates the cost of US federal subsidies to the oil industry alone at US$5.2-11.9 billion in 1995[9]. As in every other OECD country, however, gross

[5] Larsen and Shah, *World Fossil Fuel Subsidies and Global Carbon Emissions*, Policy Research Working Paper Series 1002, (Washington: October 2000).
[6] Burniaux, Martin and Oliveira-Martins, *The Effects of Existing Distortions in Energy Markets on the Cost of Policies to Reduce CO_2 Emissions: Evidence from GREEN*, OECD Economic Studies (Paris: Winter, 1992).
[7] Cited in Pearce and Finck von Fincklestein, *Advancing Subsidy Reform: Towards a Viable Policy Package*, in *Finance for Sustainable Development: Testing New Policy Approaches*, Background Paper 15, UN CSD 8th Session (24 April – 5 May 2000).
[8] US Department of Energy/Energy Information Administration, *Federal Energy Market Interventions 1999* (Washington: 1999 and 2000).
[9] Koplow and Martin, *Fuelling Global Warming: Federal Subsidies to Oil in the United States*, commissioned and published by Greenpeace (Washington: 2000).

subsides to the oil industry are significantly lower than taxes. In 1998, special taxes on oil product sales alone in the United States amounted to more than US$35 billion[10].

The form of subsidy varies markedly between industrialised and developing countries and transition economies. Producer subsidies are most common in OECD countries, while the bulk of subsidies in developing countries and transition economies are to consumers – usually through price controls that hold end-user prices below the full cost of supply[11].

3. How Energy Subsidies can go Wrong

Economic Costs

Whatever definition is used, a subsidy by its very nature involves a shift in economic resource allocation through its effect on costs and/or prices. Unless the subsidy is successful in correcting a market failure, it will inevitably result in a sub-optimal economic outcome and a loss in economic efficiency. In that case, the subsidy can only be justified if any gain in social welfare or environmental improvement is judged to exceed the economic cost.

In reality, energy subsidies often fail to meet their objectives. In other words, they fail either to correct specific market failures or to achieve sufficiently large benefits in social welfare terms to outweigh the loss of economic efficiency. Quantifying these costs and benefits is extremely difficult and judgmental. Nonetheless, there are numerous examples from different countries and regions of the ineffectiveness of energy subsidies in addressing social policy goals and the high costs associated with them. The 1999 IEA study, for example, estimated the net present value of the loss of economic growth due to consumer energy subsidies in the eight countries covered at US$257 billion using a discount rate of 7%.

Depending on the type and form of subsidy, the loss of economic efficiency may be reflected in one or more of the following ways:

- To the extent that they reduce the prices received by producers, subsidies undermine energy providers' return on investment and, thus, their ability and incentive to invest in new infrastructure. They may tend to encourage reliance on lower cost, less modern technology. Equipment suppliers will also invest less in technology research and development since the return on investment is lower than it would otherwise be.
- Subsidies to consumption and/or production, by lowering end-use prices, lead to higher energy use and reduced incentives to conserve or use energy more efficiently.
- Subsidies to producers, by cushioning them from competitive market pressures, tend to reduce incentives to minimise costs, resulting in less efficient plant operation and sub-optimal investment.

[10] IEA, *Energy Subsidies in OECD Countries* (Economic Analysis Division Working Paper, Paris: 2000).
[11] Markandya, *Energy Subsidy Reform: An Integrated Framework to Assess the Direct and Indirect Environmental, Economic and Social Costs and Benefits of Energy Subsidy Reform*, Working Paper prepared on behalf of UNEP, Division of Technology, Industry and Economics (December 2000).

- Direct subsidies in the form of grants or tax revenues foregone act as a drain on government finances. In the long run, indirect subsidies that reduce economic growth also lead to lower government revenues.
- Price caps or ceilings below market-clearing levels may lead to physical shortages and a need for administratively costly rationing arrangements.
- By increasing energy use, consumption subsidies boost demand for imports or reduce the amount of energy available for export. They can, therefore, adversely affect the balance of payments and energy supply security by increasing import vulnerability.
- Subsidies to specific energy technologies will tend to undermine the development and commercialisation of other technologies that might ultimately become more economically and environmentally attractive. In this way, subsidies can "lock-in" technologies to the exclusion of others.

These costs are ultimately borne at least in part by the intended beneficiaries of the subsidies in addition to the rest of society. Some of these costs may not disappear with the removal of subsidies due to the typically slow turnover of capital stock in the energy sector.

Social and Environmental Effects

Subsidies aimed at improving the welfare of poor or disadvantaged people can often lead to the opposite outcome. In practice, many energy subsidies intended to boost poor households' purchasing power or rural communities' access to modern energy are in fact distributionally regressive: their benefits accrue mainly to urban middle and higher income groups, while their costs fall on most of the population, including the poor. This is most often the case in developing countries. There are several reasons for this:

- The poorest households may be unable to afford even subsidised energy or may have no physical access to it, for example when a rural community is not connected to the electricity grid.
- Even if the poor are able to benefit from an energy subsidy, the financial value to them may be very small since their consumption is generally modest. Higher income households tend to benefit much more in nominal terms since they consume more of the subsidised fuel.
- Consumption subsidies that involve the imposition of caps on prices below market-clearing levels may lead to a need for rationing. Experience in many countries shows that in such cases middle and higher income households tend to appropriate the bulk of the available subsidised supplies, often through corruption. Price caps have also encouraged smuggling in some countries.

Subsidies can adversely affect the welfare of the poor in other ways too. Energy subsidies often go to large capital-intensive projects, such as hydroelectric dams, at the expense of local, small-scale labour-intensive alternatives, such as biomass burners. This can result in undesirable social consequences, including migration and urbanisation. Subsidies to large-scale thermal power plants that result in local pollution and health hazards tend to affect the poorest households most, since they tend to be less able to move from polluted areas.

The environmental effects of introducing and maintaining energy subsidies are complex and depend on the precise nature of the subsidy and energy source. Many subsidies, notably those that encourage the production and use of fossil fuels, tend to worsen environmental degradation through higher emissions of noxious and/or climate-destabilising greenhouse gases. In many towns and cities, local pollution associated with fossil fuel combustion in end uses or transformation (such as oil refining or power generation) is a major human health problem. Emissions of the main local pollutants – particulates, sulphur dioxide and nitrogen oxides (NO_x) – in the largest cities of many developing countries are well above World Health Organisation maximum annual mean guideline levels for air quality, especially for particulates and NO_x.

But fossil fuel subsidies do not necessarily always lead to adverse environmental effects. For example, encouraging the use of oil products can reduce deforestation in developing countries as poor rural and peri-urban households switch from firewood. This is a major reason for the maintenance of subsidies to kerosene and LPG in many countries. Public funding of fossil-fuel R&D activities could actually yield positive environmental effects to the extent that it results in the development and deployment of more efficient, cleaner-burning technologies. Also, subsidies to indigenous fossil-fuel production do not systematically lead to higher consumption if their removal simply results in increased imports on a one-for-one basis. Subsidies to support renewables, nuclear power and energy-efficient technologies may help to reduce noxious and greenhouse-gas emissions depending on how the subsidies are structured and market conditions.

Energy Subsidies and Sustainability

There is growing recognition around the world of the relationship between energy subsidy programmes and sustainable development. Access to modern forms of energy is one of several elements underpinning economic and social development and improved living conditions. Protecting the local, regional and global climate requires that the production, supply and use of energy be as clean and as efficient as possible. In many countries, the removal or reform of energy subsidies – especially those that encourage fossil fuel consumption – in combination with more rational taxation structures and other policy initiatives could play a significant role in steering their development onto a more sustainable path.

Economic development, social welfare and environmental protection form the three pillars of sustainable development, but the priority individual governments place on each varies greatly from one country to the next depending *inter alia* on the stage of development, land use patterns and political factors. In the least developed countries, emphasis is usually placed on providing people with basic services to improve their living conditions. The most developed countries put more emphasis on the environment. Energy subsidies need to respond to shifts in policy priorities as well as in market conditions, the state of technological progress and social developments. However, the rigidity and inertia of many subsidy programmes in practice and the institutional and political barriers that tend to emerge to their reform make this difficult.

The removal or reduction of energy subsidies in the context of a move to more sustainable development policies does not mean the subjugation of social welfare goals. In general, they can be addressed more efficiently through alternative mechanisms involving direct financial transfers, since the economic efficiency losses and environmental effects are less marked.

4. How to Design and Implement Energy Subsidy Reform

Barriers to Subsidy Reform

Even when policymakers determine that the cost of a given subsidy outweighs its benefits, it can be very difficult to reform the subsidy in the face of hostility from its principal beneficiaries. By nature, the costs of an energy subsidy are usually spread throughout the domestic and, in the case of trans-boundary environmental effects, regional or global economy, while its benefits accrue disproportionately to certain segments of the population. Those beneficiaries will always have an interest in defending that subsidy when their gains exceed their share of the economic or environmental costs. The rest of society, who bear the net cost of the subsidy, will be less inclined to mount effective political action to remove the subsidy since the cost is likely to be much smaller in per capita terms than the benefit to the recipients. Furthermore, demonstrating the economic cost of subsidy can be very difficult, whereas the proponents of retaining subsidies often find it much easier to provide concrete examples of their social benefits, say in terms of jobs supported or financial savings to poor people.

This aspect of subsidies creates asymmetric incentives for politicians – an effect known as *political mobilisation bias*. It is much easier to garner political support for the interests of small, homogeneous groups that benefit from subsidies than for the comparatively vague and less tangible interest of the general population. This is especially true where one of the main costs of a subsidy are higher greenhouse-gas emissions, which affect the population of the planet as a whole.

Designing and implementing subsidy reform must take account of these barriers. They help to explain why it is so hard to remove subsidies once they have been introduced. This problem implies that the immediate net benefits of a subsidy programme need to be demonstratively large and likely to persist for a prolonged period for its introduction to be justifiable.

Criteria for Designing Subsidy Reforms

In most instances, policymakers seeking to reform subsidies are faced with trade-offs between economic, social and environmental effects. This makes it hard to determine whether the net overall effect of the removal or reform of a given subsidy is positive or negative. Nonetheless, reform is justified where the net effect is judged to be positive after thorough assessment. This would be the case, for example, where the economic and environmental benefits are deemed to outweigh the social costs.

There is no all-embracing prescriptive model for countries seeking to reform their energy subsidies. Every country needs to take account of national and local circumstances, including its own set of policy objectives and priorities, its stage of economic development, market and economic conditions, the state of public finances and the institutional framework. But there are a number of basic principles that countries need to apply in designing and implementing reforms. Experience has shown that subsidy programmes and their reform should meet the following key criteria:

- *Targeted:* A subsidy will normally only be cost-effective if the benefits are limited to a clearly defined targeted group.
- *Soundly-based:* All subsidy programmes should be justified by positive net benefits that should be demonstrated through thorough integrated analysis of their economic, social and

environmental implications. In reality, this requires reliable data and effective analytical capacity. This is rarely the case in practice.

- *Practical:* Subsidy programmes must be implementable at reasonable administrative cost, including the resources required to monitor, prevent and deal with abuse.
- *Transparent:* The financial costs and the channels through which cash payments are made must be fully transparent. On-budget costs should be properly accounted for and the results made available to the public.

Perhaps the single most important consideration in designing or reforming a subsidy programme is effective targeting. This may involve ensuring that the benefits of a given subsidy accrue to a particular social group such as the poorest segment of the population or a specific type or set of producers or consumers. In practice, subsidies often accord benefits to other categories of producers or consumers, resulting in significant economic distortions and costs. For example, special low rates for electricity supply may be available to higher income households even though the intention may be to relieve the financial burden on poor households.

In practice, the overriding objective of subsidy reform should normally be to reduce the overall size of subsidies or remove them completely. But there remains a case for retaining a degree of subsidy to improve access to modern, conventional energy sources for the poor – especially where the social welfare infrastructure for distributing income support to the poor does not exist. This case is particularly strong for electricity, because of the key role it plays in economic and social development and in alleviating poverty – key elements in economic and social sustainability (see below). Subsidies aimed at improving access should not, however, lead to excessive levels of energy consumption.

Implementing Subsidy Reform

The barriers outlined above can often make it very hard for the public authorities to implement subsidy reform. In addition to the political will to take tough decisions that benefit society as a whole, the following approaches can help policymakers in overcoming such resistance:

- Reforms need to be implemented in a gradual, programmed fashion to alleviate the financial pain of those who stand to lose and give them time to adjust their energy consumption patterns.
- The adverse impact of subsidy reform on the incomes and welfare of specific social groups can be offset by compensating measures that support their real incomes in more direct ways if this is considered socially desirable. The ability to do this will depend on the existence of systems and structures for distributing welfare payments to the needy. However, this kind of infrastructure does not always exist in poor countries.
- Effective communication of the overall benefits of reform to the economy and society are essential to counter political inertia and opposition.

Lending institutions, aid providers and international organisations can play an important role in assisting developing countries and transition economies in both designing and implementing subsidy reforms through the transfer of competence and technology and by imposing well-reasoned conditions for lending and development aid. It is nonetheless important that these organisations

take account of social considerations in formulating their strategies for developing countries and transition economies.

Energy-subsidy reform needs to be implemented in tandem with the broader restructuring of the energy sector and the economy as a whole, involving greater market orientation, the encouragement of private and foreign investment, and the reorganisation of state enterprises. In the long run, competition could play a key role in helping to reduce energy supply costs and, therefore, prices, which would ultimately help to reduce the need for subsidy.

Given the constant shifts in market conditions and policy priorities, it is essential that the costs and benefits of subsidies, once in place, be effectively monitored to ensure that the rationale for them remains valid. There is often a strong case for incorporating time-limits or sunset clauses in a subsidy programme, for instance where its rationale is to address a specific market entry barrier. Once a technology is established and economic, the subsidy would normally no longer be required. It is also vital that effective action is taken to prevent or limit abuse, so that subsidies are limited to targeted categories.

Subsidising Electrification Cost-Effectively

The case for subsidising electrification, especially in developing countries, is widely accepted. The main rationale is to assist poor people and rural communities in gaining access to electricity which are needed for effective lighting and refrigeration. Alternative energy sources are either more expensive, less effective in providing the service or carry health risks (such as those associated with indoor burning of biomass). Access to electricity is recognised as being an essential element in economic and social development, by reducing manual labour, improving health, enhancing productivity and educational attainment and improving the quality of life of poor people. In reality, these benefits may well exceed the long-run costs involved in providing electricity service. But poor people may be prevented from gaining access to electricity by high up-front connection charges or non-availability of service. In this case, a degree of subsidy might in principle be justified. In general, targeted subsidies work better for electricity because of the fixed nature of service delivery. Special grants and rates are less easily diverted away from the intended recipients.

The challenge for the public authorities is to ensure that electricity subsidies achieve the objective of promoting access to electricity for the poor in a cost-effective manner while ensuring the financial viability of the electricity supply industry. In formulating or reforming an electrification-subsidy programme, the key questions that need to be addressed are:

- *Who?* At a minimum, households and farmers that are not already connected to the distribution network. Subsidies to the poorest existing customers may also be justified.
- *What?* For customers without service, it may be reasonable to subsidise access to the service. For example, grants could be made available to cover part or all of the capital cost of connection. The electricity supplier could also roll part of the cost of connection into monthly charges. Local circumstances will determine whether it is more economical to extend the existing grid or to develop decentralised production and distribution networks, possibly based on locally sourced renewables (for example, biomass or hydropower). For both new and existing customers, there may be a case for subsidising service through special, low tariffs – often called lifeline rates – for poor households, defined in terms of income or consumption level.

- *How?* Experience has shown that demand-side subsidies tend to work better than producer subsidies in ensuring that subsidies go to targeted customer groups and provide incentives for efficient service delivery, although the management of programmes (such as distribution of connection grants) can be expensive.
- *How much?* In principle, subsidies should be large enough to provide an incentive to distributors to extend service to poor households that would otherwise not receive it, while not undermining incentives to provide service on a sustainable, profitable basis or creating unnecessary market distortions. Lifeline-rates, if used, should be limited to modest levels of consumption (probably less than 50 kWh per month in most cases) such that subsidies are targeted effectively and not appropriated by richer households. This can be achieved by applying the lifeline rate to households that subscribe to the lowest capacity or by applying the rate to only the first tranche of consumption, with full cost-based rates applied to higher levels of consumption. In the latter case, richer households benefit to the same extent in absolute terms as poor households for that first tranche, but less in proportionate terms. The level at which the lifeline-rate is set needs to take account of households' ability and willingness to pay.

Annexes: Regional Workshop Summaries

The following reports highlights key points arising from the workshops' discussions. They do not attempt to provide all elements of presentations and discussions, but rather capture the direction and main ideas coming out of each meeting.

The first workshop was held in Paris, France on 6-7 November 2000, focusing on OECD countries and transition economies. The second was held in Durban, South Africa on 15-16 December 2000, with a focus on Africa. The third, with an Asian focus, was held in Bangkok, Thailand on 16-17 January 2001.

Approximately 50 representatives from government (energy, economic affairs and environment ministries), non-governmental and inter-governmental organisations, research institutes and industry attended each workshop. Participants mainly came from the region where the workshop was held, but representatives from other regions also attended each workshop in order to facilitate dialogue between the regions and ensure continuity between the discussions.

A: Paris Workshop – OECD and Transition Economies

Opening Remarks

Mr. Robert Priddle, Executive Director of the IEA, suggested that progress in subsidy reform could help progress in all the three "pillars" of sustainable development – economic, social and environmental – and move the world onto a more sustainable path. Ambassador Irene Freudenschuss-Reichl, Co-Chair of the CSD Group of Experts on Energy and Sustainable Development, indicated her wish that regional meetings would help countries learn from each other's experience and enhance co-operation, as well as build common ground in order to forward discussions. She hoped that dialogue between experts would help identify concrete options to solve some of these issues, which could then help focus discussions at CSD-9.

Session I: Subsidies - Today's Situation

This session focused on defining and identifying subsidies. Many OECD governments continue to create new subsidy systems while maintaining older ones. The following five main issues were raised in the presentations and discussion:

- Although no common terminology exists for subsidies, subsidy systems in every case are meant to influence marginal costs and revenues relative to other market alternatives. While OECD countries mainly rely on producer subsidies, developing countries often use consumer subsidies. However, the large variety of the effects of applying identical policy instruments to remove subsidies, make comparison difficult across countries.
- The cost-effectiveness of subsidies is greatly reduced by leakage effects (subsidies going to populations other then the targeted ones) and lock-in effects (subsidies to certain technologies tend to exclude other potentially economic and environmentally friendlier technologies).
- Lock-in effects were discussed in considerable depth. In particular, the usefulness of subsidies to support infant industries was recognised as long as the subsidies are removed as soon as the technology becomes competitive. Subsidies to technology research are

thought to have less negative effects since they do not tend to get extended when the technology has reached commercial viability.

- The effects of subsidy removal are often not symmetrical to their implementation: some of the leakage, lock-in and other distorting effects of subsidies may not disappear with subsidy reform since the energy infrastructure based on previous policies might not change as fast as the policies themselves.
- Subsidy reform may improve industrial competitiveness, increasing the volume of activity and at least partially offsetting the short-term negative effects on profits. However, there is a pressing need to design comprehensive reform packages, taking account of social and economic effects, to avoid creating negative social effects that outweigh the economic and environmental benefits.

Session II: Rationale and Goals for Energy Subsidies

The reasons for subsidies include security of energy supply, competitiveness of industries, employment and environmental protection, as well as social and economic development especially in transition economies:

- The main role identified for most subsidy systems is the correction of market imperfections, including the support of political goals. Strong and ongoing economic incentives were recognised to be necessary to achieve many long-term social policy goals and environmental targets. Social policies are often adopted and implemented by governments under public pressure.
- Some participants said that the removal of subsidies to indigenous fossil-fuel production might lead to higher imports and not lower use of the fuel. Others suggested that fuel use might be reduced if budgets freed by subsidy removal were used for other purposes, such as promoting switching to renewables.
- Ways to judge new planned support systems prior to implementation were addressed. Although the first (and most desirable) instruments to be applied are "no-regret" options, full cost-benefit analysis could be systematically incorporated into decision-making criteria. Levels of support could be calculated in order to overcome market barriers to investment without providing a rent to project developers that encourage inefficient investment decisions.
- Subsidies to encourage the development of environmentally sound technologies were also discussed. Tender systems were considered less successful since they create extra competition between cleaner energy sources; the most competitive technologies tend to set the price, which excludes others.

Session III: Effects of Reforming Subsidies

The necessity to understand the impact of existing systems before attempting to reform subsidies was underlined. While the environmental and economic effects of subsidies are fairly well understood, there is a need to improve measurement and evaluation of the social effects, including income distribution and employment. In addition, the inter-linkages between these effects are difficult to assess. The lack of integrated analysis of effects hinders policy reform.

How subsidies support low-income populations was then raised. The removal of fossil-fuel subsidies benefiting low-income populations was believed to have a strong impact on their access to energy services but little effect on the environment. In addition, it was argued that even if subsidy removal tends to lead to more rational decision-making and less wasteful use of energy, the absolute effects are minimal because of the low level of consumption by poor households.

Subsidy removal can lead to significant negative socio-environmental effects. In India for instance, if subsidies to kerosene are not replaced with direct support, there would be a risk that households shift to using biomass, which can lead to adverse effects on health and deforestation. However, it can be difficult to transform subsidies into direct financial assistance since many countries do not have adequate welfare infrastructure.

Since increasing prices for energy services to world levels may be too harsh for countries where the average salary is very low, a distinction was made between the "right" price – the economically efficient price – and a "fair" price, corresponding to what consumers can afford.

Session IV: Policies for Energy Subsidy Reform

Providing an opportunity to discuss barriers to such reform, the session mainly addressed the following issues:

- One of the strongest arguments for maintaining subsidies is the need to ensure security of supply. Since this is a matter of national competence, harmonised policy reform of EU law tends to be difficult. Nevertheless, this rationale for subsidising coal may be spurious since coal is an abundant and flexible resource, available from a range of reliable sources.
- Non-internalisation of external costs strongly contributes to making coal competitive. It was suggested that subsidy removal would have only a limited short-term environmental impact since domestic resources would most likely be replaced by imports. The longer-term impact, however, could be positive if the budgets saved are spent on environmentally beneficial policies that result in lower imports. In addition, the rationality of subsidising loss-making activities with few prospects of becoming competitive is questionable.
- A subsidy program to the UK mining sector was cited. Subsidies were recently re-introduced temporarily to provide support to national producers in the face of low international prices. The programme involves safeguards limiting market distortions and a limit on subsidies to a two-year transitional period; subsidies have been allocated only to mines considered commercially viable in the long term but suffering short-term problems, and not to mines that are already competitive. To avoid distorting competition, contracts signed below market prices did not qualify for aid. It was suggested that this example shows that non-distorting subsidy schemes can be designed in a competitive market if the supported activity is viable, if subsidies are clearly thought out and if their removal is planned at the outset.
- Research and development support is not as difficult to reform as other producer and consumer subsidies and can prove important in keeping long-term options open. Full cost-benefit analysis should be applied to all technology R&D, including renewables.
- Additional issues, including social welfare, equity and access to energy, complicate the design of subsidy reform packages. Policies designed to increase poor households' access to energy have tended to benefit mainly higher income groups in developing countries.

Hence, it was suggested that the failure of previous systems due to bad governance, lack of accountability and strong vested interests should be taken into account when designing reform packages.

- It is difficult to devise universal lessons from successful systems since each subsidy is designed under specific national circumstances and to meet specific goals. In this context, a presentation on Latin American efforts to devise sustainable development policies focused on identifying the impact of past policies as a critical need before considering adding new policies.

Session V: Focus on Economies in Transition

This session addressed issues specific to economies in transition to market economies, with a particular focus on the effects of subsidy reform on the private sector:

- Foreign direct investment in the energy sector is discouraged if prices do not reflect the cost of energy services. But price volatility leads to strong consumer pressure to control prices. Hence, some countries try to reflect the cost of energy provision in wholesale prices, while keeping a cap on end-user prices. However, recent oil price increases have often overwhelmed these efforts: in some transition economies, domestic energy prices are only a tenth of international market levels.
- While governments are often willing to promote cleaner energy production and renewable energies, they generally do not have the necessary funds and are reluctant to increase end-user prices.
- The first priority for many countries is the improvement of collection rates, which would boost funds to invest in maintenance and new capacity. In many cases, payment problems have already been reduced by stopping supply to non-payers.
- While often not based on subsidy reform, efforts are being made to reduce local and global pollution in these countries. Proposed instruments include minimum environmental standards, energy tax reform, environmental taxes and pollution charges. However, few of these measures have been implemented yet. Consensus is needed to move them forward and enforce them.
- Energy subsidies together with regulatory uncertainty, inadequate energy laws and a poor business environment provide strong disincentives for investment. Multilateral banks generally agree to invest only if subsidies are felt to be sufficiently accounted for and are planned to be reduced or phased out.

Session VI: Wrap-up

The last session synthesised some of the main points raised during the two-day workshop:

- Energy-subsidy reform must be addressed on a case-by-case basis. Participants agreed that the "devil is in the details", and the appropriate approach to reform in one country may not apply to others. Reform should be implemented in a pragmatic and transparent way.
- The main issue is to reform subsidies without creating undue social and environmental problems. In particular, since the drivers for putting subsidies into place are social, environmental or economic, these underlying issues must be addressed prior to subsidy

removal. In any case, a pragmatic approach to defining concrete options for future policies is required.

- Further work would be valuable, including comparison of the successes of subsidy reform policies in both OECD and non-OECD countries. Exchanges of experiences could help promote reform at the national level and further negotiations at international meetings. However, language and the focus of discussions need to be adapted to specific regional circumstances.
- Subsidy reform should be popularised. Many policymakers as well as the population at large lack an understanding of the damage that subsidies can cause and the long-term benefits their reform could bring.
- Mrs. Jacqueline Aloisi de Larderel, Director of UNEP-Division of Technology, Industry and Economics (DTIE), highlighted the following next steps that could be taken.
  - Identify and analyse success stories.
  - Increase awareness of energy subsidy issues.
  - Perform analytical work on the impact of energy subsidies and their reform within an integrated analysis of economic, social and environmental effects.
  - Build on similarities between transition economies and developing countries, exchanging lessons learned while adapting analysis to local needs.
  - Prepare a list of key issues and policy options to help governments identify opportunities for reform adapted to specific country needs.

B: Durban Workshop – Africa

Opening Remarks

Mr. Yinka Adebayo from UNEP's Regional Office for Africa made the opening remarks. He underlined the indivisible link between economic and environmental issues when it comes to introducing and reforming energy subsidies, and stressed the need to modify policies to achieve sustainable development. He was followed by Ambassador William Ramsay, Deputy Executive Director of the IEA, who stressed that balanced attention be paid to each of the three pillars of sustainability: economic, social and environment. He raised the following questions that should be considered concerning when addressing energy subsidies:

- Are subsidies cost-effective?
- Do they consider all externalities?
- How can subsidies be phased out once they are in place?
- How to involve the energy sector when other policies are being made?

Session 1: Regional Perspectives

Speakers shared information on experiences, goals and recommendations on subsidy reform in European OECD and transition economies as well as Latin American and Asian countries. The following two main issues were discussed:

- How can developing countries improve access to modern forms of energy?

- How can the environmental impact of producing, supplying and using modern forms of energy be reduced?

Session II: Rationale and Goals for Energy Subsidies in Africa

Common messages that emerged from all African countries in this session are the following:

- There is a need to better define the linkages between energy subsidies and sustainable development. This means ensuring that the economic, environmental and social rationales for introducing subsidies in place are made transparent and attainment of them is monitored.
- Energy pricing needs to take account of the needs of poor households and rural communities, including access to modern forms of energy.
- It is important to determine when subsidy reform is desirable, and to quantify the costs and benefits of the reform using an integrated analytical approach.

Session III: Impacts of Subsidies

Presentations focused on case studies of the positive and negative effects of subsidies. Countries reported on subsidies to electrification, solar photovoltaics, LPG and kerosene, petrol and nuclear power. The discussions raised a number of important issues:

- The assessment of the impact of subsidies and subsidy reform must cover the different sectors of the economy and whether they go to production or consumption.
- Decisions to subsidise a source of energy should be based on thorough analysis or feasibility studies covering the economics of all energy supply options, involving quantification of the number of needy households and assessment of the financial cost and other effects of implementing the programme. This requires the collection of comprehensive, comparable and reliable data.
- The political consequences of subsidy removal were discussed at length, with emphasis given to the need to consider the use of measures that offset subsidies such as fuel and green taxes.

Session IV: Energy Subsidy Reform from a Broader Perspective

While emphasising the need to take into account social equity, economic and environmental considerations when making any policy decision, participants raised the following issues:

- There is a need to consider carefully the reason why a particular energy system should be promoted before introducing subsidies.
- The participation of all stakeholders in the decision-making process is important to ensure transparency.
- Countries need proper guidelines on how to implement energy subsidies. They need mechanisms to administer, monitor and quantify subsidies to track their positive and negative effects and identify and deal with abuses. It is also important to clarify the objective of subsidies and determine whether the subsidy is to introduce new technology or to help the poor.
- Expenditure on subsidies can be a drain on government budgets.

- Financial mechanisms other than subsidies should be explored in order to achieve the country's policy objectives.
- Because of inadequate data, analytical work and exchange of information, it is difficult to do proper analysis before making decisions.
- Learning from other countries' ideas and experiences is a useful exercise, but it is necessary to consider the special and unique situation of each country in adapting policies in practice. Some countries, for example, are particularly concerned about the reliability of energy supply.

Session V: Challenges for Energy Subsidy Reform

A number of pending concerns and challenges were raised in the presentations and discussions in this session:

- Problems that are encountered include poor targeting of subsidies, such that do not just benefit low-income groups, and instances where subsidies encourage cross-border fuel smuggling.
- A challenge for policymakers is to identify ways to remove subsidises on non-renewable energies, in particular fossil fuels, and to put in subsidises on renewable energy alternatives where appropriate.
- Some African countries have succeeded in removing subsidies, particularly on petrol, although it is not totally clear what strategies they have used.

VI: Conclusion and wrap up

In this session, chairpersons presented the ideas obtained from presentations and discussions. The following concerns were raised and solutions proposed:

Concerns

- It is necessary to make progress in making the provision of energy services, particularly to the poorest segments of the population and rural communities, more sustainable with respect to the economy, social welfare and the environment. In balancing these three elements, social considerations are often the most important in the case of Africa, including health, safety, education and slowing migration from rural to urban areas. Environmental issues include deforestation, desertification and local air pollution. Employment was cited as the main economic concern.
- Due to the lack of ability to pay for energy services as well as the small size of the market, it is unlikely that energy services and in particular electricity will be made available to the poorest segments of the population and dispersed rural communities without some form of subsidy.
- However, experience shows that the benefits of subsidies most often do not go to those who need them most.
- In addition, the provision of energy subsidies has some significant downside effects. These include inefficient or over-consumption of energy, a large drain on government financial resources and under-investment in electricity and other energy infrastructure.

- Experience suggests that cost-reflective pricing of energy is required. Under-pricing can lead to over consumption and waste, and over-pricing can prevent the poorest segment of the population from obtaining access to energy.
- There is no one answer for all countries. National circumstances, access to energy resources and opportunities for particular renewable technologies differ from one country to another. It is interesting to note that even countries with ample energy resources face significant problems in getting energy services to the poor and rural populations, and maintaining reliable supplies.

Suggested Solutions

- Subsidies must be targeted to ensure that they reach those who need them most.
- The collection of adequate data to determine *inter alia* the number of households, the cost of various energy sources and appropriate price levels (taking account of ability to pay) helps governments implement subsidy reform.
- Governments need to ensure that subsidy programmes are properly structured, monitor their effectiveness and minimise abuse.
- Information campaigns associated with the provision of the energy service should be conducted to help consumers change their habits.
- Implementation should involve identifying specific local needs as well as the use of trained personnel for installation and upkeep of equipment at the local level.
- Many innovative systems exist to help overcome some of the problems associated with subsidy programmes, for example escalating tariffs and metering. It is important to ensure that thresholds for provision of the subsidised energy services are not set too low, so that those households that can pay market rates do so.
- The right choice of energy sources to subsidise can differ given the particular circumstances.
- The capital costs of grid connection can be extremely high, especially to rural and low population areas. Off-grid systems can in many cases be more economic.
- Political leverage of industry and high-income groups can make subsidy reform difficult, but this does not mean that reform should not be tried. Rather, changes can be phased in gradually to minimise the effects.
- Reform should take place in conjunction with the implementation of other social programmes, so that public policy issues are addressed in a comprehensive manner.

C: Bangkok Workshop – Asia

Opening remarks

Mr. Yoshihiroi Natori, Deputy Regional Director of UNEP Regional Office for Asia and the Pacific (ROAP), made the opening remarks. He stressed the importance of efficient production, supply and use of clean energy for sustainable development. He highlighted the fact that subsidy reform could help support the three pillars of sustainability and expressed the hope that the UNEP/IEA

regional workshops would help countries learn from each other's experience and enhance co-operation, as well as build common ground between countries in order to further discussions.

He was followed by Ms. Siriporn Sailasut, Director General, Department of Energy, Development and Promotion, Ministry of Science, Technology and Environment of Thailand, who recognised the social rationale behind the use of energy subsidies while emphasising the need to phase them out in order to promote more efficient markets. She underlined the necessity for a political will to do so, while pointing out the need to promote efficient technologies, including renewables.

Mrs Kristi Varangu, IEA, provided participants with some background and context on the CSD-9 process. Mrs Emeline Fellus, UNEP, made a brief presentation on subsidies and their effects, emphasising the need to assess their economic, social and environmental costs and benefits in an integrated manner.

Session I: Regional Perspectives

Speakers presented outcomes from the two previous regional workshops, including experiences, goals and recommendations on energy-subsidy reform in the respective regions, based on country-specific case studies. The following main issues were raised in the presentations and subsequent discussion:

- Subsidies often lead to inefficiency and over-consumption of energy. Thus, subsidy reform is expected to have overall positive impacts on the economy and the environment. However, social impacts such as access to energy and basic living requirements need to be taken into consideration.
- Participants highlighted the importance of carefully defining the population group(s) to be supported by subsidies and using appropriate delivery systems to ensure that subsidies reach their targets.
- Restructuring the energy sector was identified as a key objective for developing countries and transition economies.
- Renewable energy sources and technologies can provide a large range of options to increase production and distribution of clean energy, especially in remote rural areas. However, due to large up-front costs, targeted subsidies are often needed to favour development and deployment.
- National and local circumstances such as availability of energy resources and the geographical distribution of the population need to be taken into account when reforming energy subsidy systems.

Session II: Asia – Energy Subsidies: Rationale and Effectiveness

Presentations and discussion in this session sought to identify the rationale behind subsidies and to assess how effective existing systems are:

- While most energy subsidies in Asia are implemented for social and economic reasons, participants generally found that they are often not very effective in achieving these goals. It was also noted that the overall economic impact of energy subsidies is generally negative and that they put great financial pressure on government budgets. One participant

mentioned that up to 25% of his country's national budget had been spent on energy subsidies due to the recent dramatic rise in oil prices.

- Environmental issues are closely linked to energy subsidies and energy-subsidy reform. Subsidies to non-renewable energy encourage inefficiency and over-consumption of energy in most cases, increasing the risk of climate change and exacerbating air pollution and health problems. On the other hand, subsidies can benefit the environment when they are directed to renewable energy or to more efficient use of energy in general.
- It was agreed that the overall challenge in the energy sector is to reform rather than to remove subsidies.
- The need to develop comprehensive policy packages was expressed, including subsidies and green taxes, cross-subsidies, reduction of import duties and the provision of low-interest loans, research and development.
- Emphasis was also put on the necessity to enhance public awareness of the real price of energy sources and their socio-economic and environmental effects.
- Recognising the lack of data and information, participants generally agreed that further studies and analytical work are required to clearly assess the quantity and effectiveness of energy subsidies as well as the impact of past energy-subsidy reforms. There is also a need to take into account the impact of international oil price volatility on all sectors of the economy.
- The importance of establishing transparent full cost accounting was highlighted in order to allow reliable cost and benefit comparisons between renewable and non-renewable energy resources.

Session III: Asia – Impacts and Challenges Associated with Subsidy Reform

Despite the historical, geographical, socio-economic and cultural diversity of the countries, all participants agreed on the general need to gradually reform energy subsidies, while taking account of regional factors. The following challenges for subsidy reform were specifically mentioned:

- The first challenge is the need to make subsidy systems more effective – in other words, define and implement systems that efficiently reach the targeted people, mostly those with lower income and/or living in remote rural areas with insufficient access to energy services.
- On top of the political and legal obstacles to reform, a lack of financial resources was recognised as a major problem. Ways to attract investments in the energy sector were also addressed. Many participants agreed that subsidy reform is a prerequisite to attract investment from the private sector, especially in the power sector.
- Special consideration was given to the use of energy subsidies to encourage public transportation.
- The need for subsidies to increase penetration of renewable energy was also discussed in depth. Complementary policies to reinforce the effect of governmental subsidies to renewables were mentioned, including legal and regulatory changes and cross-subsidies between consumer categories. The removal of subsidies to non-renewable energy sources and taxation of polluting activities were also mentioned as possible instruments. But such reforms are often politically difficult to implement.

Session IV: Wrap-up, Conclusions and Recommendations

The last session synthesised the main points raised during the two-day session. An overall challenge is to reform subsidies to economic efficiency, without creating undue social and environmental problems:

Concerns

- The provision of energy subsidies, in economic terms, has significant downside effects such as inefficient or over-consumption of energy, a drain on government fiscal resources, and under-investment in electricity and energy infrastructure. The economic crisis in Asia, involving a sharp devaluation of local currencies, and the recent increase in international oil prices have exacerbated these effects.
- Energy pricing should be market-based. While under-pricing can encourage over-consumption and waste, over-pricing excludes the poorest population's access to energy services.
- Experience shows that subsidies most often do not reach those who need them most. Nevertheless, it is unlikely that the poorest segments of the population and dispersed rural communities will have access to energy services and in particular electricity without some form of subsidy. This is due to the lack of ability to pay for energy services and the small market size.
- There is no single, common model for subsidy reform since national circumstances, access to energy resources, and opportunities for particular renewable technologies vary greatly from country to country. It was interesting to note that even energy resource-rich countries face significant problems in providing energy services to poor and rural populations.

Suggested Solutions

- Since subsidies are difficult to remove once in place, their implementation needs to be carefully thought out.
- Many alternative policy measures are available, for example lowering import duties and VAT for energy-efficient technologies or public transportation equipment. Cross-subsidisation is already used by many governments to address the higher cost of access to remote areas with a smaller impact on their budgets than direct subsidisation. Taxation can be considered as another option, which emphasises the importance of integrated policy-making and reform.
- Outside international influences such as WTO rules and IMF and World Bank financing prerequisites may encourage countries to undertake energy-subsidy reform more quickly, but countries may consider this as an infringement of national sovereignty.
- Even in countries where per capita energy use is low, efficient energy use should be encouraged. In addition, renewables are often the most cost-effective sources of energy in remote areas due to their modularity.
- Raising public awareness through information campaigns and education should be a key element of a sustainable development strategy.
- Finally, more work needs to be undertaken on subsidy issues, including data collection and analysis of economic, environmental and social effects on a country-by-country basis.