

**ESM219**  
**July 1999**  
*Global Energy Sector Reform in Developing  
Countries: A Scorecard*



Energy

Sector

Management

Assistance

Programme



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JOINT UNDP / WORLD BANK  
**ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAMME (ESMAP)**

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The Joint UNDP/World Bank Energy Sector Management Assistance Programme (ESMAP) is a special global technical assistance program run as part of the World Bank's Energy, Mining and Telecommunications Department. ESMAP provides advice to governments on sustainable energy development. Established with the support of UNDP and bilateral official donors in 1983, it focuses on the role of energy in the development process with the objective of contributing to poverty alleviation, improving living conditions and preserving the environment in developing countries and transition economies. ESMAP centers its interventions on three priority areas: sector reform and restructuring; access to modern energy for the poorest; and promotion of sustainable energy practices.

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# **Global Energy Sector Reform in Developing Countries: A Scorecard**

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**July 1999**

Joint UNDP/World Bank Energy Sector Management Assistance Programme  
(ESMAP)

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# Acronyms

|              |   |
|--------------|---|
| <b>EAP</b>   | East Asia and Pacific                       |
| <b>ECA</b>   | Europe and Central Asia                     |
| <b>ESMAP</b> | Energy Sector Management Assistance Program |
| <b>IPP</b>   | independent power producer                  |
| <b>LCC</b>   | Latin America and the Caribbean             |
| <b>MNA</b>   | Middle East and North Africa                |
| <b>SAR</b>   | South Asia                                  |



# Executive Summary

## Introduction

1. The need for reform of the energy sector in most countries is well documented and widely accepted. Losses due to inefficiencies, both commercial and technical, have placed large and unnecessary financial burdens on many developing countries. In turn, the losses associated with the sector have meant that governments, often facing macroeconomic problems and serious competing social demands for the use of budget funds, have been unable to finance much-needed investment in the sector. In some countries the inability to meet the need to improve the supply of energy to society, often in rural areas, is becoming a major hindrance to development.

2. Although this state of affairs has been evident for several years, only since about 1990 has there been a concerted effort, both by the international development organizations and by some governments, to improve the performance of the energy sector by introducing what has become to be known as *energy sector reform*.

3. Although a large number of countries have discussed energy sector reform, and detailed plans for reform now exist in several of these countries, it is less clear at a global level what steps have actually been taken. The purpose of the present study is to assess, country by country, the extent to which reform has been accomplished in developing countries. This assessment will indicate the extent to which reform still needs to be encouraged, as well as forming a reference point for subsequent evaluations.

## Scorecard Design

4. The assessment project, or scorecard, was based on a questionnaire completed by World Bank staff with experience in the energy sector in 115 countries. Six questions were asked about each of four subsectors: power, upstream oil and gas, downstream gas, and downstream oil. The six questions asked simply whether or not certain steps, crucial for obtaining the maximum benefits for energy sector reform, had been taken by mid-1998. The questions were these:

- a. "Has the utility [state owned enterprise] been commercialized and corporatized?"
- b. "Has an 'Energy Law' been completely passed by Parliament [a law which would permit the creation of a sector that could be unbundled and/or privatized in part or in whole]?"
- c. "Has a regulatory body started work [a body that is separate from the utility and from the Ministry]?"

- d. "Is there any private sector investment on greenfield sites<sup>1</sup> in operation, or under construction?"
- e. "Has the core state-owned utility been restructured/separated?"
- f. "Has any of the existing state-owned enterprise been privatized [including outright sale, voucher privatization or joint ventures]?"

5. Each question was answered by a "yes" or "no," with a "yes" counting for one point; thus countries could score between zero and six points for each subsector. The questions focus on a thoroughgoing reform whose final goals, following a number of intermediate steps, are to (1) introduce private sector ownership and investment where possible and (2) induce competition in those parts of the energy industries that are not natural monopolies. Both of these goals are aimed at utilizing the profit motive in order to remove cost inefficiencies, passing some of the benefits of this to consumers in terms of lower prices and better service, and reducing the drain on the government budget—which, in turn, allows the government to spend more on measures the private sector is unwilling to undertake.

## Results

6. The overall reform indicator shows that globally only 39 percent of the steps identified as necessary for a fully effective reform have been taken in the energy sector as a whole. Importantly, the reform movement has taken the most steps in the upstream oil and gas subsector, where 49 percent of the steps have been taken. Reform has been less successful in the other subsectors, however—notably power, which has attracted the most discussion in the energy community; in this sector only 34 percent of the steps have been taken.

7. These figures indicate that in the developing world a great deal remains to be done. Even assuming that each step were of equal difficulty and importance, only about one-third of the necessary movement has occurred. Because the steps are not of equal difficulty or importance, however, and because the gains from reform will also depend on substantial private sector involvement, the amount of progress still to be made is certainly understated by these figures.

8. Indeed, detailed examination at a global level of the pattern of steps taken reveals a further important finding: not all steps are equally likely to have been taken. In particular, only 24 percent of countries have allowed privatization of some of the existing assets of the energy sectors. In three-quarters of the countries surveyed, no existing state-owned assets had been privatized; where the upstream oil and gas subsectors were concerned, this figure was as high as 86 percent. Because the ultimate gains of reform stem from the entry of the private sector and competition into markets, the fact that so

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<sup>1</sup> A *greenfield site* refers to the construction of an entirely new plant, rather than the change in ownership of an existing plant or extension of capacity at an existing plant.

many countries have not even started to give themselves the chance to benefit from the benefits of competition, underscores the magnitude of what remains to be achieved.

9. The number of countries that have allowed the private sector to invest in greenfield sites is encouragingly high: 40 percent for the overall energy sector, with power at 40 percent and upstream oil and gas at 69 percent. The high latter figures reflect the high costs and risky returns associated with exploration and development, which governments in many small countries cannot afford to undertake themselves.

10. The survey further shows that, unfortunately, the entry of the private sector into greenfield site investment has not automatically brought with it other reform steps. Only one-half of the countries that had independent power producers (IPP) in the power subsector, or private-sector greenfield investment in the downstream gas subsector, had also established a regulatory body or passed an law permitting privatization. Similarly, in the upstream oil and gas subsector only one-third of the countries possessing concessions to explore and produce also had a law or a regulatory body. This suggests that the “Trojan Horse” strategy of encouraging private greenfield investment as a means of opening the sector to other reforms, and eventually to privatizing the existing state enterprise, has not been widely successful.

11. At the level of individual countries, the survey reveals huge differences in the amount of reform effected by the various countries. This is of considerable importance: it suggests that the factors predisposing or repelling a country from embarking on reform are specific to that country, since otherwise all countries would tend to be at a fairly similar stage. A few countries have taken reform seriously and have completed all the steps (even if they have not yet privatized the whole sector), whereas many countries have not taken even one step.

12. The regional groupings confirm the country-by-country findings. Some regions have almost uniformly adopted similar degrees of reform, notably the Latin America and Europe and Central Asia regions. The case of Latin America—where a substantial number of steps have been taken in both the power and downstream gas subsectors—suggests an important role for the demonstration effect of neighbors who have successfully reformed.

13. Again, however, the survey results understate what actually remains to be done to achieve extensive private sector operation of the energy sector in developing countries. Even the smallest sale of assets of an existing state-owned company is counted as a “success” for the purposes of the survey. In fact, to privatize the entire energy sector, or the non-monopolistic parts of it, will in many cases take much more time.





# 1

---

## Introduction

1.1 The need to reform the energy sectors of most countries is well documented and widely accepted. Losses stemming from commercial and technical inefficiencies have placed large and unnecessary financial burdens on the governments and populations of many developing countries as well as in the industrialized world. These losses have in turn prevented governments facing macroeconomic problems from financing much-needed investment in the sector. In some countries the inability to improve the supply of energy to the poorer members of society, often in rural areas, is a major hindrance to development.

1.2 Although this state of affairs has been evident for several years, only since about 1990 has there been a concerted effort, both by the international development organizations and by some governments, to improve the performance of the energy sector by introducing what has become to be known as *energy sector reform*. This involves a number of steps, but the final goals are to (1) introduce private sector ownership and investment where possible and (2) to induce competition in those parts of the energy industries that are not natural monopolies. Both of these goals are aimed at utilizing the profit motive in order to remove cost inefficiencies, passing some of the benefits of this to consumers in terms of lower prices and better service, and reducing the drain on the government budget—which, in turn, allows the government to spend more on measures the private sector is unwilling to undertake.

1.3 Although a large number of countries have discussed energy sector reform, and detailed plans for reform now exist in several of these countries, it is less clear at a global level what steps have actually been taken. The success of some high-profile countries in achieving extensive reform, especially in the power subsector, coupled with widespread planning for reform, has led some commentators to suggest that, globally, reform in the energy sector is well advanced. Other observers, focusing on different countries—perhaps with a greater emphasis on the oil and gas subsectors and the very poorest countries—have concluded that little has actually been achieved.

1.4 The purpose of this exercise is to construct a global assessment of the extent to which reform has been accomplished, country by country, in the energy sectors of developing countries. This assessment will indicate the extent to which the reform

process still needs to be encouraged, as well as forming a reference point for subsequent evaluations. Although similar surveys have already been carried out, they have been limited in important ways. Some have had a regional focus, so that much of the world has not been considered. Others have been sectoral (especially surveys on new investment in power), which gives only a limited view of what is need for full-scale reform in the power subsector, and nothing for other subsectors. Still other studies have taken a global approach, but have not been able to provide much detail for many of the poorer countries of the world.

1.5 This study has drawn on the specialized knowledge of World Bank staff experienced in working in the energy sector in a large number of developing countries. This means that the coverage is selective, in that it largely excludes developed countries where the Bank does not have an active lending program. Instead, it concentrates on those countries where the Bank plays a role in facilitating reform, and hence provides a unique picture of energy sector reform across the spectrum of developing countries.

1.6 As reflected in the term *scorecard*, the focus in this study is on the *number* of countries that have reformed (or not) rather than on any measure of reform within each country (e.g., percentage of assets sold) or on a measure that treats countries differently according to size. Although this focus is largely dictated by the difficulty inherent in collecting quantitative data in this sector, it does highlight the number of countries and governments that have yet to be persuaded of the value of pressing the energy sector reform agenda.

# 2

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## Methodology

2.1 The information on which this survey is based was gathered by means of a standardized questionnaire completed by World Bank staff possessing energy sector experience in as many countries as possible. Because separate versions of the questionnaire were administered for power, oil, and gas subsectors, and Bank staff do not always have experience in all three subsectors in a given country, it was often necessary to consult more than one staff member per country.

### Scorecard Design

2.2 Several steps are essential for a country to achieve a fully liberalized, competitive, self-financing sector that is capable delivering energy to users at low prices, driven by competitive forces where possible, and constrained by regulation where not. Of course, even the completion of all these steps may not ensure the most beneficial outcome possible. However, without one or more of these steps the reform will not be possible and/or effective. Each step requires a clear decision by the country government of the country to move away from the traditional state-enterprise model of supply and ownership and towards opening the market to private ownership. The more steps that have been taken, the more committed a government is likely to have been to obtaining the full benefits of sector reform. The scorecard establishes for each country how many of these steps have been undertaken.

2.3 Because the questionnaire was designed in April 1998 and administered from May through September 1998, the resulting data describe the state of affairs in mid-1998. However, since the reform process is continuous, the present scorecard will need to be updated periodically to maintain validity.

2.4 The scorecard's basic philosophy was to avoid ambiguity and bias by establishing whether or not a given reform step had been taken by a given country. Open-ended questions like "To what extent has reform taken place?" normally yield inconclusive, and possibly biased, answers such as "nearly" or "substantially" or "very little." By posing each question in a form requiring a "yes" or "no" answer, the

questionnaire avoids any pro- or anti-reform bias that might inform less precise statements. All questions were phrased so that taking a reform step would be answered by “yes” and not taking it by “no.”

2.5 For each of the five energy subsectors there are six questions, so that the maximum response is six “yes” answers. By treating the value of each “yes” as a score of one, and each “no” as zero, a numerical score for the extent of reform can be constructed on a scale from zero to six.

2.6 These considerations raise three issues of interpretation of the reform score:

- a. Are some steps more important than others?
- b. Do some steps add to the benefits of reform if others have not been taken?
- c. Is there an optimal sequence of steps?

2.7 The questionnaire approach does not attempt to judge these issues, and at this stage all steps are regarded as equally important. Further, their importance is independent of the sequence in which the steps have been taken, or of which other steps have been taken.

### **The Questionnaire**

2.8 The questions are given below for each sector, with a brief commentary on the reason why they are seen as central to the reform process.

(a) *“Has the utility [state owned enterprise] been commercialized and corporatized?”*

The first step in the reform process has two parts: (1) the removal of the utility from the direct control that results from being a part of a ministry and (2) the creation of an independent legal corporation with the goal of behaving like a commercial company (maximizing profits, for example). This step makes it more likely that costs can be reduced, efficiency improved, and tariffs raised towards covering costs (if necessary) so that the company becomes more attractive to potential purchasers. Although it is possible to move to the entry of new investment or the sale of the existing assets without commercializing or corporatizing the sector, it would be very difficult because the ability to transact with a part of the government, rather than a separate entity, would be very circumscribed.

(b) *“Has an ‘Energy Law’ been completely passed by Parliament [a law which would permit the creation of a sector that could be unbundled and/or privatized in part or in whole]?”*

This refers to a step that is seen as crucial to allowing the sale of a state utility to the private sector. Because most countries have also considered selling elements of the utility separately, in order to heighten competition while retaining natural monopoly elements (such as transmission) in public ownership, the law also needs to establish these elements as entities. The first two steps could be done in either order, before

privatization begins, but it is likely that a state company would need to be established first so that its relation to the private sector could then be defined.

It should be noted that the question specifically asks whether the law is completely passed, since many countries have started the process of drafting and validating a new law but have not enacted it, despite the passage of a considerable period of time. Only once the law has been passed can it be effective and have any impact on the performance of the sector, through encouraging the entry of new investments and ownership.

(c) *“Has a regulatory body started work [a body that is separate from the utility and from the Ministry]?”*

Regulation is not necessary to control investors in production on greenfield sites (e.g., IPPs in power or concessions in the upstream oil and gas subsector); these investors are likely to be bound by their contract to sell to the state enterprise and by the general legal framework. However, the existence of a regulatory body is likely to be extremely important if any of the existing assets are sold off, particularly where the sector has been unbundled. The arenas of pricing by producers, of pricing for access to the transmission system, of wholesale and retail pricing, and of the control of the quality of customer service, all need to be regulated wherever the sector is not fully competitive. Because monopoly elements remain even in countries with the most liberalized markets, the need remains for independent regulation. Since governments can directly control state-owned companies, this question focuses on the creation of a quasi-independent body responsible for regulating the sector. Again, the question focuses only on those cases where the regulatory body is actually in place.

(d) *“Is there any private sector investment on greenfield sites in operation, or under construction?”*

The entry of the private sector into the ownership of new investment has been seen as a crucial first step in the reform of the whole sector. A country that is willing to contemplate some private sector participation, even though it does not address directly the inefficiencies of the existing industry, may be more open to consideration of extensive reform. In the power sector, IPPs are likely to be efficient at providing power, and the contract to sell this power should be able to capture some of the benefits for consumers in terms of prices and reliability of supply. Further, in dealing with an IPP, the remaining state-owned company might be encouraged to improve its own operations, partly by the example set by the IPP. If this “Trojan horse” strategy is effective, the entry of IPPs should be observed to be associated with the presence of other reform steps. Countries where construction has not begun, even if there is a contract or a memorandum of understanding, are counted as not having IPPs at the time of this survey. This is justified by noting that often such projects do not come to fruition or are delayed for very long periods of time.

(e) *“Has the core state-owned utility been restructured/separated?”*

This step follows corporatization, and makes it easier to privatize separately those parts of the sector that are suitable for introducing competition through having many agents, and those parts of the sector (transmission in the power subsector, pipelines in the oil and gas subsector) that are natural monopolies. Such a structure aims to allow the regulatory body to limit the actions of the monopolistic segment, and to allow competition to work on the non-monopolistic segment. Only in the smallest sectors would it be regarded as sensible to consider privatizing intact a vertically integrated monopoly in order to avoid losing economies of scale.

(f) *“Has any of the existing state-owned enterprise been privatized [including outright sale, voucher privatization or joint ventures]?”*

This step lies at the core of reform. By introducing the profit motive and the possibility of competition, privatizing the existing assets of a state-owned company makes possible the largest gains from reform. Privatization alone is not sufficient to achieve these gains, however, because the structure of the privatized industry and the environment in which it operates are important for shaping its behavior. This question asks whether there is *some* privatization, not whether the sector has been completely privatized. To this extent it treats as equal those cases where the state has sold a minority of shares in a company to private shareholders, and cases where the whole of a generating plant or regional distribution network have been sold outright to a single owner. Hence the answer must be seen as measuring whether the country has proved itself willing to permit private ownership of previously state-owned assets, rather than measuring the extent of private ownership.

# 3

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## The Energy Subsectors

3.1 The questionnaire was applied to the following subsectors: power; upstream oil and gas; downstream gas; and downstream oil. These divisions correspond to major differences in the presence of these subsectors. All countries have power and downstream oil (at least the retailing and wholesaling of oil products) but the existence of an upstream oil and gas sector requires that the geology be appropriate. Accordingly many countries do not have (and cannot have) upstream oil and/or gas. Downstream gas sectors are always technically possible, but the high cost of transport makes this infeasible in many cases. The further away a country is from a producing source of gas, the less likely it will be to use gas as a fuel. Similar considerations apply to refining, where it may be cheaper to import refined oil products than to import the crude oil and refine it domestically; thus, some countries do not have a refining sector. Because gasoline is an essential product, all countries have a retail oil products sector.

3.2 In some countries a particular subsector has been in private ownership for a long period of time, so that the question of whether it has recently been reformed is irrelevant. Such countries are excluded from the questionnaire, by asking whether the subsector has been in private ownership for at least the last ten years. Hence, all countries included in the questionnaire both have the subsector present, and also started the 1990s with it in public ownership. This effectively makes 1990 the starting point for a "race" in which all participants began at a similar starting point, but since which date some have progressed and others have not. The survey gives an overall snapshot of the state of energy sector reform in these countries towards the end of the 1990s.

3.5 For each subsector the questions were phrased slightly differently if necessary. For the power subsector the questionnaire asked whether there are IPPs, whereas for the upstream oil and gas subsector it asks whether there are concessions to explore and produce. For the power subsector the question on privatization separated the subsector into generation and distribution assets, because of different issues involved in their privatization and operation as private companies. Electricity transmission was omitted because very few companies have privatized this, preferring to keep it as a state-owned natural monopoly. The separation between upstream (production) and downstream (supply) assets is already effected for oil and gas, and in both of these

subsectors the questionnaire omitted pipelines for reasons similar to those for electricity transmission.

3.6 The questionnaire divided the downstream oil subsector into two components: (i) refining and (ii) wholesale and retail. Because in neither case has there been a need to establish regulation or restructuring within the subsector, the questions focus on:

- a. Commercialization and corporatization,
- b. Privatization of existing state-owned assets, and
- c. For refining, private sector investment in greenfield sites.

3.7 For the retail sector, this third question was replaced by a question asking whether retail prices are freely set. This attempts to assess whether there is true retail competition, since in a market with several players there is no need to control retail prices.



# 4

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## Applying the Questionnaire

4.1 By the end of an intensive interview campaign and data search, complete answers had been obtained for 115 countries. Efforts were made to check all cases where respondents expressed some degree of uncertainty about the answers given.

4.2 For those countries that did respond, and that did have the relevant activity, the results were entered into a spreadsheet, with entries taking the value of “1” for “yes” and “0” for “no.” This allowed for substantial manipulation of the resulting data. The number of countries replying “yes” was obtained, and from this the proportion of those surveyed and answering “yes” was derived. This was carried out for each question, giving the “average” success rate for each of the questions. Summing these averages over the six questions asked for the subsector gives the “global reform indicator”—a score, whose maximum is six, and whose minimum is zero. This indicator is also expressed as a percentage of the maximum possible.

4.3 The sum of “yes” answers was also calculated country by country, to give each country specific reform indicators. These are not presented in the text but are reported in Appendixes A through E. From these country values the averages for different global regions, corresponding to the World Bank’s organizational groups, are calculated, and these are presented in the text.

4.4 The spreadsheet also allows conditional averages to be calculated. For example, the proportion of those countries which have some private sector participation, which also have a law and a regulatory body, indicates the extent to which countries embracing privatization have put in place the instruments necessary to make private sector companies work for the maximum benefit of the country.

4.5 A final set of calculations aggregates across energy subsectors. This must be done by summing the average reform score for each subsector, because the different subsectors are based on different numbers of countries where that activity was to be found in the public sector at the beginning of the 1990s.



# 5

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## Results and Analysis

5.1 Because few countries have activity in all four energy subsectors addressed by the questionnaire, coverage is rather different between subsectors. For this reason, the following results are given subsector by subsector.

### Power

5.2 For the power subsector—which is ubiquitous, and where there were no examples of long-term private ownership in the sample—complete answers were available from the 115 countries.

5.3 Table 5.1 gives the number of countries answering “yes” to each of the six key questions, as well as the overall reform indicator (the average number of “yes” answers per country). The question of privatization addresses generation and distribution separately.

**Table 5.1: Number of Countries Taking Key Reform Steps in the Power Subsector**

| <i>Corporate</i> | <i>Law</i> | <i>Regulator</i> | <i>IPPs</i> | <i>Restructure</i> | <i>Generation Privatization</i> | <i>Distribution Privatization</i> | <i>Reform Indicator</i> |
|------------------|------------|------------------|-------------|--------------------|---------------------------------|-----------------------------------|-------------------------|
| 51               | 38         | 33               | 46          | 40                 | 24                              | 21                                | 2.06                    |
| (44%)            | (33%)      | (29%)            | (40%)       | (35%)              | (21%)                           | (18%)                             | (34%)                   |

5.4 The table shows that, out of all countries surveyed, around 40 percent had in each case taken the key steps of corporatizing and commercializing, and of having IPPs under construction or in operation. About one-third in each case had established a regulatory body, passed a law, and restructured, whereas only 20 percent had seen some private sector ownership, either of the existing generation plant or of distribution.

5.5 The interpretation of the latter figures is of crucial importance since it is becoming evident that these steps are required in order to make a major improvement in the performance of the sector. The question asked whether there was *any* private sector participation, rather than the extent of private sector ownership. A score of 1 for an individual country can mean either that the whole sector has been privatized, or that it has just started on the road to privatization. Hence, even if globally all 115 countries had reported “yes” to these two questions, it would not imply that there was no further scope for private sector ownership in the sector.

5.6 Adding the scores on the key questions together to obtain the reform indicator for power (the rightmost column), counting a “yes” to either private sector ownership of existing generation or distribution as a single point (for a maximum possible score of 6), shows that globally, with a reform indicator score of 2.06 (34-percent of the maximum possible), only one-third of the steps seen as crucial for a thoroughgoing reform of the sector have been taken.

5.7 The same calculations are shown in Table 5.2 disaggregated by region. Because some of the regions have a very small number of countries involved, the percent figures for such regions are very sensitive to the presence or absence of one or two countries. For the three regions that span a substantial number of countries (Africa, Europe and Central Asia, and Latin America and the Caribbean) the percent figures can be taken as representative of regional differences.

**Table 5.2: Number of Countries Taking Key Reform Steps in the Power Subsector, by Region**

| <i>Key Step</i>            | <i>Region (number of countries)</i> |                |                |                |                |                |
|----------------------------|-------------------------------------|----------------|----------------|----------------|----------------|----------------|
|                            | <i>AFR (48)</i>                     | <i>EAP (9)</i> | <i>ECA(27)</i> | <i>LCC(18)</i> | <i>MNA (8)</i> | <i>SAR (5)</i> |
| Corporate                  | 15 (31%)                            | 4 (44%)        | 17 (63%)       | 11 (61%)       | 2 (25%)        | 2 (40%)        |
| Law                        | 7 (15%)                             | 3 (33%)        | 11 (41%)       | 14 (78%)       | 1 (13%)        | 2 (40%)        |
| Regulator                  | 4 (8%)                              | 1 (11%)        | 11 (41%)       | 15 (83%)       | 0 (0%)         | 2 (40%)        |
| IPPs                       | 9 (19%)                             | 7 (78%)        | 9 (33%)        | 15 (83%)       | 1 (13%)        | 5 (100%)       |
| Restructuring              | 4 (8%)                              | 4 (44%)        | 14 (52%)       | 13 (72%)       | 3 (38%)        | 2 (40%)        |
| Generation privatization   | 2 (4%)                              | 2 (22%)        | 10 (37%)       | 7 (39%)        | 1 (13%)        | 2 (40%)        |
| Distribution privatization | 2 (4%)                              | 1 (11%)        | 8 (30%)        | 8 (44%)        | 1 (13%)        | 1 (20%)        |
| Reform indicator           | 0.88<br>(15%)                       | 2.44<br>(41%)  | 2.70<br>(45%)  | 4.28<br>(71%)  | 1.00<br>(17%)  | 3.00<br>(50%)  |

Note: AFR = Africa; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LCC = Latin America and Caribbean; MNA = Middle East and North Africa; SAR = South Asia.

5.8 Table 5.2 shows clearly that reform in the power subsector is much more advanced in LCC than in other parts of the world. In LCC the reform indicator takes a value of 4.28, indicating that 71 percent of the key steps have been taken; the middle group of regions includes ECA, with 45 percent, EAP with 41 percent, and SAR with 50

percent. This picture is the reverse for Africa with just 15 percent, and MNA with 17 percent. Looking at the detailed indicators, it can be seen that even in LCC only 40 percent of countries have started to privatize existing generation or distribution, while in Africa the figure is an extremely low 4 percent.

5.9 The same data are presented in a different form in Table 5.3-a, which gives the frequency distribution of the number of key steps taken. It shows that 12 countries have completed all steps and another 10 have completed 5 steps. However, the very large number of countries that have taken no steps (42) or one step (15) again reinforces the picture that reform is very unevenly spread, and indeed that in many countries it has hardly begun (see Appendix E, Figure E-1).

5.10 Table 5.3-b presents this information as a cumulative distribution. For example, the table shows that the least-reforming 42 (37 percent) countries contribute none of the 237 total reform steps taken in the power subsector, and that the 57 (50 percent) countries that have taken one step or less contribute only 15 (6 percent) of all steps taken. The 19 percent most reforming countries contribute 51 percent of all steps, revealing a sizable disparity between countries in terms of the amount of reform steps taken: the Gini coefficient<sup>2</sup> for reform inequality is 55 percent, which is a very large value. This extreme inequality highlights the possibility that the large-scale efforts of a few countries may be diverting attention from the very large number of countries where little reform has been undertaken.

**Table 5.3-a: Number of Countries Taking Different, Numbers of Key Steps in the Power Subsector**

|                     | <i>Number of Steps Taken</i> |          |          |          |          |          |          |
|---------------------|------------------------------|----------|----------|----------|----------|----------|----------|
|                     | <i>0</i>                     | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
| Number of countries | 42                           | 15       | 16       | 12       | 8        | 10       | 12       |

**Table 5.3-b: Shares of Total Reform Steps in the Power Subsector by Shares of Least-Reforming Countries**

|                           | <i>Number of steps taken</i> |              |              |              |              |              |              |
|---------------------------|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                           | <i>0</i>                     | <i>0 - 1</i> | <i>0 - 2</i> | <i>0 - 3</i> | <i>0 - 4</i> | <i>0 - 5</i> | <i>0 - 6</i> |
| Percentage of countries   | 37                           | 50           | 63           | 74           | 81           | 90           | 100          |
| Percentage of total steps | 0                            | 6            | 20           | 35           | 49           | 70           | 100          |

<sup>2</sup> The Gini coefficient, defined mathematically in texts on economic statistics, measures the degree of inequality of some attribute as between observations. For example, with respect to wealth distribution, a Gini coefficient of zero percent would occur when all members of the population have equal wealth, while the maximum value of 100 percent would occur when one member owned all the assets and all others owned nothing.

5.11 The steps of reform might be viewed as having an optimal sequence. For example, if a utility has not been corporatized, it makes little sense to pass a law permitting privatization; if there is no regulator, the introduction of IPPs and the sale of existing assets is likely to prove sub-optimal. An optimal sequence of steps might be as follows:

- a. Corporatization
- b. Restructure
- c. Law
- d. Regulator
- e. IPPs
- f. Privatize generation or distribution

5.12 In this scenario, a country that has taken all these steps scores 6, a country with the first five scores 5, and so on. Countries that take steps out of sequence score only for as many as are in sequence starting from the first step. Table 3-C indicates the number of countries taking different numbers of reform steps in sequence. As the table shows, many countries that are taking reform steps are taking them out of sequence, which is likely to lead to less effective reform. The Gini coefficient of inequality of reform steps taken in sequence is extraordinarily high at 72 percent. The contrast between the group of twelve countries that have taken all steps in sequence, and the group of 90 countries that have taken only the first two steps in sequence, is striking.

**Table 5.3-c: Number of Countries Taking Different Numbers of Key Steps in Sequence in the Power Subsector**

|                     | <i>Number of Steps Taken in Sequence</i> |          |          |          |          |          |          |
|---------------------|--|----------|----------|----------|----------|----------|----------|
|                     | <i>0</i>                                 | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
| Number of Countries | 63                                       | 18       | 9        | 5        | 5        | 2        | 12       |

5.13 One strategy advocated in the early days of the energy reform movement was to encourage the entry of IPPs. This was seen as less problematical for governments because it involves neither the sale of existing national assets to foreigners nor the immediate redundancies that a private sector owner might require. It was hoped that IPPs would indirectly (1) set an example to the rest of the energy sector and (2) eventually force the sector both to become more efficient and to be willing to embrace privatization of existing assets. If this were to happen, the sector would ideally need a law and a regulator—even though IPPs, when governed by long-term take-or-pay contracts, require neither for successful operation. As a test of the relationship between these stages of reform, Table 5.4 shows, only for those 43 countries with IPPs, the number that have taken various other steps.

**Table 5.4: Number of Countries with IPPs that Have Taken Other Key Steps**

| <i>Those with IPPs that have a law</i> | <i>Those with IPPs that have a law and a regulator</i> | <i>Those with IPPs that have privatization of generation or distribution</i> |
|--|--|--|
| 26 (60%)                               | 19 (44%)   | 23 (53%)   |

5.14 As Table 5.4 indicates, only 60 percent of those countries that have IPPs have passed a law, while only 44 percent have both a law and a regulator in place. Further, only 53 percent of those with IPPs have allowed any privatization of existing assets, so that the “Trojan horse” strategy of encouraging IPPs as a route to more extensive reform has had, at present, only a modest success at best. The lack of a consistent approach to reform is also emphasized by a calculation showing that, of those countries that have privatized some existing assets of either generation or distribution, only 60 percent have both a law and a regulator. In countries without these two latter features there is certainly scope for inefficient behavior of the private sector owners, and so the reform process can be seen to be incomplete in rather crucial ways—even for a number of countries that have taken some of the most important steps.

### Upstream Oil and Gas

5.15 In the sample of countries surveyed, answers were obtained for 49 countries that have upstream oil or gas production. Excluded were (1) seven countries whose upstream sectors had been completely privately owned for more than 10 years and (2) another 59 countries lacking upstream oil or gas. Table 5.5 presents the global results for the six key variables, in addition to the reform indicator.

**Table 5.5: Number of Countries Taking Key Reform Steps in Upstream Oil/Gas**

| <i>Corporate</i> | <i>Law</i> | <i>Regulator</i> | <i>Restructure</i> | <i>Private Concessions</i> | <i>Privatization</i> | <i>Reform Indicator</i> |
|------------------|------------|------------------|--------------------|----------------------------|----------------------|-------------------------|
| 33 (67%)         | 34 (69%)   | 15 (31%)         | 21 (43%)           | 34 (69%)                   | 7 (14%)              | 2.94 (49%)              |

5.16 The picture for the upstream oil and gas subsector differs somewhat from that of the power subsector. Overall, the average number of steps taken is substantially higher (49 percent versus 34 percent) and the variation between responses to different steps is substantially wider. The level of response for passing a law is high at 69 percent (versus 33 percent for power) while the lowest level of response is for the privatization of existing assets at 14 percent (versus 21 percent for power generation and 18 percent for power distribution). The proportion of countries allowing private bidding for concessions (69 percent) is similar to the proportion that have passed a law (69 percent) but rather

higher than in the power subsector for those allowing IPPs (40 percent). It appears that there is more willingness than in the power subsector to move towards a system in which new investment can be undertaken by the private sector, but substantially less willingness to privatize the existing upstream oil/gas state utility. It must also be remembered that 14 percent of countries with upstream oil or gas have had private sector ownership for more than 10 years.

5.17 Table 5.6, which gives the same information for the regional groupings, again has the same three regions with sufficient countries involved to make regional averages meaningful. As it reveals, the regional picture for upstream oil and gas is very different from that of power. In all regions the overall indicator is around 50 percent, and in Africa it is nearly 60 percent. In those African countries where there is production, there has been a very high propensity to allow private concessions, which is also associated with the need for the state oil company to be corporatized and commercialized. In LCC there is a substantial willingness to allow private sector participation in concessions for upstream oil and gas (less than for IPPs) and some countries have been prepared to privatize existing assets, which is the case for only one African country.

**Table 5.6: Number of Countries Taking Key Reform Steps in the Upstream Oil and Gas Subsector, by Region**

| <i>Key Step</i>     | <i>Region (number of countries)</i> |                |                 |                |                |                |
|---------------------|-------------------------------------|----------------|-----------------|----------------|----------------|----------------|
|                     | <i>AFR (11)</i>                     | <i>EAP (5)</i> | <i>ECA (17)</i> | <i>LCC (8)</i> | <i>MNA (5)</i> | <i>SAR (3)</i> |
| Corporate           | 8 (73%)                             | 4 (80%)        | 11 (65%)        | 5 (63%)        | 4 (80%)        | 1 (33%)        |
| Law                 | 10 (91%)                            | 3 (60%)        | 11 (65%)        | 5 (63%)        | 3 (60%)        | 2 (67%)        |
| Regulator           | 4 (36%)                             | 2 (40%)        | 4 (24%)         | 4 (50%)        | 0 (0%)         | 1 (33%)        |
| Restructure         | 6 (55%)                             | 3 (60%)        | 5 (29%)         | 2 (25%)        | 2 (40%)        | 3 (100%)       |
| Private concessions | 10 (91%)                            | 2 (40%)        | 11 (65%)        | 5 (63%)        | 4 (80%)        | 2 (67%)        |
| Privatization       | 1 (9%)                              | 0 (0%)         | 3 (18%)         | 3 (38%)        | 0 (0%)         | 0 (0%)         |
| Reform indicator    | 3.55<br>(59%)                       | 2.80<br>(47%)  | 2.65<br>(44%)   | 3.00<br>(50%)  | 2.60<br>(43%)  | 3.00<br>(50%)  |

5.18 Table 5.7-a shows the distribution of the number of reform steps taken, and again demonstrates that very few countries have taken 5 or 6 steps (see Appendix E, Figure E-2). Complete reform is much less common than in the power subsector, where nearly 15 percent of the countries have taken all the key steps.

**Table 5.7-a: Number of Countries Taking Different Numbers of Key Steps in the Upstream Oil and Gas Subsector**

|                     | <i>Number of steps taken</i> |          |          |          |          |          |          |
|---------------------|------------------------------|----------|----------|----------|----------|----------|----------|
|                     | <i>0</i>                     | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
| Number of countries | 5                            | 4        | 7        | 15       | 12       | 3        | 3        |



5.19 Table 5.7-b shows that the distribution of reform effort for upstream oil and gas is still very unequal, albeit less so than in the power subsector: the Gini coefficient is 29 percent compared to 55 percent for power. The 37 percent most reformist countries contribute 56 percent of all steps in upstream oil and gas, but 80 percent of all steps in power.

**Table 5.7-b: Shares of Total Reform Steps in Upstream Oil and Gas by Shares of Least-Reforming Countries**

|                           | <i>Number of steps taken</i> |              |              |              |              |              |              |
|---------------------------|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                           | <i>0</i>                     | <i>0 - 1</i> | <i>0 - 2</i> | <i>0 - 3</i> | <i>0 - 4</i> | <i>0 - 5</i> | <i>0 - 6</i> |
| Percentage of countries   | 10                           | 18           | 33           | 63           | 88           | 94           | 100          |
| Percentage of total steps | 0                            | 3            | 13           | 44           | 77           | 88           | 100          |

5.20 Of the 35 countries that have experienced some private sector activity—either with concessions or with privatization of existing assets—only 13 have passed a law and established a regulatory framework, confirming that a large number of countries have not yet completed the reform process.

### Downstream Gas

5.21 Out of the 115 countries for which information is available, 55 have a downstream gas subsector that has experienced some public sector ownership during the last 10 years, while in 10 more countries there has been private sector ownership for at least the last 10 years. Table 5.8, which excludes the latter 10 in addition to the 50 countries lacking a downstream gas industry, presents the number of countries taking key reform steps in this subsector.

**Table 5.8: Number of Countries Taking Key Reform Steps in the Downstream Gas Subsector**

| <i>Corporate</i> | <i>Law</i> | <i>Regulator</i> | <i>Restructure</i> | <i>Private investment</i> | <i>Privatization</i> | <i>Reform indicator</i> |
|------------------|------------|------------------|--------------------|---------------------------|----------------------|-------------------------|
| 33 (60%)         | 22 (40%)   | 22 (40%)         | 19 (35%)           | 15 (27%)                  | 15 (27%)             | 2.29 (38%)              |

5.22 As Table 5.8 shows, the global picture of reform for downstream gas is fairly similar to that for power. Apart from the step of commercializing and corporatizing, for every other step fewer than half the countries have been involved, and only 27 percent of countries have allowed private sector investment (as opposed to 40 percent for IPPs and 69 percent for upstream concessions). The level of privatization of existing assets is similar to that for power, but substantially greater than for upstream oil and gas.

5.23 Table 9, which gives the picture disaggregated by region, shows a very different picture from upstream oil/gas. The largest difference from the upstream oil/gas picture is that LCC now has the highest score, whereas Africa has a very low score. In MNA virtually no reform steps have been taken. There is much greater variation between regions than exists in the upstream oil and gas subsector.

5.24 The analysis of the distribution of the number of steps, given in Table 10-A, shows that only two countries have completed all the steps in this subsector, and that a very high proportion of the countries have completed no steps or just one step (see Appendix E, Figure E-3).

**Table 5.9: Number of Countries Taking Key Reform Steps in the Downstream Gas Subsector, by Region**

| <i>Key step</i>    | <i>Region (number of countries)</i> |                |                |               |                |                |
|--------------------|-------------------------------------|----------------|----------------|---------------|----------------|----------------|
|                    | <i>AFR (6)</i>                      | <i>EAP (4)</i> | <i>ECA(27)</i> | <i>LCC(9)</i> | <i>MNA (6)</i> | <i>SAR (3)</i> |
| Corporate          | 2 (33%)                             | 4 (100%)       | 16 (59%)       | 5 (56%)       | 3 (50%)        | 3 (100%)       |
| Law                | 2 (33%)                             | 2 (50%)        | 9 (33%)        | 7 (78%)       | 0 (0%)         | 2 (67%)        |
| Regulator          | 2 (33%)                             | 1 (25%)        | 11 (41%)       | 7 (78%)       | 0 (0%)         | 1 (33%)        |
| Restructuring      | 2 (33%)                             | 1 (25%)        | 8 (30%)        | 5 (56%)       | 1 (17%)        | 2 (67%)        |
| Private Investment | 2 (33%)                             | 1 (25%)        | 6 (22%)        | 5 (56%)       | 0 (0%)         | 1 (33%)        |
| Privatization      | 1 (17%)                             | 0 (0%)         | 9 (33%)        | 5 (56%)       | 0 (0%)         | 0 (0%)         |
| Reform indicator   | 1.83<br>(31%)                       | 2.25<br>(38%)  | 2.19<br>(36%)  | 3.78<br>(63%) | 0.67<br>(11%)  | 3.00<br>(50%)  |

**Table 5.10-a: Number of Countries Taking Different Numbers of Key Steps in the Downstream Gas Subsector**

|                     | <i>Number of steps taken</i> |          |          |          |          |          |          |
|---------------------|------------------------------|----------|----------|----------|----------|----------|----------|
|                     | <i>0</i>                     | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
| Number of countries | 12                           | 12       | 8        | 6        | 7        | 8        | 2        |

5.25 Table 5.10-b indicates the substantial inequality of reform between countries: the 18 percent of most reformist countries account for 41 percent of all steps taken. The downstream gas sector, with a Gini coefficient of 44 percent, is notably less unequal with respect to the extent of reform than the power sector, but is more unequal than the upstream oil and gas subsector.

**Table 5.10-b: Shares of Total Reform Steps in the Downstream Gas Subsector, by Shares of Least-Reforming Countries**

|                           | <i>Number of steps taken</i> |              |              |              |              |              |              |
|---------------------------|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                           | <i>0</i>                     | <i>0 - 1</i> | <i>0 - 2</i> | <i>0 - 3</i> | <i>0 - 4</i> | <i>0 - 5</i> | <i>0 - 6</i> |
| Percentage of countries   | 22                           | 44           | 58           | 69           | 82           | 96           | 100          |
| Percentage of total steps | 0                            | 10           | 22           | 37           | 59           | 90           | 100          |

5.26 Finally, a calculation shows that of those 21 countries that have either private sector concessions or have privatized existing assets, only 10 have a law and a regulator. This suggests that in a substantial number of countries the reform approach has not yet been fully integrated.

### Downstream Oil

5.27 The downstream oil subsector is further divided into (a) refining and (b) wholesale and retail subsectors because of their different ownership patterns and potential for competition. Of the 115 countries surveyed, 44 had no domestic refining capacity and 14 have been in private ownership for more than ten years, leaving 57 countries for which the refining key questions could be answered. For the wholesale and retail subsector, 43 had had the sector in private ownership for more than 10 years, leaving 72 countries for which the wholesale/retail questions could be answered. Separate reform indicator variables have been constructed for the two subsectors because of the different coverage involved; in each case the maximum score is three.

**Table 5.11: Number of Countries Taking Key Reform Steps in the Downstream Oil Refining Subsector**

| <i>Corporatization of refinery</i> | <i>Private investment in refining</i> | <i>Privatization of refinery</i> | <i>Reform indicator</i> |
|------------------------------------|---------------------------------------|----------------------------------|-------------------------|
| 31 (54%)                           | 13 (23%)                              | 16 (28%)                         | 1.05 (35%)              |

5.28 The overall level of reform is low for downstream oil refining and is rather similar to that of downstream gas. There is a much lower level of private sector new investment in the sector than for power or for upstream oil and gas, but the level of privatization of existing assets is rather higher than for upstream oil and gas and for power.

5.29 Table 5.12 shows that in the Africa, MNA, and LCC regions there is a distinct unwillingness to allow private participation in refining—unlike in ECA and EAP, where about half of the countries have seen privatization. In every region there appears to have been a high level of willingness to corporatize and commercialize the state-owned refinery.

**Table 5.12: Number of Countries by Region Taking Key Reform Steps in the Downstream Oil Refining Subsector**

| <i>Key step</i>                | <i>Region (number of countries)</i> |                |                |                |                |                |
|--------------------------------|-------------------------------------|----------------|----------------|----------------|----------------|----------------|
|                                | <i>AFR (11)</i>                     | <i>EAP (4)</i> | <i>ECA(22)</i> | <i>LCC(11)</i> | <i>MNA (6)</i> | <i>SAR (3)</i> |
| Corporate Refinery             | 6 (55%)                             | 3 (75%)        | 13 (59%)       | 5 (45%)        | 2 (33%)        | 2 (67%)        |
| Private Investment in refining | 2 (18%)                             | 2 (50%)        | 7 (32%)        | 1 (9%)         | 0 (0%)         | 1 (33%)        |
| Privatization of refinery      | 0 (0%)                              | 2 (50%)        | 10 (45%)       | 2 (18%)        | 1 (17%)        | 1 (33%)        |
| Reform indicator               | 0.73<br>(24%)                       | 1.75<br>(58%)  | 1.36<br>(45%)  | 0.73<br>(24%)  | 0.50<br>(17%)  | 1.33<br>(44%)  |

5.30 The frequency distribution of the number of steps taken, as given in Table 5.13-a, shows that few countries have taken a large number of steps, while the overwhelming majority have taken no or just one step (see Appendix E, Figure E-4a).

**Table 5.13-a. The Number of Countries Taking Different Numbers of Key Steps in the Downstream Oil Refining Subsector**

|                     | <i>Number of steps taken</i> |          |          |          |
|---------------------|------------------------------|----------|----------|----------|
|                     | <i>0</i>                     | <i>1</i> | <i>2</i> | <i>3</i> |
| Number of countries | 24                           | 14       | 11       | 8        |

5.31 Table 5.13-b shows that the 33 percent most reforming countries carried out 77 percent of the reform steps for refining—a very high degree of inequality, and similar to that for power (there are too few steps to construct a useful Gini coefficient).

**Table 5.13-b: Shares of Total Reform Steps Taken in Refining by Least-Reforming Countries**

|                           | <i>Number of steps taken</i> |              |              |              |
|---------------------------|------------------------------|--------------|--------------|--------------|
|                           | <i>0</i>                     | <i>0 - 1</i> | <i>0 - 2</i> | <i>0 - 3</i> |
| Percentage of countries   | 42                           | 67           | 86           | 100          |
| Percentage of total steps | 0                            | 23           | 60           | 100          |

5.32 The wholesale and retail oil subsector differs greatly from other energy sectors in that 37 percent of countries have experienced private ownership for at least ten years. In many countries this subsector has not been seen as a natural monopoly needing to be run by the state or as a strategic sector whose operation cannot be left in private

hands. Table 5.14 gives the global values for the three key questions and for the reform indicator based on their sum.

**Table 5.14: Number of Countries Taking Key Reform Steps in the Downstream Oil Wholesale and Retail Subsector**

| <i>Corporate<br/>wholesale/retail</i> | <i>Privatization of<br/>wholesale/retail</i> | <i>Free retail prices</i> | <i>Reform indicator</i> |
|---------------------------------------|--|---------------------------|-------------------------|
| 31 (43%)                              | 20 (28%)                                     | 18 (25%)                  | 0.96 (32%)              |

5.33 Where the sector has been under state ownership and control, there has been little movement towards privatization, and the state has continued to control retail prices in the great majority of countries. As indicated in Table 5.15, the ECA region shows the highest propensity to move towards private sector participation, with LCC again having a notably low figure.

**Table 5.15: Number of Countries Taking Key Reform Steps in the Downstream Oil Wholesale and Retail Subsector, by Region**

| <i>Key Step</i>                      | <i>Region (number of countries)</i> |                |                |                |                |                |
|--------------------------------------|-------------------------------------|----------------|----------------|----------------|----------------|----------------|
|                                      | <i>AFR (17)</i>                     | <i>EAP (8)</i> | <i>ECA(26)</i> | <i>LCC(11)</i> | <i>MNA (5)</i> | <i>SAR (5)</i> |
| Corporate<br>wholesale/retail        | 5 (29%)                             | 4 (50%)        | 13 (50%)       | 4 (36%)        | 2 (40%)        | 3 (60%)        |
| Privatization of<br>wholesale/retail | 4 (24%)                             | 0 (0%)         | 11 (42%)       | 2 (18%)        | 2 (40%)        | 1 (20%)        |
| Free prices                          | 1 (6%)                              | 1 (13%)        | 11 (42%)       | 5 (45%)        | 0 (0%)         | 0 (0%)         |
| Reform indicator                     | 0.59<br>(20%)                       | 0.63<br>(21%)  | 1.35<br>(45%)  | 1.00<br>(33%)  | 0.80<br>(27%)  | 0.80<br>(27%)  |

5.34 Table 5.16-a confirms that in the wholesale/retail oil subsector very few countries have moved completely to liberalize the formerly state-owned sector, and many indeed have taken no reform steps yet (see Appendix E, Figure E-4b). Table 5.16-b again shows considerable inequality between countries in the number of reform steps taken.

**Table 5.16-a: Number of Countries Taking Different Numbers of Key Steps in the Downstream Oil Wholesale and Retail Subsector**

|                     | <i>Number of steps taken</i> |          |          |          |
|---------------------|------------------------------|----------|----------|----------|
|                     | <i>0</i>                     | <i>1</i> | <i>2</i> | <i>3</i> |
| Number of countries | 32                           | 21       | 9        | 10       |

**Table 5.16-b: Shares of Total Reform Steps Taken by Least-Reforming Countries in the Downstream Oil Refining Subsector**

|                           | <i>Number of steps taken</i> |              |              |              |
|---------------------------|------------------------------|--------------|--------------|--------------|
|                           | <i>0</i>                     | <i>0 - 1</i> | <i>0 - 2</i> | <i>0 - 3</i> |
| Percentage of countries   | 44                           | 74           | 88           | 100          |
| Percentage of total steps | 0                            | 30           | 56           | 100          |

### Overall Energy Sector

5.35 Although each of the four energy subsectors has responses from different numbers of countries, an aggregate picture can be obtained by pooling the average reform indicator scores globally and by region. Adding these average values together yields a variable whose maximum is 24. Table 5.17 gathers the results from the individual regions and subsectors, as well as the global figure, and then aggregates these to obtain the “overall” energy reform indicator, expressed as a percentage of the maximum possible. Country-by-country information for all energy sector reform indicators is shown in Appendix B.

**Table 5.17: Overall Reform Indicators, by Region and Globally**

| <i>Region</i> | <i>Subsector</i> |                             |                       |                       |                             |       | <i>Overall reform indicator</i> | <i>Percentage of maximum</i> |
|---------------|------------------|-----------------------------|-----------------------|-----------------------|-----------------------------|-------|---------------------------------|------------------------------|
|               | <i>Power</i>     | <i>Upstream oil and gas</i> | <i>Downstream gas</i> | <i>Downstream Oil</i> |                             |       |                                 |                              |
|               |                  |                             |                       | <i>Refining</i>       | <i>Wholesale and retail</i> |       |                                 |                              |
| Global        | 2.06             | 2.94                        | 2.29                  | 1.05                  | 0.96                        | 9.30  | 39                              |                              |
| Africa        | 0.88             | 3.55                        | 1.83                  | 0.73                  | 0.59                        | 7.58  | 32                              |                              |
| EAP           | 2.44             | 2.80                        | 2.25                  | 1.75                  | 0.63                        | 9.87  | 41                              |                              |
| ECA           | 2.70             | 2.65                        | 2.19                  | 1.36                  | 1.35                        | 10.25 | 43                              |                              |
| LCC           | 4.28             | 3.00                        | 3.78                  | 0.73                  | 1.00                        | 12.79 | 53                              |                              |
| MNA           | 1.00             | 2.60                        | 0.67                  | 0.50                  | 0.80                        | 5.57  | 23                              |                              |
| SAR           | 3.00             | 3.00                        | 3.00                  | 1.33                  | 0.80                        | 11.13 | 46                              |                              |

5.36 The overall reform indicator for all countries and all sectors is 39 percent, indicating that, globally, well under one-half the key steps for energy sector reform have yet been taken. Table 5.17 also confirms that, considering all the reform steps in all sectors, there is great variation between regions. The best that has been achieved is 53 percent of the maximum in LCC, while in ECA and SAR the overall indicators are 43 percent and 46 percent, respectively. At the other extreme, the MNA countries have taken only one-quarter of the total number of key steps, while the large group of African countries have taken about one-third of the key steps.

5.37 Table 5.18 concentrates on the steps that directly involve the participation of the private sector, either in new investment or in the privatization of the existing assets. Taking a weighted average rate across subsectors yields the average propensity to allow (1) private sector investment in new sites and (2) private sector involvement in the ownership of existing assets. The country-by-country picture for the entry of private sector investment into greenfield sites is given in Appendix C, and that for the privatization of existing assets in Appendix D.

5.38 Table 5.18 acts as the highest-level summary of the extent to which private enterprise has entered the energy sector in developing countries. It shows that only 24 percent of countries have yet allowed any form of privatization of existing assets in the energy sector, and only 40 percent have permitted the private sector to be involved with new investment. There are very great regional differences and, even in the regions with the greatest reform experience, not more than 36 percent have allowed privatization of existing assets, while in Africa, EAP, MNA, and SAR this figure is around 15 percent. Combining these two indicators of private sector participation shows that MNA has involved the private sector to the least extent, while Africa is also very low, with the notable exception of concessions for upstream oil and gas.

**Table 5.18: Proportions of Countries Experiencing Private Sector Investment and Privatization in Energy, by Subsector and Overall (Percent)**

| <i>Subsector</i>                       | <i>Region</i> |            |            |            |            |            |            |
|--|---------------|------------|------------|------------|------------|------------|------------|
|  | <i>Global</i> | <i>AFR</i> | <i>EAP</i> | <i>ECA</i> | <i>LCC</i> | <i>MNA</i> | <i>SAR</i> |
| Power                                  |               |            |            |            |            |            |            |
| IPPs                                   | 40            | 19         | 78         | 33         | 83         | 13         | 100        |
| Privatization                          | 25            | 6          | 33         | 41         | 50         | 13         | 40         |
| Upstream oil/ and gas                  |               |            |            |            |            |            |            |
| Concessions                            | 69            | 91         | 40         | 65         | 63         | 80         | 67         |
| Privatization                          | 14            | 9          | 0          | 18         | 38         | 0          | 0          |
| Downstream gas                         |               |            |            |            |            |            |            |
| Private investment                     | 27            | 33         | 25         | 22         | 56         | 0          | 33         |
| Privatization                          | 27            | 17         | 0          | 33         | 56         | 0          | 0          |
| Downstream oil                         |               |            |            |            |            |            |            |
| Private refinery investment            | 23            | 18         | 50         | 32         | 9          | 0          | 33         |
| Privatization refinery                 | 28            | 0          | 50         | 45         | 18         | 17         | 33         |
| Privatization wholesale                | 28            | 24         | 0          | 42         | 18         | 40         | 20         |
| Overall energy % of maximum (weighted) |               |            |            |            |            |            |            |
| New private investment                 | 40            | 40         | 48         | 38         | 53         | 23         | 58         |
| Privatization                          | 24            | 11         | 17         | 36         | 36         | 14         | 19         |





# 6

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## Assessment

6.1 This energy sector “scorecard” gives a full picture of the degree to which a wide range of developing countries have embarked on energy sector reform. It gives a definitive picture of this aspect of sector reform as at the middle of 1998.

### Global Conclusions

6.2 The global reform indicator shows that only 39 percent of the steps identified as necessary for a fully effective reform have been taken in the energy sector as a whole. Importantly, the reform movement has been most successful in the upstream oil and gas subsector, where 49 percent of the steps have been taken. The other subsectors yield rather lower figures, notably the power sector, which has attracted the most discussion among observers. In this sector only 34 percent of the steps have been taken.

6.3 Globally speaking, then, a great deal remains to be done. Even under the assumption that each step is equally important and equally difficult to complete, only one-third of the necessary movement has been taken. However, because the steps are not of equal difficulty or importance, and the gains from reform will also depend on the extent to which the private sector is involved (not simply its mere existence in a sector), these figures certainly understate the amount of progress required.

6.4 Detailed examination of the pattern of steps taken reveals a further important finding at a global level. Not all steps are equally likely to have been taken: in particular, the percentage of countries that have allowed privatization of some of the existing assets of the energy sectors is only 24 percent. In three-quarters of the countries surveyed no assets have been privatized, and in upstream oil and gas this figure is as high as 86 percent. Because the ultimate gains from the reform movement come from the entry of the private sector and competition into markets, the fact that such a large number of countries have not even started to give themselves the chance to benefit from the benefits of competition, reinforces the remarks above about the magnitude of what still remains to be achieved.

### **The Most Common Step: Corporatization and Commercialization**

6.5 The step that has been taken most commonly is the corporatization and commercialization of state-owned enterprises—this ranges from 44 percent in the power subsector to 67 percent in the upstream oil and gas subsector. This is certainly a very necessary step before any improvement in the performance of the sector can be obtained, since it facilitates both the entry of private sector investment in new projects and the privatization of existing assets. However, it is almost certainly the easiest step to take, requiring the least effort and commitment by the government.

### **Private Investment in Greenfield Sites**

6.6 The number of countries that have allowed the private sector to invest in greenfield sites is encouragingly high: 40 percent for the overall energy sector, with power at 40 percent and upstream oil and gas at 69 percent. (The high latter figure reflects the high costs and risky returns associated with exploration and development, which many small countries cannot afford to undertake.) This is coupled with a very low proportion being willing to privatize existing assets—once the investment has been taken, governments have been most unwilling to sell off this source of rent to the private sector. The natural resource has been treated rather differently from the rest of the energy sector.

6.7 The scorecard further reveals that the entry of the private sector to greenfield site investment has not automatically brought with it other reform steps. Only half of the countries that had IPPs in power or private sector greenfield investment in the downstream gas subsector had also passed an law permitting privatization or established a regulatory body; and in the upstream oil and gas subsector only one-third of countries possessing concessions to explore and produce also had a law or a regulatory body. This suggests that the “Trojan Horse” strategy of encouraging private greenfield investment as a means to open the energy sector to other reforms, and eventually to the privatization of the existing state enterprise, has not been widely successful. In effect, many countries have seen the additional investment brought by such activity as a sufficient gain, and have done only the minimum required to make it possible (usually just corporatization and commercialization of the state enterprise).

### **Individual Countries**

6.8 The survey reveals large differences in the amount of reform undertaken from country to country. This is of considerable importance because it suggests that the factors predisposing or repelling a country from embarking on reform are country-specific; otherwise, all countries would tend to be at a fairly similar stage. The severe degree of inequality between countries in the power and downstream gas subsectors confirms that a few countries have taken reform very seriously while the majority have done little. This also points to a need to intensify efforts to persuade countries of the potential benefits to be reaped.

## Regions

6.9 The regional groupings confirm the country findings: some regions have almost uniformly adopted similar degrees of reform, notably the Latin America and Europe and Central Asia regions. The latter is understandable in that the timing of the large political changes associated with the breakup of the former Soviet Union coincided with the beginning of the reform movement: such countries needed to make changes, and there was a large amount of advice and help from banks and development agencies to encourage the countries to move to private sector involvement in energy. The case of Latin America, where many steps have been taken in the power subsector and a substantial number in the downstream gas subsector, suggests an important role for the demonstration effect of neighbors who have successfully reformed. The lessons from a nearby neighbor may be more convincing than those from a distant and highly industrialized country that may also be held out as an example.

## Reasons for Understatement of Work to Be Done

6.10 The data presented in this survey understate what actually remains to be done to achieve extensive private sector operation of the energy sector. This is for the following reasons:

- The survey asked whether there was any private sector participation, so that even a small asset or share sale would be counted as “yes” and given equal weight to complete divestiture. All those countries with partial privatization still have more to be accomplished.
- All countries are treated as equally important in the questionnaire, so that countries with equal degrees of privatization receive the same weight irrespective of the size of their respective energy sectors.
- With certain countries organized as a series of independent states, a success in one region (e.g., in one state of India) counts as a success for the whole country, whereas in reality the other states may be very far from reform.

## Conclusion

6.11 By creating a scorecard of simple indicators, this investigation has been able to quantify the extent of energy sector reform in a large number of developing countries. The picture that emerges is one of reform concentrated in only a few countries—although even in these countries the process may be incomplete or not very effective. Much more can be achieved globally, and detailed investigations into the degree of energy sector reform and its impacts should allow further insight into the potential for continuing reform efforts to improve economic welfare worldwide.



# Appendix A

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## Reform Indicators

**A-1. Reform Indicator for Power**

**A-2. Reform Indicator for Upstream Oil and Gas**

**A-3. Reform Indicator for Downstream Gas**

**A-4a. Reform Indicator for Downstream Oil: Refining**

**A-4b. Reform Indicator for Downstream Oil: Wholesale and Retail**









| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Law</i> | <i>Regulator</i> | <i>IPPs</i> | <i>Restructured</i> | <i>Generation<br/>Private</i> | <i>Distribution<br/>Private</i> | <i>Reform<br/>Indicator</i> |
|----------------|--|------------|------------------|-------------|---------------------|-------------------------------|---------------------------------|-----------------------------|
| Latvia         | 0                                      | 1          | 1                | 1           | 0                   | 1                             | 0                               | 4                           |
| Lithuania      | 1                                      | 0          | 1                | 0           | 0                   | 0                             | 0                               | 2                           |
| Macedonia      | 1                                      | 1          | 0                | 0           | 0                   | 0                             | 0                               | 2                           |
| Moldova        | 1                                      | 0          | 1                | 0           | 1                   | 0                             | 0                               | 3                           |
| Poland         | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 1                               | 6                           |
| Romania        | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Russia         | 1                                      | 0          | 1                | 0           | 1                   | 1                             | 1                               | 4                           |
| Slovakia       | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Slovenia       | 1                                      | 0          | 0                | 0           | 1                   | 0                             | 0                               | 2                           |
| Tajikistan     | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Turkey         | 1                                      | 1          | 0                | 1           | 1                   | 1                             | 1                               | 5                           |
| Turkmenistan   | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Ukraine        | 1                                      | 1          | 1                | 0           | 1                   | 1                             | 1                               | 5                           |
| Uzbekistan     | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Argentina      | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 1                               | 6                           |
| Bolivia        | 1                                      | 1          | 1                | 0           | 1                   | 1                             | 1                               | 5                           |
| Brazil         | 1                                      | 0          | 1                | 1           | 1                   | 0                             | 1                               | 5                           |
| Chile          | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 1                               | 6                           |
| Colombia       | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 1                               | 6                           |
| Costa Rica     | 1                                      | 0          | 1                | 1           | 1                   | 0                             | 0                               | 4                           |
| Dominican R.   | 0                                      | 0          | 1                | 1           | 1                   | 0                             | 0                               | 3                           |
| Ecuador        | 0                                      | 1          | 1                | 1           | 1                   | 0                             | 0                               | 4                           |
| El Salvador    | 1                                      | 1          | 1                | 1           | 1                   | 0                             | 1                               | 6                           |
| Guatemala      | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 0                               | 6                           |
| Honduras       | 0                                      | 1          | 0                | 1           | 0                   | 0                             | 0                               | 2                           |
| Jamaica        | 1                                      | 1          | 1                | 1           | 1                   | 0                             | 0                               | 5                           |
| Mexico         | 0                                      | 1          | 1                | 1           | 0                   | 0                             | 0                               | 3                           |
| Nicaragua      | 0                                      | 1          | 1                | 1           | 0                   | 0                             | 0                               | 3                           |
| Panama         | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 1                               | 6                           |
| Paraguay       | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Peru           | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 1                               | 6                           |
| Uruguay        | 0                                      | 1          | 0                | 0           | 0                   | 0                             | 0                               | 1                           |
| Algeria        | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Egypt          | 0                                      | 0          | 0                | 0           | 1                   | 0                             | 0                               | 1                           |
| Iran           | 0                                      | 0          | 0                | 0           | 1                   | 0                             | 0                               | 1                           |
| Jordan         | 1                                      | 1          | 0                | 0           | 1                   | 0                             | 0                               | 3                           |

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Law</i> | <i>Regulator</i> | <i>IPPs</i> | <i>Restructured</i> | <i>Generation<br/>Private</i> | <i>Distribution<br/>Private</i> | <i>Reform<br/>Indicator</i> |
|----------------|--|------------|------------------|-------------|---------------------|-------------------------------|---------------------------------|-----------------------------|
| Lebanon        | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Morocco        | 1                                      | 0          | 0                | 1           | 0                   | 1                             | 1                               | 3                           |
| Tunisia        | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Yemen          | 0                                      | 0          | 0                | 0           | 0                   | 0                             | 0                               | 0                           |
| Bangladesh     | 0                                      | 0          | 0                | 1           | 0                   | 0                             | 0                               | 1                           |
| India          | 1                                      | 1          | 1                | 1           | 1                   | 1                             | 1                               | 6                           |
| Nepal          | 1                                      | 0          | 0                | 1           | 0                   | 0                             | 0                               | 2                           |
| Pakistan       | 0                                      | 1          | 1                | 1           | 1                   | 1                             | 0                               | 5                           |
| Sri Lanka      | 0                                      | 0          | 0                | 1           | 0                   | 0                             | 0                               | 1                           |

## A-2. Reform Indicator for Upstream Oil and Gas

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Law</i> | <i>Restructured</i> | <i>Privatized</i> | <i>Concessions</i> | <i>Regulator</i> | <i>Reform<br/>Indicator</i> |
|----------------|--|------------|---------------------|-------------------|--------------------|------------------|-----------------------------|
| Angola         | 1                                      | 1          | 0                   | 0                 | 1                  | 0                | 3                           |
| Benin          | 0                                      | 1          | 1                   | 0                 | 1                  | 1                | 4                           |
| Cameroon       | 1                                      | 1          | 0                   | 0                 | 1                  | 0                | 3                           |
| Congo B.       | 0                                      | 1          | 0                   | 0                 | 1                  | 0                | 2                           |
| Congo K.       | 0                                      | 0          | 1                   | 0                 | 1                  | 0                | 2                           |
| Cote d'Ivoire  | 1                                      | 1          | 1                   | 1                 | 1                  | 0                | 5                           |
| Mozambique     | 1                                      | 1          | 1                   | 0                 | 1                  | 0                | 4                           |
| Nigeria        | 1                                      | 1          | 1                   | 0                 | 1                  | 0                | 4                           |
| Senegal        | 1                                      | 1          | 0                   | 0                 | 1                  | 1                | 4                           |
| South Africa   | 1                                      | 1          | 1                   | 0                 | 0                  | 1                | 4                           |
| Tanzania       | 1                                      | 1          | 0                   | 0                 | 1                  | 1                | 4                           |
| China          | 0                                      | 1          | 0                   | 0                 | 0                  | 1                | 2                           |
| Indonesia      | 1                                      | 0          | 1                   | 0                 | 1                  | 0                | 3                           |
| Mongolia       | 1                                      | 0          | 0                   | 0                 | 0                  | 0                | 1                           |
| Thailand       | 1                                      | 1          | 1                   | 0                 | 1                  | 1                | 5                           |
| Vietnam        | 1                                      | 1          | 1                   | 0                 | 0                  | 0                | 3                           |
| Albania        | 0                                      | 1          | 0                   | 0                 | 1                  | 1                | 3                           |
| Azerbaijan     | 0                                      | 0          | 0                   | 0                 | 0                  | 0                | 0                           |
| Belarus        | 1                                      | 0          | 0                   | 0                 | 0                  | 0                | 1                           |
| Bulgaria       | 1                                      | 0          | 1                   | 0                 | 1                  | 0                | 3                           |
| Croatia        | 1                                      | 1          | 0                   | 0                 | 0                  | 0                | 2                           |
| Estonia        | 1                                      | 1          | 1                   | 0                 | 0                  | 0                | 3                           |
| Georgia        | 1                                      | 0          | 0                   | 0                 | 1                  | 0                | 2                           |
| Hungary        | 1                                      | 1          | 0                   | 1                 | 1                  | 0                | 4                           |
| Kazakhstan     | 1                                      | 1          | 1                   | 0                 | 1                  | 0                | 4                           |
| Kyrgyz Rep.    | 0                                      | 1          | 0                   | 0                 | 1                  | 0                | 2                           |
| Poland         | 1                                      | 1          | 0                   | 0                 | 1                  | 1                | 4                           |
| Romania        | 0                                      | 1          | 0                   | 0                 | 1                  | 1                | 3                           |
| Russia         | 1                                      | 1          | 1                   | 1                 | 1                  | 1                | 6                           |
| Turkey         | 1                                      | 0          | 1                   | 0                 | 1                  | 0                | 3                           |
| Turkmenistan   | 0                                      | 1          | 0                   | 0                 | 0                  | 0                | 1                           |
| Ukraine        | 1                                      | 1          | 0                   | 1                 | 0                  | 0                | 3                           |
| Uzbekistan     | 0                                      | 0          | 0                   | 0                 | 1                  | 0                | 1                           |
| Argentina      | 1                                      | 1          | 0                   | 1                 | 1                  | 1                | 5                           |

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Law</i> | <i>Restructured</i> | <i>Privatized</i> | <i>Concessions</i> | <i>Regulator</i> | <i>Reform<br/>Indicator</i> |
|----------------|--|------------|---------------------|-------------------|--------------------|------------------|-----------------------------|
| Bolivia        | 1                                      | 1          | 1                   | 1                 | 1                  | 1                | 6                           |
| Brazil         | 1                                      | 1          | 0                   | 0                 | 1                  | 1                | 4                           |
| Chile          | 0                                      | 0          | 0                   | 0                 | 0                  | 0                | 0                           |
| Colombia       | 0                                      | 0          | 0                   | 0                 | 0                  | 0                | 0                           |
| Ecuador        | 1                                      | 1          | 0                   | 0                 | 1                  | 0                | 3                           |
| Mexico         | 0                                      | 0          | 0                   | 0                 | 0                  | 0                | 0                           |
| Peru           | 1                                      | 1          | 1                   | 1                 | 1                  | 1                | 6                           |
| Algeria        | 1                                      | 1          | 1                   | 0                 | 1                  | 0                | 4                           |
| Egypt          | 1                                      | 0          | 1                   | 0                 | 1                  | 0                | 3                           |
| Iran           | 0                                      | 0          | 0                   | 0                 | 0                  | 0                | 0                           |
| Jordan         | 1                                      | 1          | 0                   | 0                 | 1                  | 0                | 3                           |
| Yemen          | 1                                      | 1          | 0                   | 0                 | 1                  | 0                | 3                           |
| Bangladesh     | 0                                      | 1          | 1                   | 0                 | 1                  | 0                | 3                           |
| India          | 0                                      | 1          | 1                   | 0                 | 1                  | 1                | 4                           |
| Pakistan       | 1                                      | 0          | 1                   | 0                 | 0                  | 0                | 2                           |

1. The following countries have had private upstream oil/gas for more than ten years:  
Gabon, Ghana, Papua New Guinea, Philippines, Guatemala.

2. The other countries have no upstream oil and gas subsector.

## A-3. Reform Indicator for Downstream Gas

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Law</i> | <i>Restructured</i> | <i>Regulator</i> | <i>Private<br/>Investment</i> | <i>Distribution<br/>Privatized</i> | <i>Reform<br/>Indicator</i> |
|----------------|--|------------|---------------------|------------------|-------------------------------|------------------------------------|-----------------------------|
| Angola         | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Ghana          | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Mozambique     | 1                                      | 1          | 1                   | 0                | 0                             | 0                                  | 3                           |
| Nigeria        | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| South Africa   | 1                                      | 0          | 1                   | 1                | 1                             | 1                                  | 5                           |
| Tanzania       | 0                                      | 1          | 0                   | 1                | 1                             | 0                                  | 3                           |
| China          | 1                                      | 0          | 0                   | 1                | 0                             | 0                                  | 2                           |
| Indonesia      | 1                                      | 1          | 0                   | 0                | 1                             | 0                                  | 3                           |
| Thailand       | 1                                      | 1          | 0                   | 0                | 0                             | 0                                  | 2                           |
| Vietnam        | 1                                      | 0          | 1                   | 0                | 0                             | 0                                  | 2                           |
| Albania        | 0                                      | 0          | 0                   | 1                | 0                             | 0                                  | 1                           |
| Armenia        | 1                                      | 1          | 1                   | 1                | 0                             | 0                                  | 4                           |
| Azerbaijan     | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Belarus        | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Bosnia         | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Bulgaria       | 1                                      | 0          | 0                   | 0                | 1                             | 0                                  | 2                           |
| Czech Rep.     | 1                                      | 1          | 0                   | 1                | 0                             | 0                                  | 3                           |
| Croatia        | 1                                      | 0          | 0                   | 0                | 0                             | 1                                  | 2                           |
| Estonia        | 1                                      | 1          | 0                   | 1                | 1                             | 1                                  | 5                           |
| Georgia        | 1                                      | 0          | 1                   | 0                | 1                             | 1                                  | 4                           |
| Hungary        | 1                                      | 1          | 1                   | 1                | 0                             | 1                                  | 5                           |
| Kazakhstan     | 1                                      | 1          | 1                   | 0                | 1                             | 1                                  | 5                           |
| Kyrgyz Rep.    | 0                                      | 1          | 0                   | 0                | 0                             | 0                                  | 1                           |
| Latvia         | 1                                      | 1          | 1                   | 1                | 0                             | 1                                  | 5                           |
| Macedonia      | 0                                      | 1          | 0                   | 0                | 0                             | 0                                  | 1                           |
| Moldova        | 1                                      | 0          | 1                   | 1                | 1                             | 0                                  | 4                           |
| Lithuania      | 1                                      | 0          | 0                   | 1                | 0                             | 0                                  | 2                           |
| Poland         | 1                                      | 1          | 0                   | 1                | 0                             | 0                                  | 3                           |
| Romania        | 0                                      | 0          | 0                   | 1                | 0                             | 0                                  | 1                           |
| Russia         | 1                                      | 0          | 1                   | 1                | 1                             | 1                                  | 5                           |
| Slovakia       | 0                                      | 0          | 0                   | 0                | 0                             | 1                                  | 1                           |
| Slovenia       | 1                                      | 0          | 0                   | 0                | 0                             | 0                                  | 1                           |
| Tajikistan     | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Turkey         | 1                                      | 0          | 0                   | 0                | 0                             | 0                                  | 1                           |

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Law</i> | <i>Restructured</i> | <i>Regulator</i> | <i>Private<br/>Investment</i> | <i>Distribution<br/>Privatized</i> | <i>Reform<br/>Indicator</i> |
|----------------|--|------------|---------------------|------------------|-------------------------------|------------------------------------|-----------------------------|
| Turkmenistan   | 1                                      | 0          | 0                   | 0                | 0                             | 0                                  | 1                           |
| Ukraine        | 0                                      | 0          | 1                   | 0                | 0                             | 1                                  | 2                           |
| Uzbekistan     | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Argentina      | 1                                      | 1          | 1                   | 1                | 1                             | 1                                  | 6                           |
| Bolivia        | 0                                      | 1          | 1                   | 1                | 1                             | 0                                  | 4                           |
| Brazil         | 1                                      | 1          | 0                   | 1                | 0                             | 1                                  | 4                           |
| Columbia       | 1                                      | 1          | 1                   | 1                | 1                             | 1                                  | 6                           |
| Chile          | 0                                      | 0          | 1                   | 0                | 0                             | 0                                  | 1                           |
| Ecuador        | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Mexico         | 0                                      | 1          | 1                   | 1                | 1                             | 1                                  | 5                           |
| Nicaragua      | 1                                      | 1          | 0                   | 1                | 1                             | 1                                  | 5                           |
| Peru           | 1                                      | 1          | 0                   | 1                | 0                             | 0                                  | 3                           |
| Algeria        | 1                                      | 0          | 0                   | 0                | 0                             | 0                                  | 1                           |
| Egypt          | 1                                      | 0          | 1                   | 0                | 0                             | 0                                  | 2                           |
| Iran           | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Morocco        | 1                                      | 0          | 0                   | 0                | 0                             | 0                                  | 1                           |
| Tunisia        | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Yemen          | 0                                      | 0          | 0                   | 0                | 0                             | 0                                  | 0                           |
| Bangladesh     | 1                                      | 1          | 1                   | 0                | 1                             | 0                                  | 4                           |
| India          | 1                                      | 1          | 1                   | 1                | 0                             | 0                                  | 4                           |
| Pakistan       | 1                                      | 0          | 0                   | 0                | 0                             | 0                                  | 1                           |

1. The following countries have had private downstream gas for more than ten years: Cape Verde, Cote d'Ivoire, Guatemala, Honduras, Mali, Panama, Papua New Guinea, Dominican Republic, Senegal, Uruguay.
2. The remaining 50 countries have no downstream gas sector.

## A-4a. Reform Indicator for Downstream Oil: Refining

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Private Investment</i> | <i>Privatized</i> | <i>Reform Indicator</i> |
|----------------|--|---------------------------|-------------------|-------------------------|
| Angola         | 1                                      | 1                         | 0                 | 2                       |
| Ghana          | 1                                      | 0                         | 0                 | 1                       |
| Cameroon       | 0                                      | 0                         | 0                 | 0                       |
| Congo B.       | 0                                      | 0                         | 0                 | 0                       |
| Congo K.       | 0                                      | 0                         | 0                 | 0                       |
| Gabon          | 0                                      | 0                         | 0                 | 0                       |
| Kenya          | 1                                      | 0                         | 0                 | 1                       |
| Madagascar     | 1                                      | 0                         | 0                 | 1                       |
| Nigeria        | 0                                      | 0                         | 0                 | 0                       |
| Tanzania       | 1                                      | 0                         | 0                 | 1                       |
| Zambia         | 1                                      | 1                         | 0                 | 2                       |
| China          | 0                                      | 0                         | 0                 | 0                       |
| Indonesia      | 1                                      | 0                         | 0                 | 1                       |
| Philippines    | 1                                      | 1                         | 1                 | 3                       |
| Thailand       | 1                                      | 1                         | 1                 | 3                       |
| Albania        | 0                                      | 0                         | 0                 | 0                       |
| Azerbaijan     | 0                                      | 0                         | 0                 | 0                       |
| Belarus        | 0                                      | 0                         | 0                 | 0                       |
| Bulgaria       | 1                                      | 1                         | 1                 | 3                       |
| Croatia        | 0                                      | 0                         | 0                 | 0                       |
| Czech Rep.     | 1                                      | 0                         | 1                 | 2                       |
| Estonia        | 1                                      | 1                         | 1                 | 3                       |
| Georgia        | 0                                      | 0                         | 0                 | 0                       |
| Hungary        | 1                                      | 0                         | 1                 | 2                       |
| Kazakhstan     | 1                                      | 0                         | 1                 | 2                       |
| Kyrgyz Rep.    | 0                                      | 0                         | 0                 | 0                       |
| Latvia         | 1                                      | 1                         | 1                 | 3                       |
| Lithuania      | 1                                      | 0                         | 0                 | 1                       |
| Macedonia      | 1                                      | 0                         | 0                 | 1                       |
| Poland         | 1                                      | 1                         | 0                 | 2                       |
| Romania        | 0                                      | 0                         | 1                 | 1                       |
| Russia         | 1                                      | 1                         | 1                 | 3                       |
| Slovakia       | 1                                      | 0                         | 1                 | 2                       |
| Turkey         | 1                                      | 1                         | 0                 | 2                       |

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Private Investment</i> | <i>Privatized</i> | <i>Reform Indicator</i> |
|----------------|--|---------------------------|-------------------|-------------------------|
| Turkmenistan   | 0                                      | 1                         | 0                 | 1                       |
| Ukraine        | 1                                      | 0                         | 1                 | 2                       |
| Uzbekistan     | 0                                      | 0                         | 0                 | 0                       |
| Argentina      | 1                                      | 0                         | 1                 | 2                       |
| Bolivia        | 0                                      | 0                         | 0                 | 0                       |
| Brazil         | 0                                      | 0                         | 0                 | 0                       |
| Colombia       | 0                                      | 0                         | 0                 | 0                       |
| Costa Rica     | 0                                      | 0                         | 0                 | 0                       |
| Chile          | 1                                      | 0                         | 0                 | 1                       |
| Ecuador        | 0                                      | 0                         | 0                 | 0                       |
| Jamaica        | 1                                      | 0                         | 0                 | 1                       |
| Mexico         | 0                                      | 0                         | 0                 | 0                       |
| Peru           | 1                                      | 1                         | 1                 | 3                       |
| Uruguay        | 1                                      | 0                         | 0                 | 1                       |
| Algeria        | 0                                      | 0                         | 0                 | 0                       |
| Egypt          | 1                                      | 0                         | 0                 | 1                       |
| Iran           | 0                                      | 0                         | 0                 | 0                       |
| Morocco        | 1                                      | 0                         | 1                 | 2                       |
| Tunisia        | 0                                      | 0                         | 0                 | 0                       |
| Yemen          | 0                                      | 0                         | 0                 | 0                       |
| Bangladesh     | 0                                      | 0                         | 0                 | 0                       |
| India          | 1                                      | 1                         | 1                 | 3                       |
| Sri Lanka      | 1                                      | 0                         | 0                 | 1                       |

1. The following countries have had private refining for more than ten years: Cape Verde, Cote d'Ivoire, Mauritania, Senegal, Sierra Leone, South Africa, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Jordan, Pakistan.
2. The remaining 44 countries do not have a refining sector.



## A-4b. Reform Indicator for Downstream Oil: Wholesale and Retail

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Privatized</i> | <i>Free<br/>Retail Price</i> | <i>Reform Indicator</i> |
|----------------|--|-------------------|------------------------------|-------------------------|
| Angola         | 0                                      | 0                 | 0                            | 0                       |
| Benin          | 0                                      | 0                 | 0                            | 0                       |
| C.A.R.         | 0                                      | 0                 | 0                            | 0                       |
| Comoros        | 0                                      | 0                 | 0                            | 0                       |
| Congo B.       | 0                                      | 1                 | 0                            | 1                       |
| Congo K.       | 0                                      | 0                 | 0                            | 0                       |
| Ethiopia       | 1                                      | 1                 | 0                            | 2                       |
| Eritrea        | 0                                      | 0                 | 0                            | 0                       |
| Gabon          | 0                                      | 1                 | 0                            | 1                       |
| Guinea B       | 1                                      | 1                 | 1                            | 3                       |
| Guinea C       | 1                                      | 0                 | 0                            | 1                       |
| Madagascar     | 1                                      | 0                 | 0                            | 1                       |
| Malawi         | 0                                      | 0                 | 0                            | 0                       |
| Niger          | 0                                      | 0                 | 0                            | 0                       |
| Somalia        | 0                                      | 0                 | 0                            | 0                       |
| Sierra Leone   | 0                                      | 0                 | 0                            | 0                       |
| Zimbabwe       | 1                                      | 0                 | 0                            | 1                       |
| Cambodia       | 0                                      | 0                 | 0                            | 0                       |
| China          | 0                                      | 0                 | 0                            | 0                       |
| Indonesia      | 1                                      | 0                 | 0                            | 1                       |
| Lao PDR        | 0                                      | 0                 | 0                            | 0                       |
| Mongolia       | 0                                      | 0                 | 0                            | 0                       |
| Philippines    | 1                                      | 0                 | 0                            | 1                       |
| Thailand       | 1                                      | 0                 | 1                            | 2                       |
| Vietnam        | 1                                      | 0                 | 0                            | 1                       |
| Albania        | 0                                      | 0                 | 1                            | 1                       |
| Armenia        | 0                                      | 0                 | 0                            | 0                       |
| Azerbaijan     | 0                                      | 1                 | 0                            | 1                       |
| Belarus        | 0                                      | 0                 | 0                            | 0                       |
| Bosnia         | 0                                      | 0                 | 0                            | 0                       |
| Bulgaria       | 1                                      | 0                 | 0                            | 1                       |
| Croatia        | 0                                      | 0                 | 0                            | 0                       |
| Czech Rep.     | 1                                      | 1                 | 1                            | 3                       |
| Estonia        | 1                                      | 1                 | 1                            | 3                       |

| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Privatized</i> | <i>Free<br/>Retail Price</i> | <i>Reform Indicator</i> |
|----------------|--|-------------------|------------------------------|-------------------------|
| Georgia        | 0                                      | 0                 | 1                            | 1                       |
| Hungary        | 1                                      | 1                 | 1                            | 3                       |
| Kazakhstan     | 1                                      | 1                 | 0                            | 2                       |
| Kyrgyz Rep.    | 0                                      | 0                 | 0                            | 0                       |
| Latvia         | 0                                      | 1                 | 1                            | 2                       |
| Lithuania      | 1                                      | 1                 | 1                            | 3                       |
| Macedonia      | 1                                      | 1                 | 0                            | 2                       |
| Poland         | 1                                      | 0                 | 1                            | 2                       |
| Romania        | 1                                      | 1                 | 1                            | 3                       |
| Russia         | 1                                      | 1                 | 1                            | 3                       |
| Slovakia       | 1                                      | 1                 | 1                            | 3                       |
| Slovenia       | 1                                      | 0                 | 0                            | 1                       |
| Tajikistan     | 0                                      | 0                 | 0                            | 0                       |
| Turkey         | 1                                      | 0                 | 0                            | 1                       |
| Turkmenistan   | 0                                      | 0                 | 0                            | 0                       |
| Ukraine        | 0                                      | 0                 | 0                            | 0                       |
| Uzbekistan     | 0                                      | 0                 | 0                            | 0                       |
| Argentina      | 1                                      | 1                 | 1                            | 3                       |
| Bolivia        | 0                                      | 0                 | 0                            | 0                       |
| Brazil         | 0                                      | 0                 | 1                            | 1                       |
| Colombia       | 0                                      | 0                 | 0                            | 0                       |
| Costa Rica     | 0                                      | 0                 | 1                            | 1                       |
| Chile          | 0                                      | 0                 | 0                            | 0                       |
| Ecuador        | 0                                      | 0                 | 0                            | 0                       |
| Mexico         | 0                                      | 0                 | 0                            | 0                       |
| Nicaragua      | 1                                      | 0                 | 1                            | 2                       |
| Peru           | 1                                      | 1                 | 1                            | 3                       |
| Uruguay        | 1                                      | 0                 | 0                            | 1                       |
| Algeria        | 0                                      | 1                 | 0                            | 1                       |
| Egypt          | 1                                      | 0                 | 0                            | 1                       |
| Iran           | 0                                      | 0                 | 0                            | 0                       |
| Morocco        | 1                                      | 1                 | 0                            | 2                       |
| Yemen          | 0                                      | 0                 | 0                            | 0                       |
| Bangladesh     | 0                                      | 0                 | 0                            | 0                       |
| India          | 1                                      | 0                 | 0                            | 1                       |
| Nepal          | 0                                      | 0                 | 0                            | 0                       |

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| <i>Country</i> | <i>Commercialized<br/>Corporatized</i> | <i>Privatized</i> | <i>Free<br/>Retail Price</i> | <i>Reform Indicator</i> |
|----------------|--|-------------------|------------------------------|-------------------------|
| Pakistan       | 1                                      | 0                 | 0                            | 1                       |
| Sri Lanka      | 1                                      | 1                 | 0                            | 2                       |

1. The remaining 43 countries have had private wholesale and retail oil for more than ten years.



# **Appendix B**

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## **Reform Indicators for All Energy Subsectors**



## Reform Indicators for All Energy Subsectors

| Country        | Power | Upstream Oil & Gas | Oil Refining | Wholesale & Retail Oil | Downstream Gas |
|----------------|-------|--------------------|--------------|------------------------|----------------|
| Angola         | 0     | 3                  | 2            | 0                      | 0              |
| Benin          | 0     | 4                  | NA           | 0                      | NA             |
| Botswana       | 1     | NA                 | NA           | private                | NA             |
| Burkina Faso   | 1     | NA                 | NA           | private                | NA             |
| Burundi        | 0     | NA                 | NA           | private                | NA             |
| C.A.R.         | 0     | NA                 | NA           | 0                      | NA             |
| Cape Verde     | 0     | NA                 | private      | private                | private        |
| Cameroon       | 0     | 3                  | 0            | private                | NA             |
| Chad           | 0     | NA                 | NA           | private                | NA             |
| Comoros        | 0     | NA                 | NA           | 0                      | NA             |
| Congo B.       | 0     | 2                  | 0            | 1                      | NA             |
| Congo K.       | 0     | 2                  | 0            | 0                      | NA             |
| Cote d' Ivoire | 4     | 5                  | private      | private                | private        |
| Djibouti       | 0     | NA                 | NA           | private                | NA             |
| Eq. Guinea     | 0     | NA                 | NA           | private                | NA             |
| Eritrea        | 0     | NA                 | NA           | 0                      | NA             |
| Ethiopia       | 2     | NA                 | NA           | 2                      | NA             |
| Gabon          | 3     | private            | 0            | 1                      | NA             |
| Gambia         | 1     | NA                 | NA           | private                | NA             |
| Ghana          | 2     | private            | 1            | private                | 0              |
| Guinea Bissau  | 0     | NA                 | NA           | 3                      | NA             |
| Guinea Conakry | 0     | NA                 | NA           | 1                      | NA             |
| Kenya          | 5     | NA                 | 1            | private                | NA             |
| Lesotho        | 1     | NA                 | NA           | private                | NA             |
| Liberia        | 0     | NA                 | NA           | private                | NA             |
| Madagascar     | 0     | NA                 | 1            | 1                      | NA             |
| Malawi         | 2     | NA                 | NA           | 0                      | NA             |
| Mali           | 0     | NA                 | NA           | private                | private        |
| Mauritania     | 0     | NA                 | private      | private                | NA             |
| Mauritius      | 1     | NA                 | NA           | private                | NA             |
| Mozambique     | 3     | 4                  | NA           | private                | 3              |
| Namibia        | 1     | NA                 | NA           | private                | NA             |
| Niger          | 0     | NA                 | NA           | 0                      | NA             |
| Nigeria        | 0     | 4                  | 0            | private                | 0              |
| Rwanda         | 0     | NA                 | NA           | private                | NA             |

| Country          | Power | Upstream Oil & Gas | Oil Refining | Wholesale & Retail Oil | Downstream Gas |
|------------------|-------|--------------------|--------------|------------------------|----------------|
| Sao Tome         | 0     | NA                 | NA           | private                | NA             |
| Senegal          | 3     | 4                  | private      | private                | private        |
| Seychelles       | 0     | NA                 | NA           | private                | NA             |
| Sierra Leone     | 0     | NA                 | private      | 0                      | NA             |
| Somalia          | 0     | NA                 | NA           | 0                      | NA             |
| South Africa     | 5     | 4                  | private      | private                | 5              |
| Sudan            | 0     | NA                 | NA           | private                | NA             |
| Swaziland        | 1     | NA                 | NA           | private                | NA             |
| Tanzania         | 1     | 4                  | 1            | private                | 3              |
| Togo             | 0     | NA                 | NA           | private                | NA             |
| Uganda           | 2     | NA                 | NA           | private                | NA             |
| Zambia           | 1     | NA                 | 2            | private                | NA             |
| Zimbabwe         | 2     | NA                 | NA           | 1                      | NA             |
| Cambodia         | 3     | NA                 | NA           | 0                      | NA             |
| China            | 5     | 2                  | 0            | 0                      | 2              |
| Indonesia        | 2     | 3                  | 1            | 1                      | 3              |
| Lao PDR          | 3     | NA                 | NA           | 0                      | NA             |
| Mongolia         | 2     | 1                  | NA           | 0                      | NA             |
| Papua New Guinea | 2     | private            | NA           | private                | private        |
| Philippines      | 3     | private            | 3            | 1                      | NA             |
| Thailand         | 2     | 5                  | 3            | 2                      | 2              |
| Vietnam          | 0     | 3                  | NA           | 1                      | 2              |
| Albania          | 5     | 3                  | 0            | 1                      | 1              |
| Armenia          | 6     | NA                 | NA           | 0                      | 4              |
| Azerbaijan       | 0     | 0                  | 0            | 1                      | 0              |
| Belarus          | 0     | 0                  | 0            | 0                      | 0              |
| Bosnia           | 2     | NA                 | NA           | 0                      | 0              |
| Bulgaria         | 2     | 3                  | 3            | 1                      | 2              |
| Croatia          | 1     | 2                  | 0            | 0                      | 2              |
| Czech Republic   | 4     | NA                 | 2            | 3                      | 3              |
| Estonia          | 4     | 3                  | 3            | 3                      | 5              |
| Georgia          | 6     | 2                  | 0            | 1                      | 4              |
| Hungary          | 6     | 4                  | 2            | 3                      | 5              |
| Kazakhstan       | 4     | 4                  | 2            | 2                      | 5              |
| Kyrgyz Republic  | 0     | 2                  | 0            | 0                      | 1              |
| Latvia           | 4     | NA                 | 3            | 2                      | 5              |



| Country            | Power | Upstream Oil & Gas | Oil Refining | Wholesale & Retail Oil | Downstream Gas |
|--------------------|-------|--------------------|--------------|------------------------|----------------|
| Lithuania          | 2     | NA                 | 1            | 3                      | 2              |
| Macedonia          | 2     | NA                 | 1            | 2                      | 1              |
| Moldova            | 3     | NA                 | NA           | private                | 4              |
| Poland             | 6     | 4                  | 2            | 2                      | 3              |
| Romania            | 0     | 3                  | 1            | 3                      | 1              |
| Russia             | 4     | 6                  | 3            | 3                      | 5              |
| Slovakia           | 0     | NA                 | 2            | 3                      | 1              |
| Slovenia           | 2     | NA                 | NA           | 1                      | 1              |
| Tajikistan         | 0     | NA                 | NA           | 0                      | 0              |
| Turkey             | 5     | 3                  | 2            | 1                      | 1              |
| Turkmenistan       | 0     | 1                  | 1            | 0                      | 1              |
| Ukraine            | 5     | 3                  | 2            | 0                      | 2              |
| Uzbekistan         | 0     | 1                  | 0            | 0                      | 0              |
| Argentina          | 6     | 5                  | 2            | 3                      | 6              |
| Bolivia            | 5     | 6                  | 0            | 0                      | 4              |
| Brazil             | 5     | 4                  | 0            | 1                      | 4              |
| Colombia           | 6     | 0                  | 0            | 0                      | 6              |
| Costa Rica         | 4     | NA                 | 0            | 1                      | NA             |
| Chile              | 6     | 0                  | 1            | 0                      | 1              |
| Dominican Republic | 3     | NA                 | private      | private                | private        |
| Ecuador            | 4     | 3                  | 0            | 0                      | 0              |
| El Salvador        | 6     | NA                 | private      | private                | NA             |
| Guatemala          | 6     | private            | private      | private                | private        |
| Honduras           | 2     | NA                 | NA           | private                | private        |
| Jamaica            | 5     | NA                 | 1            | private                | NA             |
| Mexico             | 3     | 0                  | 0            | 0                      | 5              |
| Nicaragua          | 3     | NA                 | private      | 2                      | 5              |
| Panama             | 6     | NA                 | private      | private                | private        |
| Paraguay           | 0     | NA                 | NA           | private                | NA             |
| Peru               | 6     | 6                  | 3            | 3                      | 3              |
| Uruguay            | 1     | NA                 | 1            | 1                      | private        |
| Algeria            | 0     | 4                  | 0            | 1                      | 1              |
| Egypt              | 1     | 3                  | 1            | 1                      | 2              |
| Iran               | 1     | 0                  | 0            | 0                      | 0              |
| Jordan             | 3     | 3                  | private      | private                | NA             |
| Lebanon            | 0     | NA                 | NA           | private                | NA             |

| Country    | Power | Upstream Oil & Gas | Oil Refining | Wholesale & Retail Oil | Downstream Gas |
|------------|-------|--------------------|--------------|------------------------|----------------|
| Morocco    | 3     | NA                 | 2            | 2                      | 1              |
| Tunisia    | 0     | private            | 0            | private                | 0              |
| Yemen      | 0     | 3                  | 0            | 0                      | 0              |
| Bangladesh | 1     | 3                  | 0            | 0                      | 4              |
| India      | 6     | 4                  | 3            | 1                      | 4              |
| Nepal      | 2     | NA                 | NA           | 0                      | NA             |
| Pakistan   | 5     | 2                  | private      | 1                      | 1              |
| Sri Lanka  | 1     | NA                 | 1            | 2                      | NA             |

1. "NA" denotes that the country does not have this activity.

2. "Private" denotes that parts of this sector have been in private ownership for more than ten years.

# **Appendix C**

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## **Private Investment in New Projects (Greenfield Sites)**



**Private Investment in New Projects  
(Greenfield Sites)**

| <i>Country</i> | <i>Power</i> | <i>Upstream<br/>Oil &amp; Gas</i> | <i>Refining</i> | <i>Downstream Gas</i> |
|----------------|--------------|-----------------------------------|-----------------|-----------------------|
| Angola         | NO           | YES                               | YES             | NO                    |
| Benin          | NO           | YES                               | ***             | ***                   |
| Botswana       | NO           | ***                               | ***             | ***                   |
| Burkina Faso   | YES          | ***                               | ***             | ***                   |
| Burundi        | NO           | ***                               | ***             | ***                   |
| C.A.R.         | NO           | ***                               | ***             | ***                   |
| Cape Verde     | NO           | ***                               | p               | p                     |
| Cameroon       | NO           | YES                               | ***             | ***                   |
| Chad           | NO           | ***                               | ***             | ***                   |
| Comoros        | NO           | ***                               | ***             | ***                   |
| Congo B.       | NO           | YES                               | NO              | ***                   |
| Congo K.       | NO           | YES                               | NO              | ***                   |
| Cote d' Ivoire | YES          | YES                               | p               | p                     |
| Djibouti       | NO           | ***                               | ***             | ***                   |
| Eq. Guinea     | NO           | ***                               | ***             | ***                   |
| Eritrea        | NO           | ***                               | ***             | ***                   |
| Ethiopia       | NO           | ***                               | ***             | ***                   |
| Gabon          | NO           | p                                 | NO              | ***                   |
| Gambia         | NO           | ***                               | NO              | ***                   |
| Ghana          | NO           | p                                 | ***             | NO                    |
| Guinea Bissau  | NO           | ***                               | ***             | ***                   |
| Guinea Conakry | NO           | ***                               | ***             | ***                   |
| Kenya          | YES          | ***                               | NO              | ***                   |
| Lesotho        | NO           | ***                               | ***             | ***                   |
| Liberia        | NO           | ***                               | ***             | ***                   |
| Madagascar     | NO           | ***                               | NO              | ***                   |
| Malawi         | NO           | ***                               | ***             | ***                   |
| Mali           | NO           | ***                               | ***             | p                     |
| Mauritania     | NO           | ***                               | p               | ***                   |
| Mauritius      | YES          | ***                               | ***             | ***                   |
| Mozambique     | YES          | YES                               | ***             | NO                    |
| Namibia        | NO           | ***                               | ***             | ***                   |
| Niger          | NO           | ***                               | ***             | ***                   |
| Nigeria        | NO           | YES                               | NO              | NO                    |

| <i>Country</i>      | <i>Power</i> | <i>Upstream<br/>Oil &amp; Gas</i> | <i>Refining</i> | <i>Downstream Gas</i> |
|---------------------|--------------|-----------------------------------|-----------------|-----------------------|
| Rwanda              | NO           | ***                               | ***             | ***                   |
| Sao Tome & Principe | NO           | ***                               | ***             | ***                   |
| Senegal             | YES          | YES                               | p               | p                     |
| Seychelles          | NO           | ***                               | ***             | ***                   |
| Sierra Leone        | NO           | ***                               | p               | ***                   |
| Somalia             | NO           | ***                               | ***             | ***                   |
| South Africa        | NO           | NO                                | p               | YES                   |
| Sudan               | NO           | ***                               | ***             | ***                   |
| Swaziland           | NO           | ***                               | ***             | ***                   |
| Tanzania            | YES          | YES                               | NO              | YES                   |
| Togo                | NO           | ***                               | ***             | ***                   |
| Uganda              | YES          | ***                               | ***             | ***                   |
| Zambia              | NO           | ***                               | YES             | ***                   |
| Zimbabwe            | YES          | ***                               | ***             | ***                   |
| Cambodia            | YES          | ***                               | ***             | ***                   |
| China               | YES          | NO                                | NO              | NO                    |
| Indonesia           | YES          | YES                               | NO              | YES                   |
| Lao PDR             | YES          | ***                               | ***             | ***                   |
| Mongolia            | NO           | NO                                | ***             | ***                   |
| Papua New Guinea    | YES          | p                                 | ***             | p                     |
| Philippines         | YES          | p                                 | YES             | ***                   |
| Thailand            | YES          | YES                               | YES             | NO                    |
| Vietnam             | NO           | NO                                | ***             | NO                    |
| Albania             | NO           | YES                               | NO              | NO                    |
| Armenia             | YES          | ***                               | ***             | NO                    |
| Azerbaijan          | NO           | NO                                | NO              | NO                    |
| Belarus             | NO           | NO                                | NO              | NO                    |
| Bosnia              | NO           | ***                               | NO              | NO                    |
| Bulgaria            | NO           | YES                               | YES             | YES                   |
| Croatia             | YES          | YES                               | NO              | NO                    |
| Czech Republic      | YES          | ***                               | NO              | NO                    |
| Estonia             | NO           | NO                                | YES             | YES                   |
| Georgia             | YES          | YES                               | NO              | YES                   |
| Hungary             | YES          | YES                               | NO              | NO                    |
| Kazakhstan          | YES          | YES                               | NO              | YES                   |
| Kyrgyz Republic     | NO           | YES                               | NO              | NO                    |

| <i>Country</i>     | <i>Power</i> | <i>Upstream<br/>Oil &amp; Gas</i> | <i>Refining</i> | <i>Downstream Gas</i> |
|--------------------|--------------|-----------------------------------|-----------------|-----------------------|
| Latvia             | YES          | ***                               | YES             | NO                    |
| Lithuania          | NO           | ***                               | NO              | ***                   |
| Macedonia          | NO           | ***                               | NO              | NO                    |
| Moldova            | NO           | ***                               | ***             | YES                   |
| Poland             | YES          | YES                               | YES             | NO                    |
| Romania            | NO           | YES                               | NO              | NO                    |
| Russia             | NO           | YES                               | YES             | YES                   |
| Slovakia           | NO           | ***                               | NO              | NO                    |
| Slovenia           | NO           | ***                               | ***             | NO                    |
| Tajikistan         | NO           | ***                               | ***             | NO                    |
| Turkey             | YES          | YES                               | YES             | NO                    |
| Turkmenistan       | NO           | NO                                | YES             | NO                    |
| Ukraine            | NO           | NO                                | NO              | NO                    |
| Uzbekistan         | NO           | YES                               | NO              | NO                    |
| Argentina          | YES          | YES                               | NO              | YES                   |
| Bolivia            | NO           | YES                               | NO              | YES                   |
| Brazil             | YES          | YES                               | NO              | NO                    |
| Colombia           | YES          | NO                                | NO              | YES                   |
| Costa Rica         | YES          | ***                               | NO              | ***                   |
| Chile              | YES          | NO                                | NO              | NO                    |
| Dominican Republic | YES          | ***                               | p               | ***                   |
| Ecuador            | YES          | YES                               | NO              | NO                    |
| El Salvador        | YES          | ***                               | p               | ***                   |
| Guatemala          | YES          | p                                 | p               | ***                   |
| Honduras           | YES          | ***                               | p               | p                     |
| Jamaica            | YES          | ***                               | NO              | ***                   |
| Mexico             | YES          | NO                                | NO              | YES                   |
| Nicaragua          | YES          | ***                               | p               | YES                   |
| Panama             | YES          | ***                               | p               | p                     |
| Paraguay           | NO           | ***                               | ***             | ***                   |
| Peru               | YES          | YES                               | YES             | NO                    |
| Uruguay            | NO           | ***                               | NO              | p                     |
| Algeria            | NO           | YES                               | NO              | NO                    |
| Egypt              | NO           | YES                               | NO              | NO                    |
| Iran               | NO           | NO                                | NO              | NO                    |
| Jordan             | NO           | YES                               | p               | ***                   |

| <i>Country</i> | <i>Power</i> | <i>Upstream<br/>Oil &amp; Gas</i> | <i>Refining</i> | <i>Downstream Gas</i> |
|----------------|--------------|-----------------------------------|-----------------|-----------------------|
| Lebanon        | NO           | ***                               | ***             | ***                   |
| Morocco        | YES          | ***                               | NO              | NO                    |
| Tunisia        | NO           | p                                 | NO              | NO                    |
| Yemen          | NO           | YES                               | NO              | NO                    |
| Bangladesh     | YES          | YES                               | NO              | YES                   |
| India          | YES          | YES                               | YES             | NO                    |
| Nepal          | YES          | ***                               | ***             | ***                   |
| Pakistan       | YES          | NO                                | p               | NO                    |
| Sri Lanka      | YES          | ***                               | NO              | ***                   |

Notes:

- “YES” indicates that the country has private investment in new projects.
- “NO” indicates that the country does not have private investment in new projects.
- “P” indicates that the utility has had private ownership in part or in total for at least 10 years.
- \*\*\* indicates that the country does not have this activity.



# Appendix D

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## Privatization of Existing Assets



## Privatization of Existing Assets

| <i>Country</i> | <i>Power</i> | <i>Upstream<br/>Oil &amp; Gas</i> | <i>Refining</i> | <i>Wholesale &amp;<br/>Retail Oil</i> | <i>Downstream Gas</i> |
|----------------|--------------|-----------------------------------|-----------------|---------------------------------------|-----------------------|
| Angola         | NO           | NO                                | NO              | NO                                    | NO                    |
| Benin          | NO           | NO                                | ***             | NO                                    | ***                   |
| Botswana       | NO           | ***                               | ***             | p                                     | ***                   |
| Burkina Faso   | NO           | ***                               | ***             | p                                     | ***                   |
| Burundi        | NO           | ***                               | ***             | p                                     | ***                   |
| C.A.R.         | NO           | ***                               | ***             | NO                                    | ***                   |
| Cape Verde     | NO           | ***                               | p               | p                                     | p                     |
| Cameroon       | NO           | NO                                | NO              | p                                     | ***                   |
| Chad           | NO           | ***                               | ***             | p                                     | ***                   |
| Comoros        | NO           | ***                               | ***             | NO                                    | ***                   |
| Congo B.       | NO           | NO                                | NO              | YES                                   | ***                   |
| Congo K.       | NO           | NO                                | NO              | NO                                    | ***                   |
| Cote d' Ivoire | YES          | YES                               | p               | p                                     | p                     |
| Djibouti       | NO           | ***                               | ***             | p                                     | ***                   |
| Eq. Guinea     | NO           | ***                               | ***             | p                                     | ***                   |
| Eritrea        | NO           | ***                               | ***             | NO                                    | ***                   |
| Ethiopia       | NO           | ***                               | ***             | YES                                   | ***                   |
| Gabon          | YES          | p                                 | NO              | YES                                   | ***                   |
| Gambia         | NO           | ***                               | ***             | p                                     | ***                   |
| Ghana          | NO           | p                                 | NO              | p                                     | NO                    |
| Guinea Bissau  | NO           | ***                               | ***             | YES                                   | ***                   |
| Guinea Conakry | NO           | ***                               | ***             | NO                                    | ***                   |
| Kenya          | NO           | ***                               | NO              | p                                     | ***                   |
| Lesotho        | NO           | ***                               | ***             | p                                     | ***                   |
| Liberia        | NO           | ***                               | ***             | p                                     | ***                   |
| Madagascar     | NO           | ***                               | NO              | NO                                    | ***                   |
| Malawi         | NO           | ***                               | ***             | NO                                    | ***                   |
| Mali           | NO           | ***                               | ***             | p                                     | p                     |
| Mauritania     | NO           | ***                               | p               | p                                     | ***                   |
| Mauritius      | NO           | ***                               | ***             | p                                     | ***                   |
| Mozambique     | YES          | NO                                | ***             | p                                     | NO                    |
| Namibia        | NO           | ***                               | ***             | p                                     | ***                   |
| Niger          | NO           | ***                               | ***             | NO                                    | ***                   |
| Nigeria        | NO           | NO                                | NO              | p                                     | NO                    |

| <i>Country</i>    | <i>Power</i> | <i>Upstream Oil &amp; Gas</i> | <i>Refining</i> | <i>Wholesale &amp; Retail Oil</i> | <i>Downstream Gas</i> |
|-------------------|--------------|-------------------------------|-----------------|-----------------------------------|-----------------------|
| Rwanda            | NO           | ***                           | ***             | p                                 | ***                   |
| Sao Tome&Principe | NO           | ***                           | ***             | p                                 | ***                   |
| Senegal           | NO           | NO                            | p               | p                                 | p                     |
| Seychelles        | NO           | ***                           | ***             | p                                 | ***                   |
| Sierra Leone      | NO           | ***                           | p               | NO                                | ***                   |
| Somalia           | NO           | ***                           | ***             | NO                                | ***                   |
| South Africa      | YES          | NO                            | p               | p                                 | YES                   |
| Sudan             | NO           | ***                           | ***             | p                                 | ***                   |
| Swaziland         | NO           | ***                           | ***             | p                                 | ***                   |
| Tanzania          | NO           | NO                            | NO              | p                                 | NO                    |
| Togo              | NO           | ***                           | ***             | p                                 | ***                   |
| Uganda            | NO           | ***                           | ***             | p                                 | ***                   |
| Zambia            | NO           | ***                           | NO              | p                                 | ***                   |
| Zimbabwe          | NO           | ***                           | ***             | NO                                | ***                   |
| Cambodia          | NO           | ***                           | ***             | NO                                | ***                   |
| China             | YES          | NO                            | NO              | NO                                | NO                    |
| Indonesia         | NO           | NO                            | NO              | NO                                | NO                    |
| Lao PDR           | NO           | ***                           | ***             | NO                                | ***                   |
| Mongolia          | NO           | NO                            | ***             | NO                                | ***                   |
| Papua New Guinea  | NO           | p                             | ***             | p                                 | p                     |
| Philippines       | YES          | p                             | YES             | NO                                | ***                   |
| Thailand          | YES          | NO                            | YES             | NO                                | NO                    |
| Vietnam           | NO           | NO                            | ***             | NO                                | NO                    |
| Albania           | YES          | NO                            | NO              | NO                                | NO                    |
| Armenia           | YES          | ***                           | ***             | NO                                | NO                    |
| Azerbaijan        | NO           | NO                            | NO              | YES                               | NO                    |
| Belarus           | NO           | NO                            | NO              | NO                                | NO                    |
| Bosnia            | YES          | ***                           | ***             | NO                                | NO                    |
| Bulgaria          | NO           | NO                            | YES             | NO                                | NO                    |
| Croatia           | NO           | 2                             | NO              | NO                                | YES                   |
| Czech Republic    | NO           | ***                           | YES             | YES                               | NO                    |
| Estonia           | NO           | NO                            | YES             | YES                               | YES                   |
| Georgia           | YES          | NO                            | NO              | NO                                | YES                   |
| Hungary           | YES          | YES                           | YES             | YES                               | YES                   |
| Kazakhstan        | YES          | NO                            | YES             | YES                               | YES                   |
| Kyrgyz Republic   | NO           | NO                            | NO              | NO                                | NO                    |

| <i>Country</i>     | <i>Power</i> | <i>Upstream Oil &amp; Gas</i> | <i>Refining</i> | <i>Wholesale &amp; Retail Oil</i> | <i>Downstream Gas</i> |
|--------------------|--------------|-------------------------------|-----------------|-----------------------------------|-----------------------|
| Latvia             | NO           | ***                           | YES             | YES                               | NO                    |
| Lithuania          | NO           | ***                           | NO              | YES                               | NO                    |
| Macedonia          | NO           | ***                           | NO              | YES                               | NO                    |
| Moldova            | NO           | ***                           | ***             | p                                 | NO                    |
| Poland             | YES          | NO                            | NO              | NO                                | NO                    |
| Romania            | NO           | NO                            | YES             | YES                               | NO                    |
| Russia             | YES          | YES                           | YES             | YES                               | YES                   |
| Slovakia           | NO           | ***                           | YES             | YES                               | YES                   |
| Slovenia           | NO           | ***                           | ***             | NO                                | NO                    |
| Tajikistan         | NO           | ***                           | ***             | NO                                | NO                    |
| Turkey             | YES          | NO                            | NO              | NO                                | NO                    |
| Turkmenistan       | NO           | NO                            | NO              | NO                                | NO                    |
| Ukraine            | YES          | YES                           | YES             | NO                                | YES                   |
| Uzbekistan         | NO           | NO                            | NO              | NO                                | NO                    |
| Argentina          | YES          | YES                           | YES             | YES                               | YES                   |
| Bolivia            | YES          | YES                           | NO              | NO                                | NO                    |
| Brazil             | YES          | NO                            | NO              | NO                                | YES                   |
| Colombia           | YES          | NO                            | NO              | NO                                | YES                   |
| Costa Rica         | NO           | ***                           | NO              | NO                                | ***                   |
| Chile              | YES          | NO                            | NO              | NO                                | NO                    |
| Dominican Republic | NO           | ***                           | p               | p                                 | p                     |
| Ecuador            | NO           | NO                            | NO              | NO                                | NO                    |
| El Salvador        | YES          | ***                           | p               | p                                 | ***                   |
| Guatemala          | YES          | p                             | p               | p                                 | p                     |
| Honduras           | NO           | ***                           | ***             | p                                 | p                     |
| Jamaica            | NO           | ***                           | NO              | p                                 | ***                   |
| Mexico             | NO           | NO                            | NO              | NO                                | YES                   |
| Nicaragua          | NO           | ***                           | p               | NO                                | YES                   |
| Panama             | YES          | ***                           | NO              | p                                 | p                     |
| Paraguay           | NO           | ***                           | ***             | p                                 | ***                   |
| Peru               | YES          | YES                           | YES             | YES                               | NO                    |
| Uruguay            | NO           | ***                           | NO              | NO                                | p                     |
| Algeria            | NO           | NO                            | NO              | YES                               | NO                    |
| Egypt              | NO           | NO                            | NO              | NO                                | NO                    |
| Iran               | NO           | NO                            | NO              | NO                                | NO                    |
| Jordan             | NO           | NO                            | p               | p                                 | ***                   |

| <i>Country</i> | <i>Power</i> | <i>Upstream Oil &amp; Gas</i> | <i>Refining</i> | <i>Wholesale &amp; Retail Oil</i> | <i>Downstream Gas</i> |
|----------------|--------------|-------------------------------|-----------------|-----------------------------------|-----------------------|
| Lebanon        | NO           | ***                           | ***             | p                                 | ***                   |
| Morocco        | YES          | ***                           | YES             | YES                               | NO                    |
| Tunisia        | NO           | p                             | NO              | p                                 | NO                    |
| Yemen          | NO           | NO                            | NO              | NO                                | NO                    |
| Bangladesh     | NO           | NO                            | NO              | NO                                | NO                    |
| India          | YES          | NO                            | NO              | NO                                | NO                    |
| Nepal          | NO           | ***                           | ***             | NO                                | ***                   |
| Pakistan       | YES          | NO                            | p               | NO                                | NO                    |
| Sri Lanka      | NO           | ***                           | NO              | YES                               | ***                   |

Notes:

- “YES” indicates that a state-owned utility has been privatized in part or in total.
- “NO” indicates that a state-owned utility has not been privatized either in part or total.
- “p” indicates that the utility has had private ownership in part or in total for at least 10 years.
- \*\*\* means that the country does not have this activity.

# Appendix E

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## Frequency Distributions of the Number of Reform Steps Taken

**Figure E-1. The Frequency Distribution of the Number of Key Steps Taken in the Power Subsector**

**Figure E-2. Frequency Distribution of the Number of Key Steps Taken in the Upstream Oil & Gas Subsector**

**Figure E-3. Frequency Distribution of the Number of Key Steps Taken in the Downstream Gas Subsector**

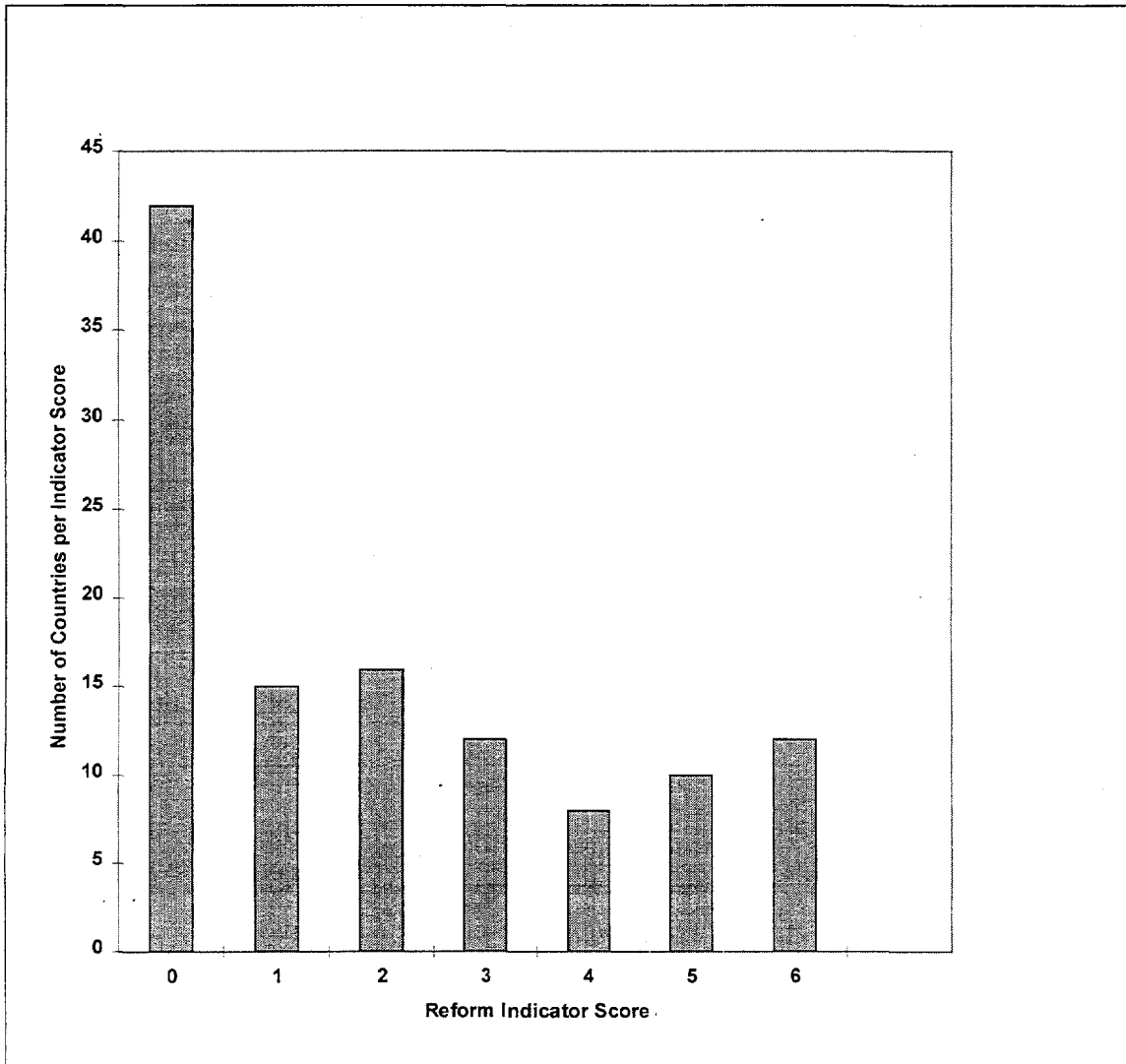
**Figure E-4a. Frequency Distribution of the Number of Key Steps Taken in the Downstream Oil Refining Subsector**

**Figure E-4b. Frequency Distribution of the Number of Key Steps Taken in the Downstream Oil Wholesale and Retail Subsector**





Figure E-1: Frequency Distribution of the Number of Key Steps Taken in the Power Subsector



**Figure E-2: Frequency Distribution of the Number of Key Steps Taken in the Upstream Oil & Gas Subsector**

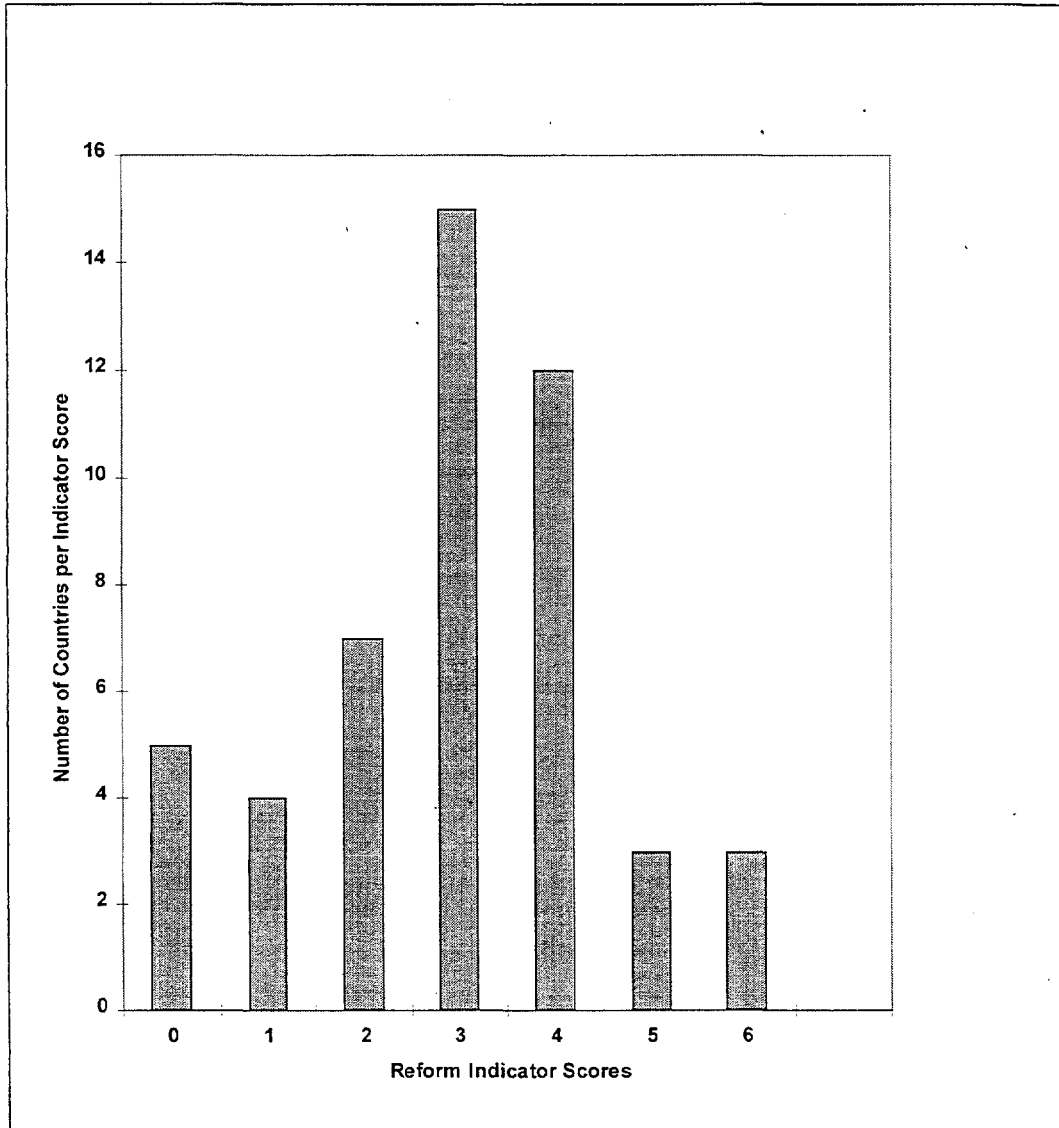
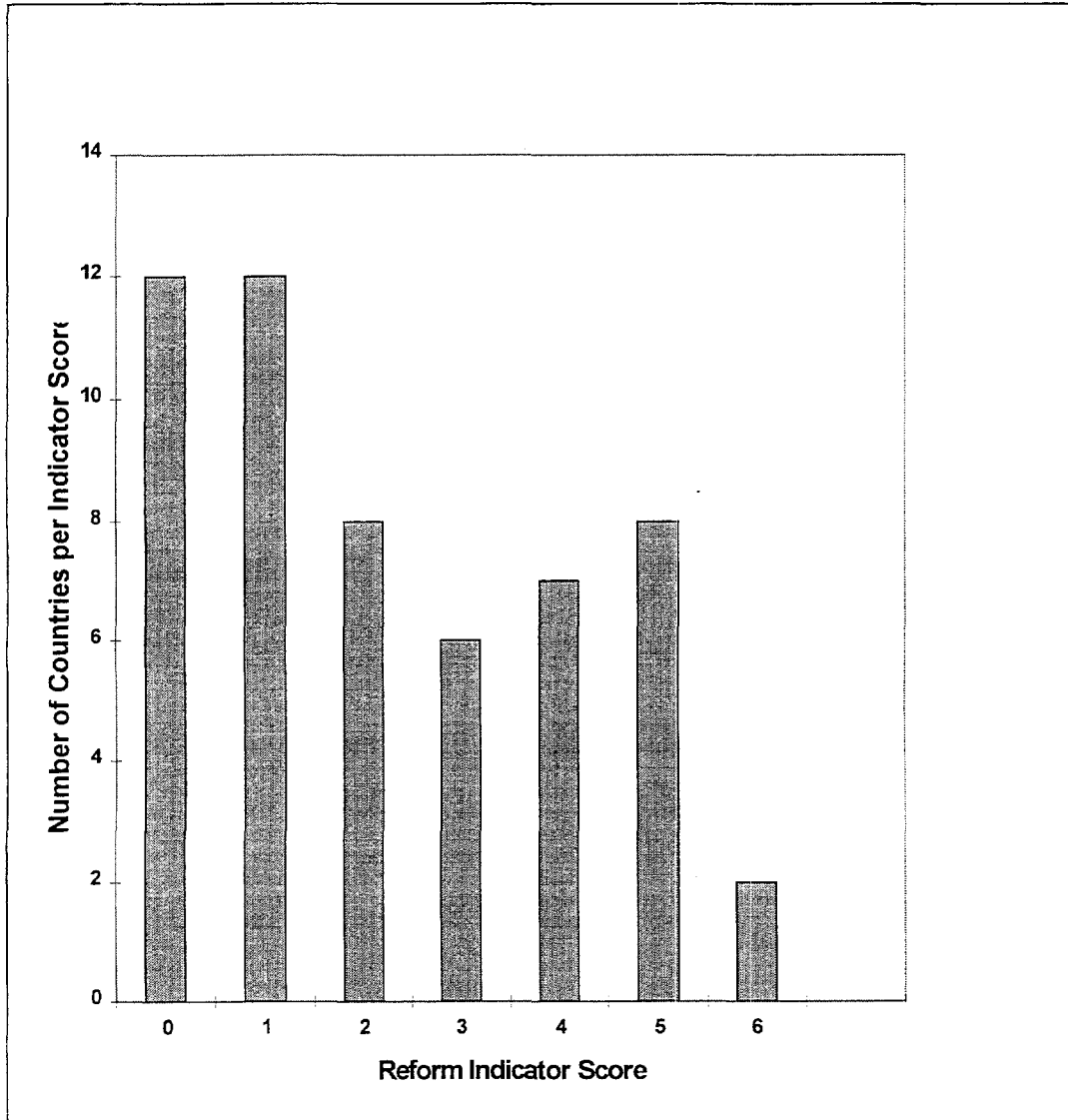
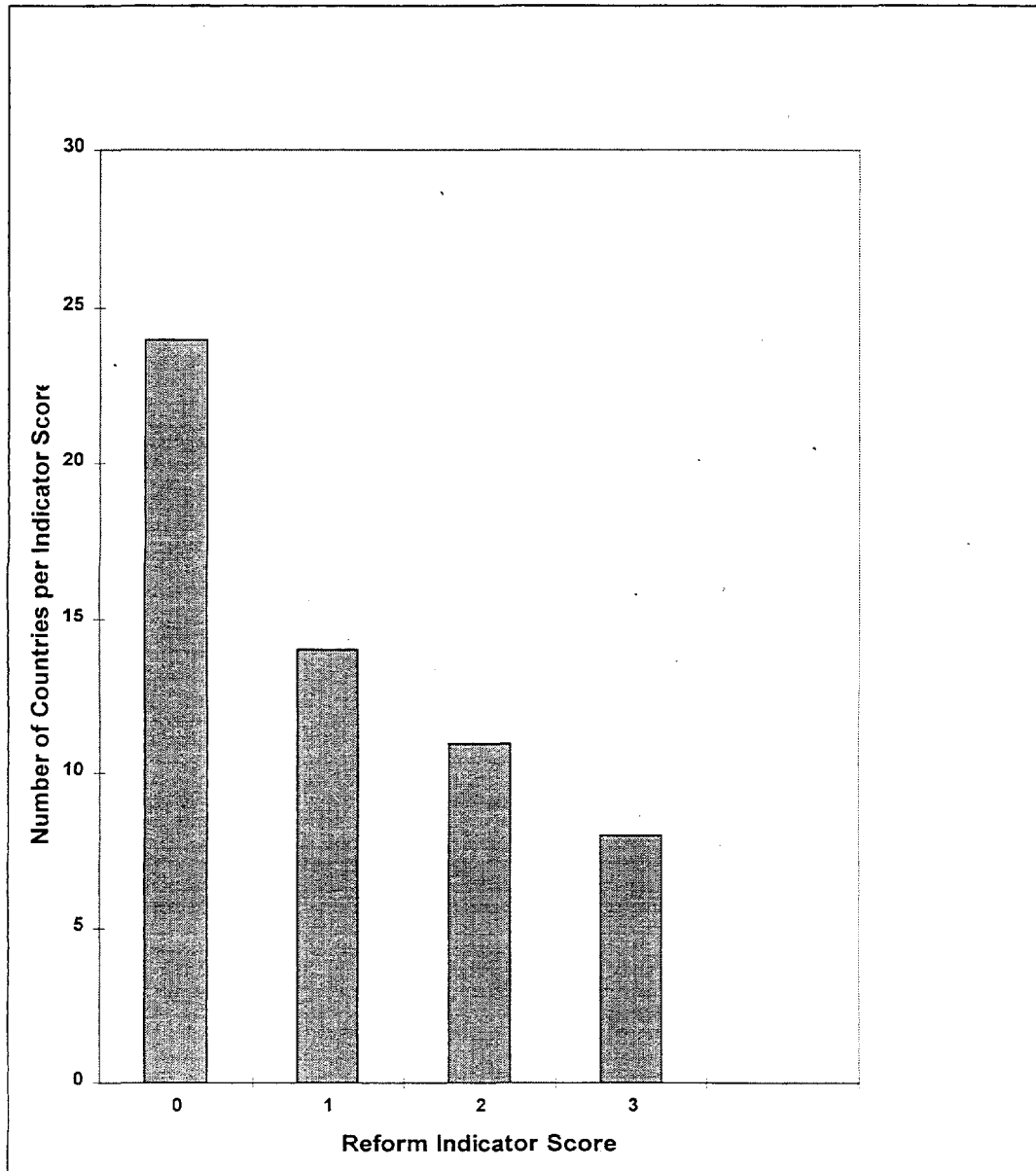


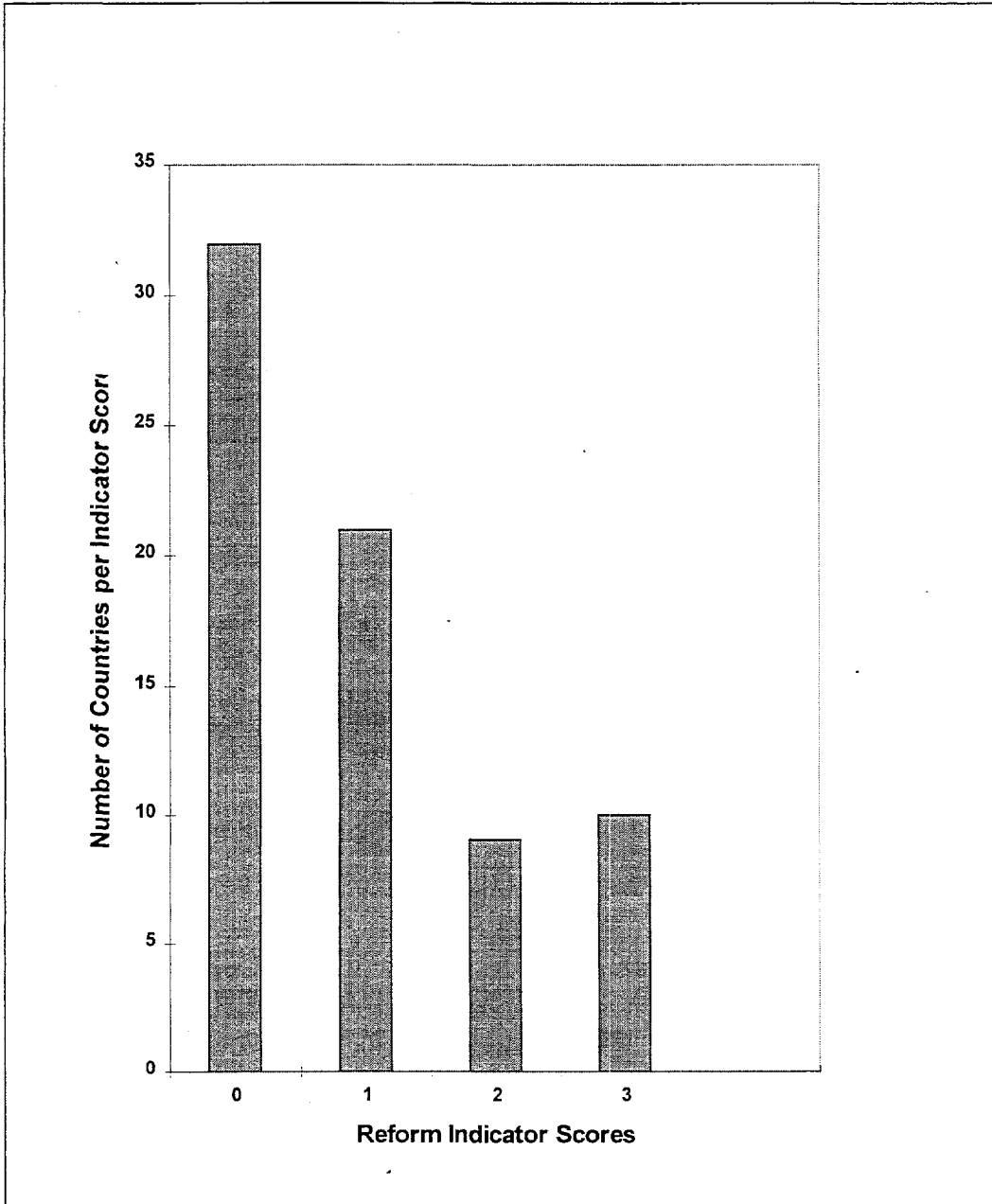
Figure E-3: Frequency Distribution of the Number of Key Steps Taken in the Downstream Gas Subsector



**Figure E-4a: Frequency Distribution of the Number of Key Steps Taken in the Downstream Oil Refining Subsector**



**Figure E-4b: Frequency Distribution of the Number of Key Steps Taken in the Downstream Oil Wholesale and Retail Subsector**





Joint UNDP/World Bank  
ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAMME (ESMAP)

LIST OF REPORTS ON COMPLETED ACTIVITIES

| <i>Region/Country</i>           | <i>Activity/Report Title</i>  | <i>Date</i> | <i>Number</i> |
|---------------------------------|---|-------------|---------------|
| <b>SUB-SAHARAN AFRICA (AFR)</b> |   |             |               |
| Africa Regional                 | Anglophone Africa Household Energy Workshop (English)   | 07/88       | 085/88        |
|                                 | Regional Power Seminar on Reducing Electric Power System Losses in Africa (English)                   | 08/88       | 087/88        |
|                                 | Institutional Evaluation of EGL (English)   | 02/89       | 098/89        |
|                                 | Biomass Mapping Regional Workshops (English)  | 05/89       | --            |
|                                 | Francophone Household Energy Workshop (French)  | 08/89       | --            |
|                                 | Interafrican Electrical Engineering College: Proposals for Short- and Long-Term Development (English) | 03/90       | 112/90        |
|                                 | Biomass Assessment and Mapping (English)  | 03/90       | --            |
|                                 | Symposium on Power Sector Reform and Efficiency Improvement in Sub-Saharan Africa (English)           | 06/96       | 182/96        |
|                                 | Commercialization of Marginal Gas Fields (English)  | 12/97       | 201/97        |
| Angola                          | Energy Assessment (English and Portuguese)  | 05/89       | 4708-ANG      |
|                                 | Power Rehabilitation and Technical Assistance (English)   | 10/91       | 142/91        |
| Benin                           | Energy Assessment (English and French)  | 06/85       | 5222-BEN      |
| Botswana                        | Energy Assessment (English)   | 09/84       | 4998-BT       |
|                                 | Pump Electrification Prefeasibility Study (English)   | 01/86       | 047/86        |
|                                 | Review of Electricity Service Connection Policy (English)   | 07/87       | 071/87        |
|                                 | Tuli Block Farms Electrification Study (English)  | 07/87       | 072/87        |
|                                 | Household Energy Issues Study (English)   | 02/88       | --            |
|                                 | Urban Household Energy Strategy Study (English)   | 05/91       | 132/91        |
| Burkina Faso                    | Energy Assessment (English and French)  | 01/86       | 5730-BUR      |
|                                 | Technical Assistance Program (English)  | 03/86       | 052/86        |
|                                 | Urban Household Energy Strategy Study (English and French)  | 06/91       | 134/91        |
| Burundi                         | Energy Assessment (English)   | 06/82       | 3778-BU       |
|                                 | Petroleum Supply Management (English)   | 01/84       | 012/84        |
|                                 | Status Report (English and French)  | 02/84       | 011/84        |
|                                 | Presentation of Energy Projects for the Fourth Five-Year Plan (1983-1987) (English and French)        | 05/85       | 036/85        |
|                                 | Improved Charcoal Cookstove Strategy (English and French)   | 09/85       | 042/85        |
|                                 | Peat Utilization Project (English)  | 11/85       | 046/85        |
|                                 | Energy Assessment (English and French)  | 01/92       | 9215-BU       |
| Cape Verde                      | Energy Assessment (English and Portuguese)  | 08/84       | 5073-CV       |
|                                 | Household Energy Strategy Study (English)   | 02/90       | 110/90        |
| Central African Republic        | Energy Assessment (French)  | 08/92       | 9898-CAR      |
| Chad                            | Elements of Strategy for Urban Household Energy The Case of N'djamena (French)                        | 12/93       | 160/94        |
| Comoros                         | Energy Assessment (English and French)  | 01/88       | 7104-COM      |
| Congo                           | Energy Assessment (English)   | 01/88       | 6420-COB      |
|                                 | Power Development Plan (English and French)   | 03/90       | 106/90        |
| Côte d'Ivoire                   | Energy Assessment (English and French)  | 04/85       | 5250-IVC      |
|                                 | Improved Biomass Utilization (English and French)   | 04/87       | 069/87        |
|                                 | Power System Efficiency Study (English)   | 12/87       | --            |
|                                 | Power Sector Efficiency Study (French)  | 02/92       | 140/91        |
|                                 | Project of Energy Efficiency in Buildings (English)   | 09/95       | 175/95        |

| <i>Region/Country</i>          | <i>Activity/Report Title</i>   | <i>Date</i> | <i>Number</i> |
|--------------------------------|--|-------------|---------------|
| Ethiopia                       | Energy Assessment (English)  | 07/84       | 4741-ET       |
|                                | Power System Efficiency Study (English)  | 10/85       | 045/85        |
|                                | Agricultural Residue Briquetting Pilot Project (English)   | 12/86       | 062/86        |
|                                | Bagasse Study (English)  | 12/86       | 063/86        |
|                                | Cooking Efficiency Project (English)   | 12/87       | --            |
|                                | Energy Assessment (English)  | 02/96       | 179/96        |
| Gabon                          | Energy Assessment (English)  | 07/88       | 6915-GA       |
| The Gambia                     | Energy Assessment (English)  | 11/83       | 4743-GM       |
|                                | Solar Water Heating Retrofit Project (English)   | 02/85       | 030/85        |
|                                | Solar Photovoltaic Applications (English)  | 03/85       | 032/85        |
|                                | Petroleum Supply Management Assistance (English)   | 04/85       | 035/85        |
| Ghana                          | Energy Assessment (English)  | 11/86       | 6234-GH       |
|                                | Energy Rationalization in the Industrial Sector (English)  | 06/88       | 084/88        |
|                                | Sawmill Residues Utilization Study (English)   | 11/88       | 074/87        |
|                                | Industrial Energy Efficiency (English)   | 11/92       | 148/92        |
| Guinea                         | Energy Assessment (English)  | 11/86       | 6137-GUI      |
|                                | Household Energy Strategy (English and French)   | 01/94       | 163/94        |
| Guinea-Bissau                  | Energy Assessment (English and Portuguese)   | 08/84       | 5083-GUB      |
|                                | Recommended Technical Assistance Projects (English & Portuguese)                                 | 04/85       | 033/85        |
|                                | Management Options for the Electric Power and Water Supply Subsectors (English)                  | 02/90       | 100/90        |
|                                | Power and Water Institutional Restructuring (French)   | 04/91       | 118/91        |
|                                | Energy Assessment (English)  | 05/82       | 3800-KE       |
|                                | Power System Efficiency Study (English)  | 03/84       | 014/84        |
| Kenya                          | Status Report (English)  | 05/84       | 016/84        |
|                                | Coal Conversion Action Plan (English)  | 02/87       | --            |
|                                | Solar Water Heating Study (English)  | 02/87       | 066/87        |
|                                | Peri-Urban Woodfuel Development (English)  | 10/87       | 076/87        |
|                                | Power Master Plan (English)  | 11/87       | --            |
|                                | Power Loss Reduction Study (English)   | 09/96       | 186/96        |
|                                | Energy Assessment (English)  | 01/84       | 4676-LSO      |
|                                | Energy Assessment (English)  | 12/84       | 5279-LBR      |
| Liberia                        | Recommended Technical Assistance Projects (English)  | 06/85       | 038/85        |
|                                | Power System Efficiency Study (English)  | 12/87       | 081/87        |
|                                | Energy Assessment (English)  | 01/87       | 5700-MAG      |
|                                | Power System Efficiency Study (English and French)   | 12/87       | 075/87        |
| Madagascar                     | Environmental Impact of Woodfuels (French)   | 10/95       | 176/95        |
|                                | Energy Assessment (English)  | 08/82       | 3903-MAL      |
|                                | Technical Assistance to Improve the Efficiency of Fuelwood Use in the Tobacco Industry (English) | 11/83       | 009/83        |
| Mali                           | Status Report (English)  | 01/84       | 013/84        |
|                                | Energy Assessment (English and French)   | 11/91       | 8423-MLI      |
|                                | Household Energy Strategy (English and French)   | 03/92       | 147/92        |
| Islamic Republic of Mauritania | Energy Assessment (English and French)   | 04/85       | 5224-MAU      |
|                                | Household Energy Strategy Study (English and French)   | 07/90       | 123/90        |
| Mauritius                      | Energy Assessment (English)  | 12/81       | 3510-MAS      |
|                                | Status Report (English)  | 10/83       | 008/83        |
|                                | Power System Efficiency Audit (English)  | 05/87       | 070/87        |



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| Mauritius             | Bagasse Power Potential (English)  | 10/87       | 077/87        |
|                       | Energy Sector Review (English)   | 12/94       | 3643-MAS      |
| Mozambique            | Energy Assessment (English)  | 01/87       | 6128-MOZ      |
|                       | Household Electricity Utilization Study (English)  | 03/90       | 113/90        |
|                       | Electricity Tariffs Study (English)  | 06/96       | 181/96        |
|                       | Sample Survey of Low Voltage Electricity Customers   | 06/97       | 195/97        |
| Namibia               | Energy Assessment (English)  | 03/93       | 11320-NAM     |
| Niger                 | Energy Assessment (French)   | 05/84       | 4642-NIR      |
|                       | Status Report (English and French)   | 02/86       | 051/86        |
|                       | Improved Stoves Project (English and French)   | 12/87       | 080/87        |
|                       | Household Energy Conservation and Substitution (English and French)  | 01/88       | 082/88        |
| Nigeria               | Energy Assessment (English)  | 08/83       | 4440-UNI      |
|                       | Energy Assessment (English)  | 07/93       | 11672-UNI     |
| Rwanda                | Energy Assessment (English)  | 06/82       | 3779-RW       |
|                       | Status Report (English and French)   | 05/84       | 017/84        |
|                       | Improved Charcoal Cookstove Strategy (English and French)  | 08/86       | 059/86        |
|                       | Improved Charcoal Production Techniques (English and French)   | 02/87       | 065/87        |
|                       | Energy Assessment (English and French)   | 07/91       | 8017-RW       |
|                       | Commercialization of Improved Charcoal Stoves and Carbonization Techniques Mid-Term Progress Report (English and French) | 12/91       | 141/91        |
| SADC                  | SADC Regional Power Interconnection Study, Vols. I-IV (English)  | 12/93       | --            |
| SADCC                 | SADCC Regional Sector: Regional Capacity-Building Program for Energy Surveys and Policy Analysis (English)               | 11/91       | --            |
| Sao Tome and Principe | Energy Assessment (English)  | 10/85       | 5803-STP      |
| Senegal               | Energy Assessment (English)  | 07/83       | 4182-SE       |
|                       | Status Report (English and French)   | 10/84       | 025/84        |
|                       | Industrial Energy Conservation Study (English)   | 05/85       | 037/85        |
|                       | Preparatory Assistance for Donor Meeting (English and French)  | 04/86       | 056/86        |
|                       | Urban Household Energy Strategy (English)  | 02/89       | 096/89        |
|                       | Industrial Energy Conservation Program (English)   | 05/94       | 165/94        |
| Seychelles            | Energy Assessment (English)  | 01/84       | 4693-SEY      |
|                       | Electric Power System Efficiency Study (English)   | 08/84       | 021/84        |
| Sierra Leone          | Energy Assessment (English)  | 10/87       | 6597-SL       |
| Somalia               | Energy Assessment (English)  | 12/85       | 5796-SO       |
| South Africa          | Options for the Structure and Regulation of Natural Gas Industry (English)   | 05/95       | 172/95        |
| Republic of Sudan     | Management Assistance to the Ministry of Energy and Mining   | 05/83       | 003/83        |
|                       | Energy Assessment (English)  | 07/83       | 4511-SU       |
|                       | Power System Efficiency Study (English)  | 06/84       | 018/84        |
|                       | Status Report (English)  | 11/84       | 026/84        |
|                       | Wood Energy/Forestry Feasibility (English)   | 07/87       | 073/87        |
| Swaziland             | Energy Assessment (English)  | 02/87       | 6262-SW       |
|                       | Household Energy Strategy Study  | 10/97       | 198/97        |
| Tanzania              | Energy Assessment (English)  | 11/84       | 4969-TA       |
|                       | Peri-Urban Woodfuels Feasibility Study (English)   | 08/88       | 086/88        |
|                       | Tobacco Curing Efficiency Study (English)  | 05/89       | 102/89        |
|                       | Remote Sensing and Mapping of Woodlands (English)  | 06/90       | --            |
|                       | Industrial Energy Efficiency Technical Assistance (English)  | 08/90       | 122/90        |

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| Tanzania                           | Power Loss Reduction Volume 1: Transmission and Distribution System Technical Loss Reduction and Network Development (English)     | 06/98       | 204A/98              |
|                                    | Power Loss Reduction Volume 2: Reduction of Non-Technical Losses (English)   | 06/98       | 204B/98              |
| Togo                               | Energy Assessment (English)  | 06/85       | 5221-TO              |
|                                    | Wood Recovery in the Nangbeto Lake (English and French)  | 04/86       | 055/86               |
|                                    | Power Efficiency Improvement (English and French)  | 12/87       | 078/87               |
| Uganda                             | Energy Assessment (English)  | 07/83       | 4453-UG              |
|                                    | Status Report (English)  | 08/84       | 020/84               |
|                                    | Institutional Review of the Energy Sector (English)  | 01/85       | 029/85               |
|                                    | Energy Efficiency in Tobacco Curing Industry (English)   | 02/86       | 049/86               |
|                                    | Fuelwood/Forestry Feasibility Study (English)  | 03/86       | 053/86               |
|                                    | Power System Efficiency Study (English)  | 12/88       | 092/88               |
|                                    | Energy Efficiency Improvement in the Brick and Tile Industry (English)   | 02/89       | 097/89               |
|                                    | Tobacco Curing Pilot Project (English)   | 03/89       | UNDP Terminal Report |
|                                    | Energy Assessment (English)  | 12/96       | 193/96               |
| Zaire                              | Energy Assessment (English)  | 05/86       | 5837-ZR              |
| Zambia                             | Energy Assessment (English)  | 01/83       | 4110-ZA              |
|                                    | Status Report (English)  | 08/85       | 039/85               |
|                                    | Energy Sector Institutional Review (English)   | 11/86       | 060/86               |
|                                    | Power Subsector Efficiency Study (English)   | 02/89       | 093/88               |
|                                    | Energy Strategy Study (English)  | 02/89       | 094/88               |
|                                    | Urban Household Energy Strategy Study (English)  | 08/90       | 121/90               |
| Zimbabwe                           | Energy Assessment (English)  | 06/82       | 3765-ZIM             |
|                                    | Power System Efficiency Study (English)  | 06/83       | 005/83               |
|                                    | Status Report (English)  | 08/84       | 019/84               |
|                                    | Power Sector Management Assistance Project (English)   | 04/85       | 034/85               |
|                                    | Power Sector Management Institution Building (English)   | 09/89       | --                   |
|                                    | Petroleum Management Assistance (English)  | 12/89       | 109/89               |
|                                    | Charcoal Utilization Prefeasibility Study (English)  | 06/90       | 119/90               |
|                                    | Integrated Energy Strategy Evaluation (English)  | 01/92       | 8768-ZIM             |
|                                    | Energy Efficiency Technical Assistance Project: Strategic Framework for a National Energy Efficiency Improvement Program (English) | 04/94       | --                   |
|                                    | Capacity Building for the National Energy Efficiency Improvement Programme (NEEIP) (English)                                       | 12/94       | --                   |
| <b>EAST ASIA AND PACIFIC (EAP)</b> |  |             |                      |
| Asia Regional                      | Pacific Household and Rural Energy Seminar (English)   | 11/90       | --                   |
| China                              | County-Level Rural Energy Assessments (English)  | 05/89       | 101/89               |
|                                    | Fuelwood Forestry Preinvestment Study (English)  | 12/89       | 105/89               |
|                                    | Strategic Options for Power Sector Reform in China (English)   | 07/93       | 156/93               |
|                                    | Energy Efficiency and Pollution Control in Township and Village Enterprises (TVE) Industry (English)                               | 11/94       | 168/94               |
|                                    | Energy for Rural Development in China: An Assessment Based on a Joint Chinese/ESMAP Study in Six Counties (English)                | 06/96       | 183/96               |
| Fiji                               | Energy Assessment (English)  | 06/83       | 4462-FIJ             |

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| Indonesia               | Energy Assessment (English)  | 11/81  | 3543-IND      |          |
|                         | Status Report (English)  | 09/84  | 022/84        |          |
|                         | Power Generation Efficiency Study (English)  | 02/86  | 050/86        |          |
|                         | Energy Efficiency in the Brick, Tile and<br>Lime Industries (English)  | 04/87  | 067/87        |          |
|                         | Diesel Generating Plant Efficiency Study (English)   | 12/88  | 095/88        |          |
|                         | Urban Household Energy Strategy Study (English)  | 02/90  | 107/90        |          |
|                         | Biomass Gasifier Preinvestment Study Vols. I & II (English)  | 12/90  | 124/90        |          |
|                         | Prospects for Biomass Power Generation with Emphasis on<br>Palm Oil, Sugar, Rubberwood and Plywood Residues (English)  | 11/94  | 167/94        |          |
|                         | Lao PDR  | Urban Electricity Demand Assessment Study (English)    | 03/93         | 154/93   |
|                         |  | Institutional Development for Off-Grid Electrification | 06/99         | 215/99   |
| Malaysia                | Sabah Power System Efficiency Study (English)  | 03/87  | 068/87        |          |
|                         | Gas Utilization Study (English)  | 09/91  | 9645-MA       |          |
| Myanmar                 | Energy Assessment (English)  | 06/85  | 5416-BA       |          |
| Papua New<br>Guinea     | Energy Assessment (English)  | 06/82  | 3882-PNG      |          |
|                         | Status Report (English)  | 07/83  | 006/83        |          |
|                         | Energy Strategy Paper (English)  | --   | --            |          |
|                         | Institutional Review in the Energy Sector (English)  | 10/84  | 023/84        |          |
|                         | Power Tariff Study (English)   | 10/84  | 024/84        |          |
| Philippines             | Commercial Potential for Power Production from<br>Agricultural Residues (English)  | 12/93  | 157/93        |          |
|                         | Energy Conservation Study (English)  | 08/94  | --            |          |
| Solomon Islands         | Energy Assessment (English)  | 06/83  | 4404-SOL      |          |
|                         | Energy Assessment (English)  | 01/92  | 979-SOL       |          |
| South Pacific           | Petroleum Transport in the South Pacific (English)   | 05/86  | --            |          |
| Thailand                | Energy Assessment (English)  | 09/85  | 5793-TH       |          |
|                         | Rural Energy Issues and Options (English)  | 09/85  | 044/85        |          |
|                         | Accelerated Dissemination of Improved Stoves and<br>Charcoal Kilns (English)   | 09/87  | 079/87        |          |
|                         | Northeast Region Village Forestry and Woodfuels<br>Preinvestment Study (English)   | 02/88  | 083/88        |          |
|                         | Impact of Lower Oil Prices (English)   | 08/88  | --            |          |
|                         | Coal Development and Utilization Study (English)   | 10/89  | --            |          |
|                         | Tonga  | Energy Assessment (English)                            | 06/85         | 5498-TON |
| Vanuatu                 | Energy Assessment (English)  | 06/85  | 5577-VA       |          |
| Vietnam                 | Rural and Household Energy-Issues and Options (English)  | 01/94  | 161/94        |          |
|                         | Power Sector Reform and Restructuring in Vietnam: Final Report<br>to the Steering Committee (English and Vietnamese)   | 09/95  | 174/95        |          |
|                         | Household Energy Technical Assistance: Improved Coal<br>Briquetting and Commercialized Dissemination of Higher<br>Efficiency Biomass and Coal Stoves (English) | 01/96  | 178/96        |          |
|                         | Western Samoa  | Energy Assessment (English)                            | 06/85         | 5497-WSO |
| <b>SOUTH ASIA (SAS)</b> |  |  |               |          |
| Bangladesh              | Energy Assessment (English)  | 10/82  | 3873-BD       |          |
|                         | Priority Investment Program (English)  | 05/83  | 002/83        |          |
|                         | Status Report (English)  | 04/84  | 015/84        |          |

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| Bangladesh            | Power System Efficiency Study (English)  | 02/85       | 031/85        |
|                       | Small Scale Uses of Gas Prefeasibility Study (English)   | 12/88       | --            |
| India                 | Opportunities for Commercialization of Nonconventional Energy Systems (English)                    | 11/88       | 091/88        |
|                       | Maharashtra Bagasse Energy Efficiency Project (English)  | 07/90       | 120/90        |
|                       | Mini-Hydro Development on Irrigation Dams and Canal Drops Vols. I, II and III (English)            | 07/91       | 139/91        |
|                       | WindFarm Pre-Investment Study (English)  | 12/92       | 150/92        |
|                       | Power Sector Reform Seminar (English)  | 04/94       | 166/94        |
|                       | Environmental Issues in the Power Sector (English)   | 06/98       | 205/98        |
|                       | Environmental Issues in the Power Sector: Manual for Environmental Decision Making (English)       | 06/99       | 213/99        |
|                       | Household Energy Strategies for Urban India: The Case of Hyderabad                                 | 06/99       | 214/99        |
| Nepal                 | Energy Assessment (English)  | 08/83       | 4474-NEP      |
|                       | Status Report (English)  | 01/85       | 028/84        |
|                       | Energy Efficiency & Fuel Substitution in Industries (English)                                      | 06/93       | 158/93        |
| Pakistan              | Household Energy Assessment (English)  | 05/88       | --            |
|                       | Assessment of Photovoltaic Programs, Applications, and Markets (English)                           | 10/89       | 103/89        |
|                       | National Household Energy Survey and Strategy Formulation Study: Project Terminal Report (English) | 03/94       | --            |
|                       | Managing the Energy Transition (English)   | 10/94       | --            |
|                       | Lighting Efficiency Improvement Program Phase 1: Commercial Buildings Five Year Plan (English)     | 10/94       | --            |
| Sri Lanka             | Energy Assessment (English)  | 05/82       | 3792-CE       |
|                       | Power System Loss Reduction Study (English)  | 07/83       | 007/83        |
|                       | Status Report (English)  | 01/84       | 010/84        |
|                       | Industrial Energy Conservation Study (English)   | 03/86       | 054/86        |

**EUROPE AND CENTRAL ASIA (ECA)**

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| Bulgaria                   | Natural Gas Policies and Issues (English)   | 10/96 | 188/96    |
| Central and Eastern Europe | Power Sector Reform in Selected Countries   | 07/97 | 196/97    |
| Eastern Europe             | The Future of Natural Gas in Eastern Europe (English)                             | 08/92 | 149/92    |
| Kazakhstan                 | Natural Gas Investment Study, Volumes 1, 2 & 3                                    | 12/97 | 199/97    |
| Kazakhstan & Kyrgyzstan    | Opportunities for Renewable Energy Development                                    | 11/97 | 16855-KAZ |
| Poland                     | Energy Sector Restructuring Program Vols. I-V (English)                           | 01/93 | 153/93    |
|                            | Natural Gas Upstream Pricing (English and Polish)                                 | 08/98 | 206/98    |
|                            | Energy Sector Restructuring Program: Establishing the Energy Regulation Authority | 10/98 | 208/98    |
| Portugal                   | Energy Assessment (English)   | 04/84 | 4824-PO   |
| Romania                    | Natural Gas Development Strategy (English)  | 12/96 | 192/96    |
| Slovenia                   | Workshop on Private Participation in the Power Sector (English)                   | 02/99 | 211/99    |
| Turkey                     | Energy Assessment (English)   | 03/83 | 3877-TU   |

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| <b>MIDDLE EAST AND NORTH AFRICA (MNA)</b>    |  |             |               |
| Arab Republic of Egypt                       | Energy Assessment (English)  | 10/96       | 189/96        |
| Morocco                                      | Energy Assessment (English and French)   | 03/84       | 4157-MOR      |
|  | Status Report (English and French)   | 01/86       | 048/86        |
|  | Energy Sector Institutional Development Study (English and French)                                       | 07/95       | 173/95        |
|  | Natural Gas Pricing Study (French)   | 10/98       | 209/98        |
|  | Gas Development Plan Phase II (French)   | 02/99       | 210/99        |
| Syria  | Energy Assessment (English)  | 05/86       | 5822-SYR      |
|  | Electric Power Efficiency Study (English)  | 09/88       | 089/88        |
|  | Energy Efficiency Improvement in the Cement Sector (English)   | 04/89       | 099/89        |
|  | Energy Efficiency Improvement in the Fertilizer Sector (English)   | 06/90       | 115/90        |
| Tunisia                                      | Fuel Substitution (English and French)   | 03/90       | --            |
|  | Power Efficiency Study (English and French)  | 02/92       | 136/91        |
|  | Energy Management Strategy in the Residential and Tertiary Sectors (English)                             | 04/92       | 146/92        |
|  | Renewable Energy Strategy Study, Volume I (French)   | 11/96       | 190A/96       |
|  | Renewable Energy Strategy Study, Volume II (French)  | 11/96       | 190B/96       |
| Yemen  | Energy Assessment (English)  | 12/84       | 4892-YAR      |
|  | Energy Investment Priorities (English)   | 02/87       | 6376-YAR      |
|  | Household Energy Strategy Study Phase I (English)  | 03/91       | 126/91        |
| <b>LATIN AMERICA AND THE CARIBBEAN (LAC)</b> |  |             |               |
| LAC Regional                                 | Regional Seminar on Electric Power System Loss Reduction in the Caribbean (English)                      | 07/89       | --            |
|  | Elimination of Lead in Gasoline in Latin America and the Caribbean (English and Spanish)                 | 04/97       | 194/97        |
|  | Elimination of Lead in Gasoline in Latin America and the Caribbean - Status Report (English and Spanish) | 12/97       | 200/97        |
|  | Harmonization of Fuels Specifications in Latin America and the Caribbean (English and Spanish)           | 06/98       | 203/98        |
| Bolivia                                      | Energy Assessment (English)  | 04/83       | 4213-BO       |
|  | National Energy Plan (English)   | 12/87       | --            |
|  | La Paz Private Power Technical Assistance (English)  | 11/90       | 111/90        |
|  | Prefeasibility Evaluation Rural Electrification and Demand Assessment (English and Spanish)              | 04/91       | 129/91        |
|  | National Energy Plan (Spanish)   | 08/91       | 131/91        |
|  | Private Power Generation and Transmission (English)  | 01/92       | 137/91        |
|  | Natural Gas Distribution: Economics and Regulation (English)   | 03/92       | 125/92        |
|  | Natural Gas Sector Policies and Issues (English and Spanish)   | 12/93       | 164/93        |
|  | Household Rural Energy Strategy (English and Spanish)  | 01/94       | 162/94        |
|  | Preparation of Capitalization of the Hydrocarbon Sector  | 12/96       | 191/96        |
| Brazil                                       | Energy Efficiency & Conservation: Strategic Partnership for Energy Efficiency in Brazil (English)        | 01/95       | 170/95        |
|  | Hydro and Thermal Power Sector Study   | 09/97       | 197/97        |
| Chile  | Energy Sector Review (English)   | 08/88       | 7129-CH       |

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| Colombia                       | Energy Strategy Paper (English)  | 12/86       | --            |
|                                | Power Sector Restructuring (English)   | 11/94       | 169/94        |
|                                | Energy Efficiency Report for the Commercial and Public Sector (English)  | 06/96       | 184/96        |
| Costa Rica                     | Energy Assessment (English and Spanish)  | 01/84       | 4655-CR       |
|                                | Recommended Technical Assistance Projects (English)  | 11/84       | 027/84        |
|                                | Forest Residues Utilization Study (English and Spanish)  | 02/90       | 108/90        |
| Dominican Republic             | Energy Assessment (English)  | 05/91       | 8234-DO       |
| Ecuador                        | Energy Assessment (Spanish)  | 12/85       | 5865-EC       |
|                                | Energy Strategy Phase I (Spanish)  | 07/88       | --            |
|                                | Energy Strategy (English)  | 04/91       | --            |
|                                | Private Minihydropower Development Study (English)   | 11/92       | --            |
|                                | Energy Pricing Subsidies and Interfuel Substitution (English)  | 08/94       | 11798-EC      |
|                                | Energy Pricing, Poverty and Social Mitigation (English)  | 08/94       | 12831-EC      |
|                                | Issues and Options in the Energy Sector (English)  | 09/93       | 12160-GU      |
| Guatemala                      | Issues and Options in the Energy Sector (English)  | 09/93       | 12160-GU      |
| Haiti                          | Energy Assessment (English and French)   | 06/82       | 3672-HA       |
|                                | Status Report (English and French)   | 08/85       | 041/85        |
|                                | Household Energy Strategy (English and French)   | 12/91       | 143/91        |
| Honduras                       | Energy Assessment (English)  | 08/87       | 6476-HO       |
|                                | Petroleum Supply Management (English)  | 03/91       | 128/91        |
| Jamaica                        | Energy Assessment (English)  | 04/85       | 5466-JM       |
|                                | Petroleum Procurement, Refining, and Distribution Study (English)  | 11/86       | 061/86        |
|                                | Energy Efficiency Building Code Phase I (English)  | 03/88       | --            |
|                                | Energy Efficiency Standards and Labels Phase I (English )  | 03/88       | --            |
|                                | Management Information System Phase I (English)  | 03/88       | --            |
|                                | Charcoal Production Project (English)  | 09/88       | 090/88        |
|                                | FIDCO Sawmill Residues Utilization Study (English)   | 09/88       | 088/88        |
|                                | Energy Sector Strategy and Investment Planning Study (English)   | 07/92       | 135/92        |
| Mexico                         | Improved Charcoal Production Within Forest Management for the State of Veracruz (English and Spanish)                  | 08/91       | 138/91        |
|                                | Energy Efficiency Management Technical Assistance to the Comision Nacional para el Ahorro de Energia (CONAE) (English) | 04/96       | 180/96        |
|                                | Power System Efficiency Study (English)  | 06/83       | 004/83        |
| Panama                         | Energy Assessment (English)  | 10/84       | 5145-PA       |
|                                | Recommended Technical Assistance Projects (English)  | 09/85       | --            |
|                                | Status Report (English and Spanish)  | 09/85       | 043/85        |
| Paraguay                       | Energy Assessment (English)  | 01/84       | 4677-PE       |
|                                | Status Report (English)  | 08/85       | 040/85        |
|                                | Proposal for a Stove Dissemination Program in the Sierra (English and Spanish)   | 02/87       | 064/87        |
|                                | Energy Strategy (English and Spanish)  | 12/90       | --            |
|                                | Study of Energy Taxation and Liberalization of the Hydrocarbons Sector (English and Spanish)                           | 120/93      | 159/93        |
|                                | Reform and Privatization in the Hydrocarbon Sector (English and Spanish)   | 07/99       | 216/99        |
|                                | Energy Assessment (English)  | 09/84       | 5111-SLU      |
| Saint Lucia                    | Energy Assessment (English)  | 09/84       | 5103-STV      |
| St. Vincent and the Grenadines | Energy Assessment (English)  | 09/84       | 5103-STV      |
| Trinidad and Tobago            | Energy Assessment (English)  | 12/85       | 5930-TR       |

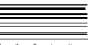
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| Sub Andean            | Environmental and Social Regulation of Oil and Gas Operations in Sensitive Areas of the Sub-Andean Basin (English and Spanish)     | 07/99       | 217/99        |
| <b>GLOBAL</b>         |  |             |               |
|                       | Energy End Use Efficiency: Research and Strategy (English)   | 11/89       | --            |
|                       | Women and Energy--A Resource Guide   |             |               |
|                       | The International Network: Policies and Experience (English)   | 04/90       | --            |
|                       | Guidelines for Utility Customer Management and Metering (English and Spanish)  | 07/91       | --            |
|                       | Assessment of Personal Computer Models for Energy Planning in Developing Countries (English)                                       | 10/91       | --            |
|                       | Long-Term Gas Contracts Principles and Applications (English)  | 02/93       | 152/93        |
|                       | Comparative Behavior of Firms Under Public and Private Ownership (English)   | 05/93       | 155/93        |
|                       | Development of Regional Electric Power Networks (English)  | 10/94       | --            |
|                       | Roundtable on Energy Efficiency (English)  | 02/95       | 171/95        |
|                       | Assessing Pollution Abatement Policies with a Case Study of Ankara (English)   | 11/95       | 177/95        |
|                       | A Synopsis of the Third Annual Roundtable on Independent Power Projects: Rhetoric and Reality (English)                            | 08/96       | 187/96        |
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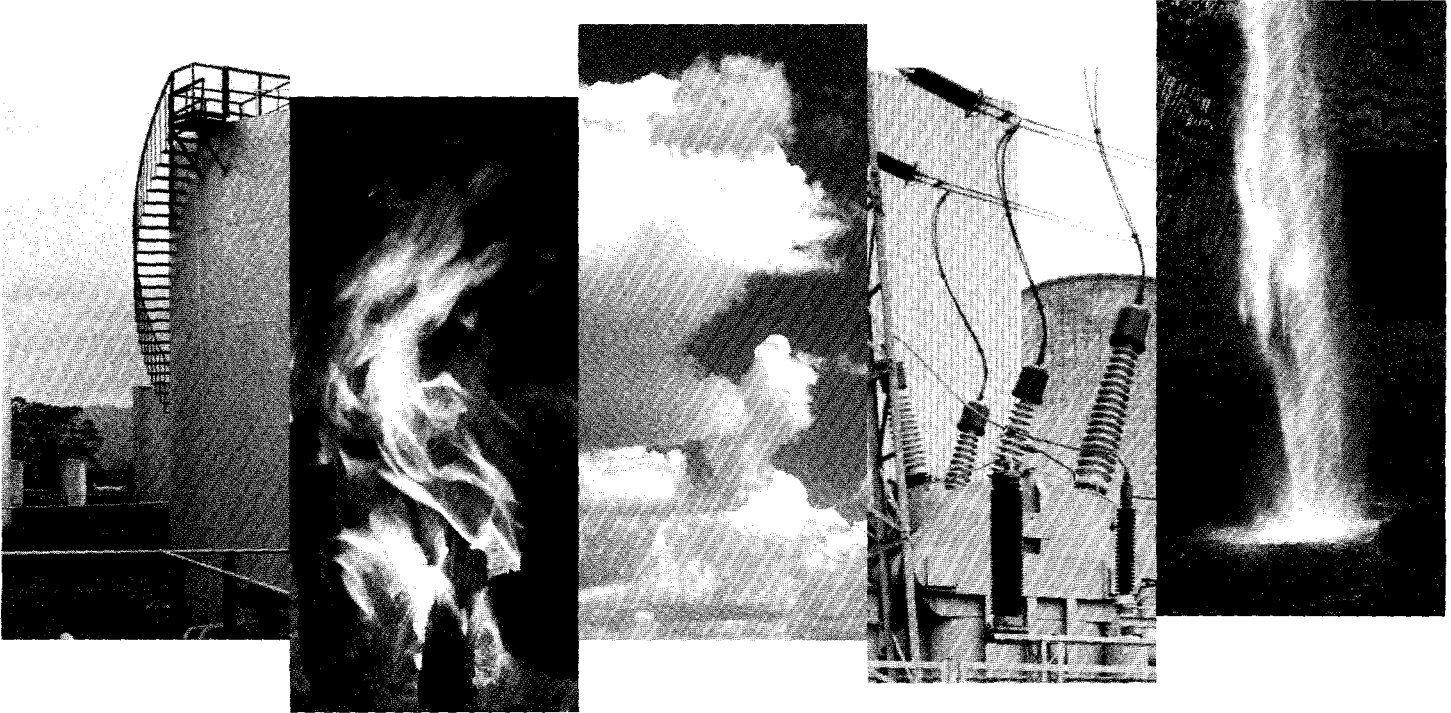
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