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Energy Services in International Trade: Development Implications

Note by the UNCTAD secretariat

Executive Summary

Energy is central to achieving the interrelated economic, social and environmental aims of sustainable human development, and energy services play a crucial role in providing efficient access to energy in support of development. They also constitute the value added in the energy chain, from exploration to consumption. Developing countries are thus faced with the challenge of, on the one hand, achieving more reliable and efficient access to energy, and on the other hand, of obtaining a greater share of the energy "business". The pursuit of both goals requires access to knowledge, expertise, technology and managerial know-how. The Expert Meeting may wish to address the elements of an energy services sector strategy for developing countries, with the following objectives: (a) to ensure efficient access to energy by all segments of the population; (b) to strengthen their competitive position in the supply of energy services at the various stages of the energy chain; and (c) to negotiate commitments and additional provisions in the ongoing multilateral negotiations on trade in services supportive of these objectives.

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I. INTRODUCTION

1. Energy determines the quality of our daily lives and drives economic development. Access to adequate, affordable energy is essential for eradicating poverty, improving human welfare and increasing living standards worldwide; however, it varies dramatically between countries and regions. Around one billion people in the industrialized countries consume nearly 60 per cent of the total energy supply. The lack of access to modern and sustainable energy is a major cause of environmental degradation in vast areas of the developing world, and a major impediment to sustainable development. According to the World Energy Assessment,[1] the current energy system is not sufficiently reliable or affordable to support widespread economic growth. The productivity of one third of the world's people is compromised by lack of access to commercial energy, and perhaps another third suffers economic hardship and insecurity due to unreliable energy supplies.

2. Energy is probably the biggest business in the world economy, with a turnover of at least US$ 1.7-2 trillion a year.[2] The World Energy Council estimates that global investment in energy between 1990 and 2020 will total some US$ 30 trillion at 1992 prices.[3] However, until quite recently, Governments worldwide considered the sector too crucial to be left to market forces. At present, countries in all regions are unbundling vertically integrated utilities previously engaged in the interrelated chain of energy activities and are often concurrently transferring ownership/management of formerly State-owned energy facilities to the private sector.

3. Energy services are required at each step of the energy chain from the location of the potential energy source to its distribution to the final consumer, constituting the value added in the energy chain beginning with upstream services such as exploration, extraction, drilling, derrick building and other construction services (identified in the General Agreement on Trade in Services (GATS)) under "services incidental to mining, rendered on a fee or contract basis at oil and gas fields"). The second stage relates to the transportation of energy, in some cases an undifferentiated segment of maritime transport, but in other cases specific to the energy sector, such as the GATS category of "transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas". The third – downstream-stage includes the services involved in delivering energy to the final consumer (such as the GATS category "services incidental to energy distribution"), which refers to "transmission and distribution services on a fee or contract basis of electricity, gaseous fuels and steam and hot water to household, industrial, commercial and other users".

4. The process of structural reform of the energy sectors in both developed and developing countries,[4] which has resulted in the breaking up of integrated energy

[1] *World Energy Assessment: Energy and the Challenge of Sustainability*, United Nations Development Programme, United Nations Department of Economic and Social Affairs, World Energy Council, New York, 2000, p. 3.

[2] *Economist*, "The slumbering giants awake", A Survey of Energy, 10 February 2000, pp. 6-7.

[3] Quoted in *Economist*, *supra*, footnote 2, pp. 6-7.

[4] Structural reform in the energy sector is meant to cut costs and improve the economic performance and efficiency of that sector by imposing free-market disciplines and commercial criteria. It can refer to a range of policy measures and take several different forms, including privatization (the selling of part or the whole of a government-owned energy system to private owners, including foreign investors), increasing

systems, the introduction of competition and the privatization of previously State-owned enterprises, especially in the downstream segments of natural gas and electricity, has led to the externalization of previously integrated services - such as energy transmission and distribution - and the demand for new services to take advantage of the opportunities of a freer market for energy, for example the operation of power pools, the provision of continuous information on energy prices, energy trading and brokering, and energy management. Additional services have emerged related to greenhouse gas emissions reductions and trading of emission rights.

5. The formulation of policy objectives with respect to energy services and their pursuit in trade negotiations will involve both the *development dimension*, i.e. how the strengthening of the energy services sector contributes to better and wider access to energy in developing countries and how structural reform in the latter's energy sectors can impact on their own development perspectives, and the *trade dimension*, i.e. how to strengthen developing countries' competitiveness in the world market for energy services, as well as an assessment of the implications that the deregulation of the energy sectors in the major developed countries could have on their markets for energy goods and services.

II. SECTORAL MARKETS OF ENERGY AND ENERGY SERVICES

6. The petroleum, natural gas, coal, nuclear energy, renewable energy, and primary and secondary electricity sectors each provide a specific market for energy services.

A. Petroleum

7. In the petroleum and natural gas sectors, large vertically integrated multinationals engaged in the extraction, refining and distribution of oil and gas products contract out (see box 1) the services that they need in order to find, develop and deliver oil and gas, such as the initial determination of likely sub-surface reserves, drilling services, derrick erection, well casing, specialized construction services to build pipelines and refineries, and services to remove impurities from oil and to liquefy and re-gasify natural gas. In 1999, large oil firms' activities related to the search for oil and gas made up only a fifth of their revenues, but contributed twothirds of their profits. In contrast, refining and retailing have become even less profitable in recent years because of stringent environmental regulations and fierce competition from new entrants.[5] New environmental requirements also apply in the shipping sector, with the result that capacity utilization of the world's tanker fleet was 97 per cent in 2000, the highest figure since 1973.[6]

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competition, demonopolization (particularly to unbundle monopoly into distinct entities), and deregulation covering both the removal of regulations and the reassessment of regulatory methods in areas where regulation remains appropriate. Regulatory reform is itself part of a wider phenomenon - the drawing back by Governments from direct intervention in markets.

[5] *Economist,* "Hunting the big one", 21 October 2000.

[6] *Financial Times,* 1 September 2000.

Box 1
Oil-related services in Ecuador

Petroecuador, the large State-owned utility, still largely dominates the petroleum sector in Ecuador, accounting for three quarters of the country's oil production and managing 86 per cent of the total number of oil fields. The Constitution of Ecuador provides that oil resources belong to the State, but that their extraction and development can be undertaken by public and private enterprises, domestic and foreign. The degree of service liberalization actually achieved under domestic law in the oil-related services sector is considerable: foreign services suppliers are allowed in practically all activities through different contractual arrangements. However, the outsourcing of services activities in the oil sector seems to have been beneficial mainly to foreign providers, while it has not been conducive to the development of a domestic services industry. The qualitative contribution of an oil-related foreign presence to the Ecuadorian economy has been limited. In particular, transfer of technology, enhancement of domestic technical and management skills and strengthening of energy-related domestic industrial capacity through inter-industrial linkage have been limited owing to the lack of local technology and managerial and organizational skills, and to the need to restructure the State-owned enterprise. Advanced services are mostly imported or supplied by established foreign firms. Additionally, the impact of energy service activities on the indigenous community and the environment has been, in a number of cases, negative. In a recent lawsuit between Texaco and Amazonian Indians, Texaco was alleged to have caused direct damage to 400,000 hectares of land and indirectly to 1 million hectares. As part of the Government's strategies aimed at reactivating the industry, a plan called "Oil Opening 2000" was launched in November 1999. Implementation of the plan will not be possible without the increased involvement of foreign investors.

Source: UNCTAD, *Investment Policy Review. Ecuador*, UNCTAD/AD/ITE/IPC/Misc.2, 2000, pp. 14 and 59

B. Natural gas

8. Natural gas is undergoing rapid expansion because of its contribution to environmental protection and energy diversification. Gas is usually transported and traded via pipelines, while very long-distance and overseas transportation often takes place by sea, the gas being in the form of liquefied natural gas (LNG). Only 24 per cent of natural gas production is internationally traded, compared with 70 per cent for crude oil, because of high transport costs and legal and logistical problems related to the construction and management of pipelines. The capital-intensive and long-term nature of investments in pipeline construction and the complexities involved in evaluating the costs and benefits of allowing gas transportation make it difficult for transit countries to negotiate advantageous agreements on gas transportation, and many of those countries are particularly poorly equipped for the task.[7]

9. Natural gas exploration and production are closely linked to oil exploration and production. However, the characteristics of natural gas transmission and distribution are

[7] The severe problems faced by transition countries in Eastern Europe and Central Asia are illustrated by Bannikov, M., "Energy regulators in the emerging markets", *International Energy Law and Taxation Review*, Issue 8, August 2000.

rather different from those of oil transmission and distribution, and more similar to those of electricity transmission and distribution.[8] The gas sector has been traditionally dominated by State-owned vertically integrated utilities; however, the introduction of competition in some countries has altered this pattern, allowing the emergence of independent operators. In liberalized markets, gas transport via pipeline - which remains a natural monopoly - has been separated from the other functions, namely production, wholesale and retail. Regulated third-party access gives any gas producer the ability to transport its product to the end market and any customer the ability to buy gas from any producer or wholesaler. Open access to transport and such services as storage have stimulated the appearance of large numbers of traders. By buying gas from one or several producers and reselling it later to others, who in turn may then sell it again, traders are more than just middlemen in the supply chain - they compete with the traditional suppliers.[9]

C. Coal

10. Coal is the most abundant fossil fuel and the cheapest source of energy in many countries. Internationally traded coal flows correspond to little more than 10 per cent of total consumption.[10] Service firms perform coal mining and preparation services for others on a contract or fee basis. Coal appears to be transported and distributed in the same way as other goods.[11] The coal industry's demand for services is increasing as the sector becomes more capital- and technology-intensive to improve efficiency and to reduce its negative impact on the environment.

D. Electricity

11. Within the electricity sector, four main functions can be singled out. The first of these is *generation*, the conversion of primary energy into electrical energy - which includes the operation of power stations and the procurement of primary energy. The second is *transmission* – the transfer of electrical energy in bulk from generators or import sources to the distribution level and to certain large final customers, including the transfer of electrical energy between electricity grids and/or between countries. The Transmission System Operator (TSO) is the entity responsible for running the high-voltage transmission grid and is the technical centre of any electricity system. *Distribution*, the third function, is the transport of electrical energy from the transmission network to final customers through medium- and low-voltage distribution lines. The forth function - *supply* – is the selling of electricity to end-users, metering and billing, and the provision of information, advice and financing. Since transmission and distribution remain natural monopolies over given geographical areas, access to the grid on non-discriminatory terms is essential for new suppliers in the electricity market. All

[8] Transmission includes transport from the point of purchase to the principal areas of demand, gas storage for strategic or load-balancing purposes and distribution to companies, large volume customers and power generators. Distribution involves the movement of gas through local low- or medium-pressure pipelines to final consumers. Other services related to distribution include storage, meter reading, invoicing and administration accounting.

[9] International Energy Agency, *Regulatory Reform: European Gas*, OECD/IEA, Paris, 2000, p. 11.

[10] Bisio, A. and Boots, S., *The Wiley Encyclopaedia of Energy and the Environment*, vol.1, Wiley, New York, 1997.

[11] WTO, *Energy Services, Background Note by the Secretariat*, S/C/W/52, 9 September 1998, p. 4.

reform plans in the sector include some degree of separation between grid management and the generation of electricity to prevent former monopoly utilities from retaining privileged access to the grid for their own electricity transactions.

12. Wholesale buying and selling of electricity may be regulated either by bilateral contracts or by a pooling mechanism which functions as a predetermined multilateral contract amongst market participants. The power pool is an open-access, competitive market for electrical energy, which functions like a stock market. The idea of establishing competitive wholesale markets for electricity is gathering momentum: electricity pools are now in operation in several European countries, in the province of Alberta, Canada (see box 2), and in Australia, Chile and Argentina. Power pools need to be carefully structured through regulations to guarantee open and non-discriminatory access to the pool to all players and to prevent the abuse of market power (see box 3).

Box 2
Power pools: Alberta's experience

An electrical energy power pool has been operating in Alberta since January 1996. For every hour of the next day, suppliers offer power to the pool at various prices and in various quantities. Suppliers include marketers, independent power producers and importers. At the same time, purchasers (i.e. retailers, direct access customers and exporters) put in their bids indicating how much power they are willing to buy at different prices. Bids are ranked from highest to lowest according to willingness to pay. These bids and offers form the basis for a forecast of how much power will be needed on the system during a specific hour and what generating units will be brought on line to meet the demand on the system. A single price is declared for each hour and all energy is traded at the declared pool price for the hour. In this system, the lowest-cost generators are used first and the more expensive ones are brought in only as necessary to handle a higher load. The pool was set up under the Electric Utilities Act. An independent Power Pool Council governs the pool and is responsible for its operation. In addition, an independent Transmission Administrator oversees the use of the transmission system by buyers and sellers to ensure fair rates, non-discriminatory access for all market participants and the safe and reliable operation of the system. However, very significant spikes in electricity prices occurred during the last trimester of 2000 and the first trimester of 2001 as a result of a lack of new generation capacity. While there is an expectation that industry will eventually respond with new capacity, the Government of Alberta has been subject to heavy criticism from many quarters for mishandling the transition to a new deregulated environment

Source: Alberta Department of Resource Development, Power of Competition, website www.resdev.gov.ab.ca/electric/rgeneral/poc-5htm.

13. Services firms are now specializing in wholesale purchases of electricity on behalf of end customers. Several sites are nowadays available to provide direct trading and brokering services of electricity and other energy products.[12] Traders and brokers of electricity aggregate supplies of energy, trade one form of energy for other energy forms or services; for instance, they provide supplementary energy during peak hours of

[12] A large North American company is reporting about 550 million transactions carried out on-line in 2000. Another company that matches buyers and sellers of electricity, gas and similar products reports about US$ 1.5 billion a month in transactions.

electricity use.[13] Energy services companies are offering packages of goods and services aimed at energy savings, identifying and evaluating energy-saving opportunities which are paid for through savings.[14] The establishment of most wholesale electricity markets has been accompanied by the development of financial markets to manage the risks inherent in any commodity trading. Effective financial markets for electricity have become a crucial tool in the management of price fluctuations.

14. Electricity can be regarded as both a good and a service. Although the drafters of the General Agreement on Tariffs and Trade (GATT) chose not to classify it as a good, some GATT Contracting Parties later included electricity in their tariff bindings. While the Harmonized Commodity Description and Coding System (HS) developed by the World Customs Organization (WCO) considers electrical energy a commodity, it is an optional heading, so that WCO countries are not required to classify it as a commodity for tariff purposes, which reflects the fact that some countries do not regard it as a commodity but a service.[15] In the Canada-United States Free Trade Agreement and the subsequent North American Free Trade Agreement (NAFTA), electricity is subject to the disciplines on trade in goods. At present, most agree that the production of primary and secondary energy does not constitute services subject to the GATS, but it results in goods whose trade is regulated by GATT rules. Transportation and distribution, on the other hand, are commonly regarded as services if they are provided independently.

Box 3
California's power crisis

Californians have been enduring a series of power emergencies during the first trimester of 2001 because the two leading State power utilities have been unable to buy power owing to financial constraints. Since October 2000, the utilities have been forced to buy power for far more (up to five times) than they are allowed to charge their retail customers; as a result, they have accumulated debts of over US$ 12 billion. Wholesale prices went up because of a shortage of supply and a surge in demand. Limited transmission capacity made it difficult to import electricity from neighbouring States. The impact of the supply squeeze was increased by structural rules which forced the utilities to buy all their power through a single market - the state's power exchange - no more than a day in advance. The intention was to prevent long-term contracts between

[13] Thompson, R., *Integrating Energy Services into the World Trading System,* Energy Services Coalition, April 2000, pp. 16 and 40.

[14] The following is an example of the kind of contractual arrangements that an energy services company (ESCO) may offer to a client. One such company announced in early May 2001 that it had been awarded a contract valued at almost US$ 6.5 million by a college in Los Angeles. The company is providing facility upgrades in 17 major buildings at the college that will lower energy costs and save about US$ 9.4 million. According to the terms of the contract, the company has to install new lighting throughout the campus to provide better lighting with lower energy costs. The company will upgrade existing heating, ventilation and air conditioning systems from constant use to system that will match usage requirements, thereby allowing the college to run equipment based on occupancy and schedule changes to save energy. The private company will also air-condition five additional buildings and add a thermal storage facility to produce chilled water at night when electricity costs are lower. The chilled water will then be used the following day during peak electricity demand periods when costs are higher. According to the company's Chief Executive Officer, the project will supply the college with better lighting and additional air conditioning, while providing substantial energy savings.

[15] WTO, *Energy Services, Background Note by the Secretariat*, *supra,* footnote 11, p.3.

the major players from limiting the scope of competition. The result was to introduce an element of price volatility that proved beyond the scope of financial planning. According to some, the present situation is the result of a liberalization process that was not very well conceived from the outset. When the electricity sector moved from a regulated to a market-based structure, there was an effort to take account of the concerns of all stakeholders - mainly the utilities, which wanted compensation for "stranded costs" (stranded costs – which are specific to the transition between regulatory regimes - are the unamortized costs of prior investments that are scheduled for recovery through regulated monopoly rates but would not be recovered under competition); consumer organizations, which wanted special treatment for particular groups to continue; and green organizations, which wanted environmental considerations to be given particular relevance and opposed the building of new generating capacity. As those concerns somehow conflicted with one another, the deregulated market was not allowed to work properly. On the other hand, since the power sector is extremely sensitive from social and economic points of view, it is difficult to reform it without heeding the positions of the main stakeholders. An additional lesson that can be drawn from California's experience is that reform is not just about competition, but also about adequate investment in generation and transmission, and that it should be accompanied by carefully planned regulatory structures. Developing countries that are implementing structural reform in their power sector have to keep in mind these problems, which may be more acute when financial and managerial resources are scarce and the number of households and industries that cannot afford to pay the proper price for electricity is large.

Sources: "The electricity crisis in California: Causes and consequences", *Oxford Analytica*, 30 January 2001; "California's Power Crisis", *Economist*, 20 January 2001; "When the lights go out", *Economist*, 20 January 2001; "Light on solutions", *Economist*, 13 January 2001; "Serious flaws hinder power market", Energy & Utilities Review, *Financial Times Special Report*, December 2000.

E. Nuclear power

15. In the 1970s, nuclear power appeared to be a stable and economic source of energy. Its growth, however, has since stalled, on account of lower fossil-fuel prices and increasing public concern.[16] Nevertheless, an increasing number of experts now believe that it will have to be seriously considered if the world is going to meet the forecast sharp rise in energy demand and reduce carbon dioxide emissions. The main nuclear services, usually provided by different suppliers, relate to the transformation process; engineering and project management services; inspection and maintenance services; nuclear safety services; services related to the disposal of nuclear fuel wastes; research and development (R&D).[17]

16. Article XIV bis of GATS includes among the security exceptions Members' action to protect essential security interests "relating to fissionable and fusionable materials or the materials from which they are derived". It is unclear whether an essential security

[16] International Energy Agency, *World Energy Outlook, 2000 edition*, OECD/IEA, Paris, pp. 354 and 356.
[17] The transformation process refers to uranium procurement, the conversion of uranium oxide into uranium hexafluoride, nuclear power enrichment services, fuel fabrication, and production of secondary energy from nuclear reaction.

interest could be at stake in the international trade in nuclear energy services for peaceful purposes.[18]

F. Renewable energies

17. Renewable energies include non-hydro renewables such as bioenergy, thermal and photovoltaic solar energy, wind energy, mechanical and thermal ocean energy, and geothermal energy. Small and micro hydro applications are also included within the common definition of renewables.[19]

18. Renewable energies are more evenly distributed than conventional energy sources and tend to be more environmentally friendly. The current installed renewable capacity reflects only part of the estimated potential.[20] The capital, skills and technology that will be required as countries shift to renewable energies to meet part of their energy shortfall and achieve environmental goals may be expected to lead to an increasing demand for activities such as engineering, consulting, R&D, design, feasibility study, environmental impact assessment and environmental monitoring.

19. Non-commercial energy accounts for about 2 per cent of energy consumption in industrialized countries, but an average of 30 per cent in developing countries. In some low-income developing countries, traditional biomass accounts for 90 per cent or more of total energy consumption.[21]

III. INTERNATIONAL TRADE IN ENERGY SERVICES AND TRADE BARRIERS

20. Energy services may be traded through Modes 1 (cross-border trade), 3 (foreign commercial presence) and 4 (movement of natural persons). Mode 1 is of relevance particularly for on-line trading and brokering services and professional services which can be delivered by mail or electronically, such as consulting and legal services. It also covers services related to the cross-border transmission of electricity and gas through pipelines and interconnected grids. Mode 3 is of paramount importance since it covers all different forms of foreign commercial presence, such as BOT and IPP.[22] Mode 4

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[18] WTO, *Energy Services, Background Note by the Secretariat*, *supra*, footnote 11, p. 7.

[19] International Energy Agency, *World Energy Outlook, 2000 edition*, *supra*, footnote 16, p. 291; International Energy Agency, *Renewable Energy Policy in IEA Countries*. Volume I: Overview. OECD/IEA, Paris, 1997, p. 37.

[20] In the case of India, biomass and waste potential stands at 17 GW, with an installed capacity of 49 MW; small hydro potential accounts for 10 GW, the installed capacity dropping to 271 MW; estimates place ocean potential at 50 GW, with no installed capacity. International Energy Agency, *World Energy Outlook. 2000 edition*, *supra* footnote 16, pp. 329-30 (estimates referring to renewable capacity and potential in 1999).

[21] *World Energy Assessment*, *supra*, footnote 1, p. 4.

[22] In the BOT (built-operate-transfer) system, a Government invites the contractor to finance a power facility, to build it and to operate it and to sell the output to the national system over a period of time long enough (usually 20 years) for it to recover its costs and earn an appropriate return on its investment. When this period expires, the ownership of the plant is transferred from the builder-operator to the host Government, which continues to operate it. In the IPP (independent power producer) system, a generating plant sells its output to the system and operates in compliance with the system, but is not owned by it. An IPP owner-operator is under no obligation to surrender title to the plant during its lifetime, or limit its

includes the movement of skilled professionals who deliver technical and managerial services, as well as the movement of semi-skilled and unskilled personnel needed, for example, for the construction and upgrading of facilities and grids.

21. Suppliers of energy services face barriers to trade in services common to other sectors, such as, for Mode 1, the need to have a local professional certify the legal, engineering or consultancy work provided from abroad. In the case of Mode 3, barriers include limitations on foreign share, nationality requirements for top officials and/or the majority of directors, limited possibilities for foreigners to use the courts in the event of disputes with local partners, limitations on foreign ownership of facilities or land, preference for local firms and public procurement rules. For Mode 4, barriers include difficulties in obtaining visas and work permits, non-recognition of professional qualifications obtained abroad, time limitations on the presence of foreign experts and economic needs tests.

22. Trade barriers specific to the delivery of energy services include, for Mode 1, limited access to the transmission grid, limited transit rights, unfair or non-transparent transmission fees, cross-border trading of energy subject to commercial presence, and limitations on the cross-border transfer of capitals to finance energy-related transactions. For Mode 3, specific limitations may include difficulties in gaining unrestricted access, at a competitive price, to transmission and distribution networks due to pre-existing exclusive rights and monopolies (the same happens in many other services sectors, such as air transport and telecommunications). In view of this, liberalization of trade in energy services might require some competitive safeguards aimed at ensuring access to scarce network facilities (see box 4). A typical practice used by established players is enforcement of temporary rate cuts to hinder new entrants from building their business strategy. One way of combating such practices is to impose a floor, rather than a ceiling, on prices. The State of Texas, for example, which began the process of deregulating the electricity sector in 1999, is fostering competition by extending rate regulation on existing utilities for the first five years of deregulation.[23] Non-transparent regulatory frameworks are perceived as trade barriers. Since some segments of the energy sector rely on considerable investment that can only be recouped in the long run, limitations on ownership and control of utilities represent serious barriers to the establishment of foreign firms.

Box 4
The single market for electricity in the European Union

Electricity production in the European Union (EU) has for decades been based on monopoly production and 15 separate, national markets. In December 1996, after eight years of negotiations, Directive 96/92 EC was adopted (OJ L 27, 30.1.1997) with the aim of contributing to the three energy policy objectives of the EU, namely increased competitiveness, improved environmental protection and greater security of energy supplies. The Directive concerns access to the grid, mechanisms for entry into power generation and access by some end-users to

earnings to any level previously agreed with the Government. It is, therefore, under significantly less stringent control by the host Government than under the BOT system.

[23] "The electricity crisis in California: The impact on deregulation initiatives in other States", *Oxford Analytica*, 30 January 2001.

alternative EU power generators or suppliers. In consideration of the major restructuring that companies have to undergo to adapt to the new competitive environment, the Directive allows countries to progressively open their markets. It indicates three dates for liberalization: 19 February 1999, when at least 26 per cent of national electricity demand had to be liberalized and consumers of more than 100 gigawatt hours (GWh) per annum ("reference size") were permitted to choose their supplier; 19 February 2000 (at least 28 per cent of national electricity demand had to be liberalized and the "reference size" was set at 40 GWh); and 19 February 2003 (at least 33 per cent of national electricity demand will have to be liberalized, and the "reference size" will be set at 9 GWh). Most member States, however, are moving faster than the Directive requires. This type of phased opening may produce interesting dynamic effects. Since users of the same size may be subject to very different rules in the purchase of electricity, and if liberalization does indeed result in substantial price decreases, firms that compete in the downstream market (the goods market) may well pay very different prices for electricity. To the extent that this has important effects on overall profitability, users in less liberalized member States may exert pressure for greater domestic liberalization. The same phenomenon may happen at the broader, international level.

At the European Council meeting held on 23 and 24 March 2001, the general objective of opening national markets for gas and electricity was endorsed, but the EU Commission's plan to set 2005 as the date for allowing all Europeans to choose their supplier of electricity and gas was rejected. The EU Heads of Government, however, agreed that the Commission could use competition law to put pressure on countries to liberalize their markets and to stop monopoly suppliers from competing unfairly in open markets in other EU countries.

Despite the liberalization process, barriers to trade exist and real competition remains limited. It has proved very difficult to combat the market power of former national monopolies and oligopolies, which continue to dominate most local markets. Gaining uncontrolled access, at a competitive price, to transmission and distribution networks remains a problem, particularly where these are controlled by large integrated companies which have a vested interest in keeping rivals from using the networks. Also, complex cross-shareholdings linking large regional generators and transmission operators to local municipally controlled utilities have created strong alliances, which have proved a powerful barrier for potential new entrants to overcome. Harmonization of transmission fees will be crucial if cross-border electricity sales are to increase and erode the market power of the dominant local suppliers. Efforts to replace national and regional charges with a single fee were halted in November 2000 because of disagreement among member States. Congestion of national grids also inhibits free trade. Finally, cross-border takeovers, mergers and joint ventures are occurring in Europe at a very rapid pace, more than in any other region, as companies strive to protect their share of national markets and gain a share in other member States. There is a fear that large-scale energy mergers will lead to a situation where national monopolies and oligopolies will be replaced by a single market dominated by six or seven mega utilities. Despite the efforts of the European Commission, corporate restructuring in the EU energy sector seems to be outpacing market liberalization.

According to some, it is likely that the model of liberalization worked out in the EU will be be adopted by other countries; therefore, companies which are willing to explore new markets may have to cope with the kind of market access difficulties described above. European companies, on the other hand, which are acquiring experience in expanding their business into other markets within the EU will use their expertise in the sector to become stronger players in the international market and may leverage their dominant positions in the EU market to export services to foreign liberalized markets.

Sources: European Commission, "Guide to the Electricity Directive", website: http://europa.eu.int/comm/energy/en/elec_single_market/memor.htm; International Energy Agency, *Electricity Market Reform: An IEA Handbook*, Paris, OECD/IEA, 1999; "Setback for single energy market plan: EU summit leaders in discord over liberalisation dates", *Financial Times*, 26 March 2001; "Competition proves illusive: European electricity", *Financial Times*, 13 December 2000.

IV. ENERGY SERVICES IN GATS

23. The WTO "Services Sectoral Classification List" (document MTN.GNS/W/120) does not include a separate comprehensive entry for energy services. Although the United Nations Provisional Central Product Classification (CPC) does not list energy services as a separate category, its Annex I provides a compendium of energy related-products listed under different headings in the CPC, including energy-related services. Additionally, important energy services cut across existing sectoral classifications. Architectural and engineering services, scientific and technical consulting services, construction services, wholesale and retail trade services with respect to fuels and energy equipment, transportation services and several financial services are, among others, the subsectors and sectors that might be relevant to the energy sector. In addition, three specific energy-related activities are explicitly listed as separate subsectors in the WTO classification list.

24. Two entries are related to petroleum and gas. One is "transportation of fuel" under the broad category of Transport Services. The CPC describes it as "transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas" (subclass 71310). The second entry is "services incidental to mining", which falls under the category of Other Business Services and relates to upstream activities for oil and gas. The CPC describes it as "services rendered on a fee or contract basis at oil and gas fields, e.g. drilling services, derrick building, repair and dismantling services, oil and gas well casings cementing services" (Division 88). However, mineral prospecting services, oil and gas field exploration and seismic and geological surveying services are excluded from this Division and are classified under "Geological, geophysical and other scientific prospecting services" (subclass 86751), under "Related scientific and technical consulting services" (class 8675).

25. The third specific entry relates to downstream activities for gas and electricity: "Services Incidental to Energy Distribution" (CPC 88700), under "Other Business Services". It refers to "transmission and distribution services on a fee or contract basis of electricity, gaseous fuels and steam and hot water to household, industrial, commercial and other users".

26. As the energy sector consists of a chain of interrelated activities, an energy services supplier may need market access in a number of relevant services sectors in order to provide his/her service adequately. As these services are spread throughout the classification system, the access conditions in a given market may be unclear and create unpredictability regarding the possibility of delivering the energy service effectively. On the other hand, commitments may be made with respect to other sectors which could have unforeseen implications for the energy sector. With respect to those subsectors that can be clearly identified as energy services, the existing commitments that WTO Members have undertaken are very limited (see Annex). Other relevant commitments can be found in the services sectors that cover, among others, energy-related activities, and in the horizontal commitments applying across all sectors.

V. THE ONGOING DEBATE IN THE WTO

27. The WTO Committee on Specific Commitments (CSC) has focused on whether there is a need to create a specific sector for energy services.[24] The United States proposal of May 2000[25] advocates a comprehensive classification of energy services covering the entire chain of these services, to serve as a basis for a model schedule to enable WTO Members to undertake commitments across the entire range of sectors covered by the model schedule.

28. At the time of publication of this note, six proposals on energy services had been tabled in the framework of the ongoing services negotiations. The United States builds upon its earlier submission and includes an "Index for Classification of Energy Services", to identify broad categories that contain energy services, under both the W/120 and the CPC Provisional Classification lists, including "architectural services", "engineering services", "management consulting services", "installation work", and "wholesale trade services". The proposal suggests that the index be used to negotiate the broadest possible market access and national treatment commitments. It encourages countries to allow the temporary entry of the highly specialized personnel necessary for the delivery of energy services, to liberalize the movement of electronic information and transactions and, should negotiations on goods begin, to consider the elimination of tariffs on energy-related goods.[26] This approach has been confirmed in the recent recommendations by the National Energy Policy Development Group for a national energy policy in the United States which includes a specific recommendation for a sectoral trade initiative to expand investment and trade in energy-related goods and services. These recommendations identify energy-producing countries, both WTO Members (e.g. Venezuela, Qatar, United Arab Emirates) and countries which are in the process of accession to the WTO (e.g., Algeria, Azerbaijan, Kazakhstan, Saudi Arabia, Russian Federation), from which improved access for trade and investment in energy services will be sought.

29. The European Communities (EC)[27] propose a number of sectors and subsectors where commitments should be made in all modes of supply, covering a broad spectrum of services related to exploration and production; construction of energy facilities; networks; storage; supply; services for final use; decommissioning; and other energy-related services, such as installation, maintenance and repair of energy equipment. The EC proposes to hold further discussions on how to improve and facilitate the temporary movement of natural persons for the provision of specific services, including the movement of contractual service suppliers.

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[24] The debate is reflected in WTO documents S/CSC/M/15-16-17, 18/Rev.1, 19 and 20.
[25] WTO Committee on Specific Commitments, *Communication from the United States. Classification of Energy Services*, S/CSC/W/27, 18 May 2000.
[26] WTO, *Communication from the United States. Energy Services*, S/CSS/W/24, 18 December 2000.
[27] WTO, *Communication from the European Communities and Their Member States. GATS 2000: Energy Services*, S/CSS/W/60, 23 March 2001.

30. The proposal by Canada[28] differs from the United States and EC proposals in that it avoids addressing the issue of downstream energy markets and focuses mainly on upstream oil and gas services, encouraging WTO Members to broaden and deepen their liberalization commitments in all four modes of supply. In addition to the specific entry "services incidental to mining", services related to oil and gas can be found in other sectors and subsectors of the existing classification list (e.g. real estate services, rental/leasing services, scientific and technical consulting services); Services related to the energy sector could be subject to a "checklist" that Members may use as an aide-mémoire during negotiations.

31. Norway[29]suggests that, in order to realize fully the benefits of efficient and competitive energy services and to make economically meaningful commitments as regards market access and national treatment, the entire chain of activities involved in resource identification, production, transmission, transportation, distribution, sales and marketing should be considered. A preliminary "checklist" for energy services, to be used as a negotiating tool to assist Members in scheduling commitments, includes engineering services, computer and related services, R&D services, management consulting services, wholesale trade services and environmental services. Since several of the services included cover activities with dual or several end-uses, the reference is limited to the energy-relevant component of the activities.

32. The Venezuelan proposal,[30] based on the principles of flexibility and specificity of energy sources, suggests a classification of the energy services sector according to three criteria: the sources of energy (e.g. oil, gas, hydropower); the phases of the energy process (e.g. services related to transport, distribution, and sales); and a distinction between "core" energy services, which are those directly involved in the main processes of the value chain, and the "non-core" services, which are related to processes which support this chain. This detailed classification would represent the precondition for WTO Members to schedule liberalization commitments in this strategic sector, and would preserve flexibility for countries to liberalize their markets according to their national development strategies. Negotiations on energy services would be linked to the achievement of development objectives for developing countries, mainly their ability to continue to use energy services as a lever to diversify their economies, promote their development and strengthen their private sector

33. Chile[31] suggests that negotiations should include the whole spectrum of energy services related to the electricity and hydrocarbons industries - those related to generation, transformation, transport, distribution and supply - and stresses that subsidies play an important role in the energy sector and hamper the development of open and competitive markets. The issue of subsidies should be addressed in the negotiations on the liberalization of the energy services sector.

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[28] WTO, *Communication from Canada. Initial Negotiating Proposal on Oil and Gas Services*, S/CSS/W/58, 14 March 2001.
[29] WTO, *Communication from Norway. The Negotiations on Trade in Services*, S/CSS/W/59, 21 March 2001.
[30] WTO, *Communication from Venezuela. Negotiating Proposal on Energy Services*, S/CSS/W/69, 29 March 2001.
[31] WTO, *Communication from Chile. The Negotiations on Trade in Services*, S/CSS/W/88, 14 May 2001.

34. These proposals are based on the assumption that improved market access in the energy services sector can have beneficial effects for all countries; that negotiations on the liberalization of the energy services sector should not address the issue of ownership of natural resources; and that the energy sector will continue to be regulated to ensure the achievement of public goals. They acknowledge that countries are in different phases of regulatory development, and that their commitments will therefore reflect the levels of existing market reform.

35. The Norwegian and Venezuelan proposals refer to the need to promote trade for all and to secure a share of international trade for developing countries. The United States and Norwegian proposals call for the development of a reference paper, similar to the WTO Reference Paper on Basic Telecommunications, whose purpose would be to ensure transparency in the formulation and implementation of rules, and non-discriminatory third-party access to and interconnection with energy networks and grids, and to prevent anti-competitive practices for energy services in general. The EC proposal omits reference to the need for a reference paper, but invites WTO Members to establish an appropriately transparent, objective and pro-competitive regulatory framework for the energy services sector. The EC and the United States refer to energy activities irrespective of the energy source, regardless of the political and strategic sensitivities and the existence of different regulatory regimes. The United States recommends tariffs elimination for energy-related goods.

36. The United States' proposal refers to the concept of "technological neutrality", a concept introduced in the negotiations on basic telecommunications, to the effect that where no specific references are made to the type of technology used in providing basic telecommunications services, specific commitments would automatically cover all means of technology, i.e. services transmitted via all types of cable, wireless or satellite. Nevertheless, where different measures were applied by WTO Members in regulating market access or national treatment, depending on the type of technology, Members scheduled them in their commitments.

37. The sectoral approach is seen by its different proponents as serving different purposes, and first of all, simply as a means of facilitating greater coherence in negotiations by enabling negotiators to have a clearer view of the economic and business interrelationships among subsectors when making specific commitments. Some proposals are more ambitious, aiming at achieving the maximum degree of liberalization commitments within the sector, as was the case, for example, with the post-Uruguay Round financial services and basic telecommunications negotiations. The sectoral approach also permits the negotiation of additional regulatory provisions. The WTO Reference Paper on Basic Telecommunications was drawn up in recognition of the fact that the liberalization commitments made in that sector required additional provisions specific to telecommunications (interconnectivity), intended to ensure that those commitments resulted in effective access to the market. It has been suggested that the transmission of electricity and gas has many aspects in common with telecommunications and that a reference paper with a similar objective should be negotiated. It has also been suggested that additional regulation could secure the effective implementation of Article XIX:2 and, by implication, Article IV of GATS to ensure that the supplying developed country firms provide access to technology and to distribution channels and information networks as a condition for enjoying the access to

markets provided in commitments made in the sector. Public services obligations could also be included in a reference paper.

VI. IMPLICATIONS FOR DEVELOPING COUNTRIES

38. Developing countries are thus faced with the challenge of achieving more reliable and efficient access to energy, while obtaining a greater share of the energy "business". Pursuit of both goals requires access to the knowledge, expertise, technology and managerial know-how that will allow developing countries to continuously improve their energy sector and to benefit from their natural resources.

39. Developing country energy producers are major importers of traditional energy services, such as services related to oil and gas exploration, wells and pipelines construction, drilling services and derrick erection. The provision of these services, which tend to be increasingly sophisticated and technology-intensive, is often beyond the capacity of developing countries. Those countries have made few commitments in this subsector in their GATS schedules, and thus still have flexibility to liberalize where liberalization is deemed to be most consistent with domestic energy policy objectives, and to seek substantial reciprocal concessions.

40. Only a limited number of developing countries have experience of structural reform in the energy sector; consequently, they have not developed those emerging energy services that usually emanate from the breaking up of integrated energy systems and the introduction of competition, especially in the gas and electricity segments. The design of effective domestic energy policies would be promoted by a better understanding of the experiences of countries that have implemented reforms in their energy sectors and permitted the emergence of competitive energy markets. Additional emerging services include those related to greenhouse gas emissions reductions and trading of emission rights (see box 5).

Box 5

Emerging energy services and emissions trading

A major issue that has implications for the energy services sector and for development relates to the global warming potential of greenhouse gas emissions and to the strategy designed to address that threat. The instrument central to that strategy is the Kyoto Protocol of 1997, which sets legally binding emission limits and reduction commitments for member countries of the Organization for Economic Co-operation and Development (OECD) and countries with economies in transition. Emission reductions should be primarily achieved through domestic actions. Additionally, the Protocol allows Parties to meet part of their commitments through reductions abroad using International Emissions Trading (IET), Joint Implementation and the Clean Development Mechanism (CDM). The latter is the only vehicle for trading emissions with developing countries (global trading). These mechanisms would improve the cost-effectiveness of emission reduction by exploiting country differentials in marginal abatement costs. At present, there is a fundamental disagreement about the share of reduction that should be accounted for by the flexible mechanisms. The lack of convergence between the position of the EU and that of the United States on the relative importance of domestic measures and flexible mechanisms for the purpose of achieving reduction commitments was one of the factors that led to the failure of the Sixth Conference of the Parties to the UN Framework Convention on Climate Change (COP 6) at The Hague in November 2000.

At present, the United States' opposition to the Kyoto targets makes the future of the agreement very uncertain. However, many believe that a way to break the deadlock is through a more flexible interpretation of the Protocol which would leave more room for emissions trading. A lucrative service sector may therefore develop in relation to the trading of emissions rights. The complexities involved in conducting, monitoring, verifying and enforcing emissions trading schemes and in designing and implementing project-specific crediting programmes allow a considerable margin for the market development of various services activities. Both the IET and the CDM are expected to achieve sizeable market significance, and emissions trading as a whole is expected to become one of the largest commodity markets in the world. The potential CDM market size is estimated to be in the range of US$ 5 to 10 billion per annum financial flows to developing countries. However, much of this enormous market potential depends on the strategies that will be pursued to combat climate change.

Services under the CDM facility would mainly consist of project-specific activities related to the design and implementation of the underlying project (e.g. environmental and social impact assessments, seeking host Government approval and permits); services related to the crediting mechanism (e.g. registration of the project for crediting by a CDM operational entity; monitoring and keeping of records of net emissions; certification of emissions reduction; sharing of credits and other project proceeds among investors); and services activities aimed at ensuring that the project favours sustainable development in the recipient country (e.g. verification of compliance with specified eligibility criteria as a precondition for project registration and credit certification; transfer of technology).

The early experiments in emissions trading have underlined the key role played by large consulting firms from industrialized countries in setting up the market infrastructure and in framing the individual deals. Therefore, the trading of emission entitlements, although favouring considerable financial transfers to developing countries, is likely to represent a business opportunity primarily for services suppliers from the developed world. Most services involved are in fact complex activities with substantial expertise requirements and are at present beyond the capacity of developing countries.

The risk that developing countries will be passive recipients of financial flows rather than proactive architects in the design of the emissions market has some important implications in relation to the achievement of CDM objectives, namely providing cost-effective compliance options for developed countries and helping developing countries to achieve sustainable development. The equitable achievement of these dual objectives, however, is likely to depend heavily on how individual transactions are actually shaped. The services component becomes crucial to this purpose. The lack of domestic service capability in the emissions field and the heavy reliance on external expertise from developed countries might lead to a situation where cost-efficient commitment compliance and development are not pursued on an equitable basis.

Sources: "Europe's air of self-righteousness", *FT.com* site, 19 December 2000; "Hot air about global warming", *FT.com* site, 29 November 2000; Vrolijk, C., *The Potential Size of the Clean Development Mechanism*, Second International Conference, Emerging Markets for Emissions Trading, London, 26-27 April 1999, website: http://www.riia.org/Research/eep/eeparticle.html; UNCTAD, UNDP, UNEP and UNIDO, *The Clean Development Mechanism: Building International Public-Private Partnerships under the Kyoto Protocol: Technical, Financial and Institutional Issues*, Geneva, United Nations, July 2000, p. 9.

41. A series of issues would seem to confront developing countries in the multilateral negotiations on services. With respect to **classification**, a sufficient degree of precision in the definition of "energy services" would facilitate an approach whereby negotiations of specific commitments could be undertaken in a manner consistent with energy policy

objectives. Another issue would be whether **additional provisions**, reflecting the specificity of the energy services sector, could be attached to the liberalization commitments. Such specificities could relate to the *interconnectivity aspects* of energy transmission and distribution (the relevance of the WTO Reference Paper on Basic Telecommunications has been mentioned) and to the importance of *GATS Article IV provisions*, such as transfer of technology and access to distribution channels and information networks, with a view to increasing the competitiveness of developing country firms in the supply of energy services. An additional set of conditions could aim at ensuring that where foreign enterprises are permitted to operate in liberalized energy markets in developing countries a set of *"public services" obligations* could be attached (see box 6). The inclusion of these conditions in an Annex or Reference Paper applicable to the sector could ensure that developing countries could obtain benefits they might not be able to effectively negotiate with stronger trading partners, or investors in a bilateral context. The objectives would be (a) to "level the playing field"; (b) to link in a clear manner energy and development, including the achievement of public services goals; and (c) to prevent developing countries from competing among themselves to attract investment in the energy sector by lowering their requirements vis-à-vis foreign providers.

Box 6
Public services in the electricity sector

Energy markets alone cannot be expected to meet the needs of the most vulnerable groups of the population or to protect the environment. Targeted government policies are therefore needed in order to harness market efficiencies to the protection of public goals.

Several Governments consider electricity a public service; but the question is what is happening to public services in a liberalized system in which firms (domestic and foreign) compete for business.

Since one of the main problems that developing countries wish to tackle by liberalizing their power market is the inadequacy of electrical supply, they may consider including a clear reference to the provision of public services when private actors are in charge of supplying electricity. Qualifications to market access commitments under the GATS could focus on measures aimed at ensuring equity, such as maximum prices for consumers, uniform fees charged across all regions regardless of costs, and provision of energy supply to remote rural areas even if unprofitable. However, if developing countries compete among themselves to attract private investment in the power sector, companies may be reluctant to accept public service obligations because of developing countries' weak capacity for including public service obligations in their investment agreements and deregulation policies.

42. As described above, the growth of the energy services sector can be attributed to the increasing demand for energy combined with the externalization of activities, first at the upstream stage by transnational enterprises, and more recently at the downstream stage, through increasing competition and demonopolization particularly of the gas and electricity segments. Some oil-producing and exporting developing countries have not only been able to encourage the creation of a specific energy services sector, but have also strengthened the supply capacity in other service sectors supplying the oil industry (see box 7). These approaches might be replicated by other developing countries.

43. In developing countries, the construction of utilities such as power plants and hydro-electric stations is largely financed by multilateral or bilateral assistance programmes. However, local firms are very often excluded from the bidding procedures because they do not meet the pre-qualification requirements set by the financial institutions. A primary concern for developing countries is to improve the competitiveness of their firms so that they can compete successfully in the multilaterally or bilaterally financed construction projects in their countries. Once they have accumulated expertise and strengthened their competitiveness, these may be translated into export capacity.[32]

Box 7

Construction services related to energy: The case of PDVSA

Venezuela is the second largest energy producer in the Western hemisphere, but it is also the second largest consumer of energy-related services, including physical construction services and engineering services.

In 1980 there were only 25 engineering companies in Venezuela which had the capacity to develop medium-size projects of a value of between US$ 100 and 200 million. In 1992, Venezuela had 200 engineering companies with such a capacity, including 25 that had developed the expertise for managing complex projects. These companies have been increasingly able to provide the local oil company, PDVSA, with the kind of construction services that it needs for its activities. At present, 90 per cent of PDVSA's requirements in the engineering sector are met by local companies.

This situation is the result of a global strategy put in place by PDVSA to support the development of local capacity in all the sectors needed by the company for its operations. In the engineering sector, PDVSA encouraged the development of capacity and expertise by local firms and promoted partnerships with those foreign firms that were willing to transfer technology, train personnel and share their design and project control systems with local firms. However, many problems had to be addressed and solved before local engineering firms could qualify as adequate business partners for PDVSA. These problems included the inability of Venezuelan companies to deal with large and complex projects, their lack of financial leverage and the serious restrictions in the domestic banking system. Therefore, major projects were split into several "easy to handle" packages; joint ventures were implemented where human resources training was set as a central issue; and high standards were established in the areas of design, cost estimation, planning, construction and inspection.

Venezuelan engineering companies that provide services to PDVSA have diversified their activities and are at present also active in other industrial sectors, such as hydroelectricity and petrochemicals. However, they are not yet key players in the international market for energy-related construction.

Source: Presentation made by the representative of PDVSA at UNCTAD's Expert Meeting on Regulation and liberalization in the construction services sector and its contribution to the development of developing countries, 23-25 October 2000.

44. The Expert Meeting may wish to address the elements of an energy services sector strategy for developing countries, with the following objectives: (a) to ensure efficient access to energy by all segments of the population; (b) to strengthen their competitive position in the supply of energy services at the various stages of the energy chain; and (c) to negotiate commitments and additional provisions in the multilateral negotiations

[32] This was noted at UNCTAD's Expert Meeting on Regulation and liberalization in the construction services sector and its contribution to the development of developing countries (23-25 October 2000).

on trade in services supportive of these objectives. Under each of these broad headings a series of specific questions could be addressed:

- **(a)** (i) What kind of development policies should be pursued to ensure universal and reliable access to energy? (ii) How to ensure that Foreign Direct Investment in the energy sector benefits the overall development process? (iii) What kind of international cooperation should be envisaged for the achievement of these objectives? (iv) Does the deregulation of the energy service sector in industrialized countries provide opportunities for developing country exporters of energy services?
- **(b)** (i) How to implement domestic policies that enhance the competitiveness of the energy services sector in accordance with WTO commitments? (ii) What actions should be taken to ensure an adequate transfer of technology in favour of the energy services sector in developing countries?
- **(c)** (i) What key elements should be in the negotiations on energy services to ensure that there is compatibility with the objectives of Articles IV and XIX of GATS? (ii) Could complementary actions be taken at the regional level in pursuit of these development objectives? (iii) How to define negotiating objectives for energy services that would take account of the interests of both exporters and importers of energy?

ANNEX
Overview of the GATS commitments in energy-specific services subsectors:[33] Commercial presence[34]

Horizontal (affecting all industries) commitment[35]	
Bulgaria – for services relating to the use of nuclear energy for peaceful purposes. No commitment for services relating to the exploration, extraction and processing of fissionable and fusionable materials or the materials from which they are derived, as well as to trade therein, to the maintenance and repair of equipment and systems in nuclear energy production facilities, to the transportation of such materials and the refuse and waste matter from their processing, to the use of ionizing radiation, and to all other services relating to the use of nuclear energy for peaceful purposes (e.g. engineering and consulting services and services relating to software.). Full national treatment granted in this area. In *Iceland* non-residents are excluded from obtaining full property rights in respect of real estate if unusual rights are linked to it, such as exploitation rights relating to waterfalls, geothermal energy etc. In *Peru*, within 50 kilometres of the border foreigners may not under any circumstances directly or indirectly purchase or own mines, land, woodland, water resources, or fuel or energy sources, whether individually or as a company, on penalty of transfer of the rights thus acquired to the State.	
Transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas	
No sector-specific restrictions: (bound as "none")	*Australia, Croatia, Kyrgyzstan , New Zealand*
Some sector-specific restrictions or coverage of a limited scope:	*Hungary* – services may be provided through a contract of concession granted by the State or the local authority. *Brazil* – excludes fuels and hydrocarbon products.
Services incidental to energy distribution: transmission and distribution services, on a fee or contract basis, of gaseous fuels to household, industrial, commercial and other users	
No sector-specific restrictions: (bound as "none")	*Croatia, Georgia, Latvia, Nicaragua, Oman, United States*
Some sector-specific restrictions or coverage of a limited scope:	*Australia* and *Hungary* – limited to consultancy services. *Colombia* – design, construction, operation and maintenance of oil and gas pipelines. *Dominican Republic* – national treatment may not be granted. *Gambia* – conditions for market access are not specified, except that individuals/companies must be certified and registered by the professional associations or by the Registrar General's Office; subject to payment of fee and tax deposit, and to professional qualification of the individual. *Kyrgyzstan* – excludes electrical energy distribution.

[33] Based on a review of 131 schedules of GATS specific commitments. Where commitment for market access and national treatment is "unbound", it is excluded from the table. This also concerns a horizontal commitment by Bulgaria on nuclear energy.

[34] Commitments for the GATS movement of natural persons were mostly made at the horizontal level and only for a few categories of persons, mainly intra-corporate transferees and business persons. For detailed discussion of Mode 4 commitments, see *Positive Agenda and Future Trade Negotiations*, UNCTAD/ITCD/TSB/10, July 2000, pp. 193–207. At the sector-specific level as included in these tables, none of the countries have made provision for market access by specialists in any of the relevant categories for supply of the energy services (except Turkey for mining services).

[35] The following measure in the European Communities for Italy has expired: for a period of five years, the acquisition of large equity stakes of companies operating in the field energy may be subject to the approval of the Ministry of the Treasury.

	Sierra Leone – through joint venture only. *Slovenia* – for gas only.

Services incidental to mining: rendered on a fee or contract basis at oil and gas fields	
No sector-specific restrictions: (bound as "none")	*Albania, Argentina, Canada, Colombia* (broader coverage), *Ecuador, Georgia, Israel, Kyrgyzstan, Latvia, Malawi, Mongolia, Nicaragua, Oman, Pakistan, Panama, South Africa, Turkey, United States, Venezuela, Zambia*
Some sector-specific restrictions or coverage of a limited scope:	*Australia, Austria, European Union* (Spain and Portugal restrict access for mining engineers to natural persons), *Finland, Hungary, Republic of Korea, Singapore, Sweden* - for consulting services only. *Poland* – excluding exploitation of natural resources. *Switzerland, Liechtenstein* – excluding exploration, exploitation, prospecting and surveying services. *Dominican Republic* – national treatment may not be granted. *Thailand* – 49 per cent limit on foreign equity participation.

Overview of the GATS commitments in energy-specific services sectors:

Cross-border supply

Horizontal (affecting all industries) commitment	
Bulgaria – for services relating to the use of nuclear energy for peaceful purposes. No commitment for services relating to the exploration, extraction and processing of fissionable and fusionable materials or the materials from which they are derived, as well as to trade therein, to the maintenance and repair of equipment and systems in nuclear energy production facilities, to the transportation of such materials and the refuse and waste matter from their processing, to the use of ionizing radiation, and to all other services relating to the use of nuclear energy for peaceful purposes (e.g. engineering and consulting services and services relating to software). Full national treatment granted in this area. In *Canada:* Alberta – First consideration may be given to service suppliers from within Alberta or Canada where these are competitive in terms of price and quality in the case of all large-scale energy projects needing industrial development, forest management, oil sands, power plant or gas plant and coal development permits.	
Transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas	
No sector-specific restrictions: (bound as "none")	*Australia, Croatia, Kyrgyzstan, New Zealand.*
Some sector-specific restrictions:	*Hungary* – conditions for market access not defined.
Services incidental to energy distribution: transmission and distribution services, on a fee or contract basis, of gaseous fuels to household, industrial, commercial and other users	
No sector-specific restrictions: (bound as "none")	*Gambia, Georgia, Latvia, Nicaragua, Oman, Sierra Leone, United States*
Some sector-specific restriction or coverage of a limited scope:	*Colombia* – design, construction, operation and maintenance of oil and gas pipelines. *Côte d'Ivoire,* for energy generation – Enterprises must receive government approval. The criteria that must be satisfied in order to obtain approval may include the preferential use of local services if available under conditions of quality, price and delivery equivalent to those of like products of foreign origin. The employment and training of local executives and supervisors.

	Croatia – commercial presence required in order to access the market. *Dominican Republic* – national treatment may not be granted.

Services incidental to energy distribution: transmission and distribution services, on a fee or contract basis, of gaseous fuels to household, industrial, commercial and other users *(cont'd)*	
Some sector-specific restrictions or coverage of a limited scope (cont'd):	*Australia* and *Hungary* – limited to consultancy. *Slovenia* - for gas only. *Malaysia* advisory, guidance and operational assistance services concerning management of the transmission of non-conventional energy, through a locally incorporated joint-venture corporation with Malaysian individuals or Malaysian-controlled corporations, or both, and Bumiputra (i.e. indigenous Malay) shareholding in the joint-venture corporation of at least 30 per cent.
Services incidental to mining: rendered on a fee or contract basis at oil and gas fields	
No sector-specific restrictions: (bound as "none")	*Albania, Argentina, Canada, Colombia* (broader coverage), *Georgia, Kyrgyzstan, Latvia, Malawi, Mongolia, Nicaragua, Oman, Panama, United States, Zambia*
Some sector-specific restrictions or commitment of a limited scope:	*Australia, Austria, European Union, Finland, Hungary, Republic of Korea, Singapore, Sweden* - for consulting services only. *Poland* – excluding natural resources. *Dominican Republic* – national treatment may not be granted. *Switzerland, Liechtenstein* – excluding exploration, exploitation, prospection and survey services. *Turkey* – requires establishment; nationality for real persons.

Most-favoured-nation exemption in energy services

Country	Measure
United States of America *With respect to pipeline transport, due to lack of reciprocity*	Pursuant to the Mineral Lands Leasing Act of 1920, aliens and foreign corporations may not acquire rights-of-way for oil or gas pipelines, or pipelines carrying products refined from oil and gas, across onshore federal lands or acquire leases or interests in certain minerals on onshore federal lands, such as coal or oil. Non-United States citizens may own a 100 per cent interest in a domestic corporation that acquires a right of way for oil or gas pipelines across onshore federal lands, or that acquires a lease to develop mineral resources on onshore federal lands, unless the foreign investors' home country denies similar or like privileges for the mineral or access in question to United States citizens or corporations, as compared with the privileges it accords to its own citizens or corporations or to the citizens or corporations of other countries. Nationalization is not considered to be a denial of similar or like privileges. Foreign citizens, or corporations controlled by them, are prohibited from obtaining access to federal leases on Naval Petroleum Reserves if the laws, customs or regulations of their country deny United States citizens or corporations the privilege of leasing public lands. Applies to all countries.
Venezuela *With respect to petroleum-related services*	Bilateral agreement services relating to the distribution and marketing of petroleum and petroleum products, advisory services and exchange of technology, in which preferences are granted. Applies to Germany, France, Brazil, and Central American and Caribbean countries.