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THE VITAL ROLE OF ENERGY END-USE EFFICIENCY FOR SUSTAINABLE DEVELOPMENT

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SUMMARY

The non sustainability of the present energy systems at world level can be summarised by three statements : energy insecurity, energy inequality, energy damages to the environment. Continuing along the present path is not compatible with the objectives of sustainable development and a growing source of heavy risks and conflicts.
The compatibility of energy production and use with a sustainable development lies with the capacity in all countries to build energy systems based on high energy efficiency on both demand and supply sides and the utilisation of renewable sources of energy.

This presentation focuses on the development of energy end-use efficiency strategies, which are the major tool for curbing energy demand and are also a prerequisite for ensuring that renewable energy will represent in the future the bulk of energy supply to human activities.

Access to affordable energy is fundamental to human activities, development and economic growth. But it is access to "energy services", not energy supply *per se*, that matters. An energy service is the combination of the way we can or do provide this service (for example the mode of transportation, or the type of housing), the quality of the equipment or appliance used (insulated house, low consuming car, efficient bulb or boiler, etc.) and the quantity of energy necessary for running this equipment. The quantity of energy varies considerably according to the type of use and the equipment utilised : if they are "energy efficient", the quantity of energy needed for the same service can be brought well below its current level.

The potentials for energy end-use efficiency improvements are enormous. Over the next twenty years, the amount of energy products required for satisfying the

same level of energy services could be lower by 20 to 40%, depending on the country concerned, compared to the "business as usual" practices, through cost effective measures. The industrialised countries can and must reduce their total energy consumption; most of the developing countries must increase their energy consumption for their economic development, but they can reach this objective with a much lower growth than the industrialised countries in the past by applying energy efficiency strategies.

Energy price mechanisms, such as removal of subsidies or the incorporation of externalities, are effective in lowering energy consumption trends, but this does not always mean an improvement in energy efficiency. Even without changing the energy prices for the sake of improving end-use efficiency, energy end-use efficiency policies can and should be pursued.
These policies are based on for major elements : institutional and capacity building, demand side oriented energy policy formulation, regulations and legislation, financial incentives and the promotion of investment.

The key feature of an energy end-use efficiency strategy is that it extends over all economic and social activities, far beyond the energy sector. To motivate all the economic agents, from enterprises to households, there is a need for special entities with a wide range of qualification: technical, economic and financial, promotional, etc.
In many countries, political and administrative organisation is decentralised and the provinces, regions or cities can, by setting up local teams or agencies, implement energy efficiency programmes taking full account of local development and environmental specificity.
At national level, national agencies for the development of energy end use efficiency and the development of renewable energy use have proven to be the most effective tool to promote and implement successful policies.

Energy policy formulation has been traditionally and still is in many countries, "supply oriented" and established *de facto* by the powerful national energy companies. It is essential to reverse this tendency and to elaborate energy policies through a bottom-up approach starting from the needs of energy services for the consumers, the potentials of energy end-use efficiency programmes and then the needs for energy products, the supply of which will be the responsibility of the energy sector. In this case, emphasis is put on the demand side and energy efficiency measures are the first step (and not the last) of energy policy actions. The exercise of "energy planning" based on demand analysis and forecast studies presenting various scenarios of demand side management are essential tools for the decision makers.

Legislation and regulations are powerful tools for energy efficiency policies. These tools have been well developed in the western industrialised countries and

the more effective are thermal regulations for buildings, standards and labels for electric appliances and energy consumption regulations for cars. Energy efficiency regulations are currently reinforced by CO2 or greenhouse gases emission regulations. In the same category, voluntary agreements can be effective, in particular in industry.

Financial incentives and the promotion of energy efficiency investment remain the bottleneck for the generalisation of energy efficiency projects in all sectors. Due to the lack of information or access to efficient techniques, and to market failures which have been thoroughly investigated, energy efficiency need public financial support, at least for promotion an information activities. Public subsidies are important to launch next methods or techniques but are not sufficient to boost investment. For investment promotion, the use of dedicated Funds (with resources coming from energy taxes for instance) have proven to be very effective in some countries. The development of guarantee funds, soft loans and public-private investment funds have been also successfully tested. The development of ESCOs (energy service companies) is also a way to be explored.