



Workshop Working Paper  
**Petroleum Master Planning**

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## Petroleum Master Planning

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### **Introduction**

Planning for the best utilization of a country's non-renewable natural resources is a challenging activity that requires of governments a serious commitment across a broad range of activities:

- Developing an understanding of nature, potential cost and time frame of extracting the resources;
- Recognizing the value of the resources in international and domestic markets and how these values are formed and may change;
- Coordinating policies and regulations across a number of different ministries and departments in the government to promote the resource development in a manner that benefits the nation;
- Providing incentives to public and private sector enterprises to make the required investments; and
- Bringing together various stakeholders in order to foster societal support for extracting and utilizing the resources for the country's development.

Petroleum resource extraction and utilization has a long history across the globe, with both positive and negative impacts on governments, environment, and society. Therefore, when a country discovers large petroleum resources, it needs to plan appropriately in order to follow a path that enhances the development of the entire country.

A Petroleum Master Plan (PMP) is developed in order to guide the strategic planning for the petroleum sector in a country. This article presents an overview of the principles behind petroleum master planning, and describes the key components of a master plan. The article is intended to be general enough for any country or region to initiate and go through the master planning process in order to strategize around the required policies and regulations for the petroleum sector.

The article is divided into three major sections: a) an overview of a PMP, b) elements of a PMP, and c) approach for decision making and development of recommendations and action plans. The article is intended to provide guidance to policy makers, and as such is written in the context of best practices related to the development of a PMP. While the development of any specific PMP for a country or a region is "path-dependent", i.e., it has to be based on legal, economic, and historical development specific to the country, the content of this article can be considered as general rules or guidelines for the development of a PMP.

### **Overview of PMP**

Developing countries that have abundant oil and natural gas resources, typically lack the technical and financial capacities to develop these resources. They have often have a small indigenous market and infrastructure to use the petroleum or natural gas internally.

Hydrocarbon discoveries in these countries are usually made by international oil companies (IOCs) operating under exploration and production concession contracts with the governments. Due to the lack of a mature and large local petroleum market in these countries, IOCs aim to develop the oil and natural gas primarily for export or for use at large industrial facilities producing exportable products. The governments of developing countries, while receiving royalties and profit sharing from the IOCs, often view these resources as a way to promote greater economic development in their country. The increased economic development is based on the production of oil and gas, development of the associated infrastructure and by making domestically-produced gas, oil-products, or other derivatives (products produced from the oil and gas) available to their citizens, often below global or regional market prices.

It is also important to recognize that revenues from oil and gas development are also sometimes siphoned off to benefit a few, rather than the entire country. So while finding and developing oil and gas resources can lead to broader economic development, they can also become a source of discord and even conflict.

It is in this context that international development organizations, such as the World Bank, have encouraged countries to produce PMPs<sup>1</sup> to guide public policy and investment to enable the widespread use of oil and gas and promote economic development. A PMP becomes an important policy document for a country to set out its vision, objectives, strategic plans, policies, and implementation action plans for petroleum sector development. In general, the PMP should serve as a roadmap for development of oil and gas production, transportation of oil and gas within and outside the country (e.g., crude oil exports or LNG exports), and use of oil and gas in various domestic markets in a country.

Table 1 provides sampling of PMPs that have been developed recently.

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<sup>1</sup> PMPs in some countries are referred to as Gas Master Plans (GMP). In this document we use PMP to refer to both.

Table 1. Sample of Recent Petroleum Master Plans

Country	Title	Date	Access
Albania	Gas Master Plan	In progress	<a href="http://www.balkaneu.com/albania-starts-prepare-gas-master-plan/">http://www.balkaneu.com/albania-starts-prepare-gas-master-plan/</a>
Trinidad & Tobago	Gas Master Plan	In progress	Not available
Kenya	Towards a Petroleum Sector Master Plan for Kenya	2015	<a href="http://ices.or.ke/petroleum-sector-master-plan/">http://ices.or.ke/petroleum-sector-master-plan/</a>
Mozambique	The Future of Gas in Mozambique: Towards a Gas Master Plan	2013	<a href="http://www.inp.gov.mz/content/download/716/4188/file">http://www.inp.gov.mz/content/download/716/4188/file</a>
Southern Africa Development Community Secretariat	Regional Infrastructure Development Master Plan, Energy Sector Plan	2012	<a href="http://www.sadc.int/files/5413/5293/3528/Regional_Infrastructure_Development_Master_Plan_Energy_Sector_Plan.pdf">http://www.sadc.int/files/5413/5293/3528/Regional_Infrastructure_Development_Master_Plan_Energy_Sector_Plan.pdf</a>
Philippines	Natural Gas Master Plan, Phase 1 and Phase 2 Reports	2014/14	<a href="https://www.doe.gov.ph/microsites/ngmd%20website/First-Report-NaturalGasMasterPlan.pdf">https://www.doe.gov.ph/microsites/ngmd%20website/First-Report-NaturalGasMasterPlan.pdf</a> and <a href="https://www.doe.gov.ph/microsites/ngmd%20website/wb_phase2.pdf">https://www.doe.gov.ph/microsites/ngmd%20website/wb_phase2.pdf</a>
Viet Nam	Master Plan for Gas Development in Viet Nam	2007	<a href="http://documents.worldbank.org/curated/en/2007/06/16362615/vietnam-review-gas-master-plan-workshop-version-report-review-master-plan-gas-development-southern-vietnam">http://documents.worldbank.org/curated/en/2007/06/16362615/vietnam-review-gas-master-plan-workshop-version-report-review-master-plan-gas-development-southern-vietnam</a>
Ghana	Energy Sector Strategy and Development Plan	2010	<a href="http://ghanaoilwatch.org/images/laws/energy_strategy.pdf">http://ghanaoilwatch.org/images/laws/energy_strategy.pdf</a>
Nigeria	Gas Master Plan	2008	<a href="http://resourcedat.com/document/nnpc-nigerian-gas-master-plan/">http://resourcedat.com/document/nnpc-nigerian-gas-master-plan/</a>

The essential characteristics of a PMP are that:

- It is forward looking, taking a long view of development of natural gas supply, demand, and infrastructure, typically over a 20 to 30 year time horizon;
- It should be a consensus-driven document, laying out a vision for the development of the sector;
- It considers both technical and economic issues of resource development under various scenarios;
- It evaluates export drivers and domestic demand growth under alternative development scenarios;
- It reviews the infrastructure needed to meet the supply requirements for export or import facilities, as the case may be, and domestic consumption of oil and gas;
- It reviews and recommends legal and regulatory arrangements and proposes institutional structures that are necessary for supporting oil and gas development; and
- It should continually evolve and be updated as more information is obtained over time.

As a strategic policy document, the PMP needs to consider the options for the future development of the oil and gas sector, and place its development in the context of the broader economic development of the country. The PMP needs to consider the long term vision for the country, even though much of the policy interest may be in the near term recommendations and options.

To be useful as a policy guide, a PMP must be a consensus-driven guidance, laying out a vision for the development of the resource and the domestic economy, addressing the concerns of civil society and broader economic development objectives of the government. It should at least be aware of issues of equity, and social and environmental effects.

The PMP must be based on a solid foundation of technical analyses, including the supply and demand for oil and gas, as well as the products that oil and gas will be used in. Details on these technical studies will be discussed in later sections. Scenario analysis is particularly important as the PMP is expected to address long term issues and a number of different development alternatives. The PMP will need to consider how infrastructure development for oil and gas production and delivery within the country will occur over time. This is particularly important as how such development will take place will influence the level of investment that is needed in the sector.

Other factors that have to be taken into account in a PMP are the legislative, policy, and institutional arrangements needed to properly regulate and oversee petroleum development. In most cases, local institutions are inadequate in these developing countries, so a PMP can incorporate a gap analysis that identifies the needs of the larger polity in developing the hydrocarbon resources for the benefit of the country.

A PMP is almost always developed in a state of incomplete information, with many of the public institutions and policies being either non-existent, weak, or under development. Thus, the PMP must outline a staged process of information and institutional development and capacity building. There are decisions that the government will need to make over time to implement a PMP and these should be laid out as clearly as possible in the PMP.

The PMP should also identify potential “decision-trees” that are dependent on additional information that may be gathered and analyses conducted in time. The PMP should also develop a plan for obtaining additional information that is necessary for fine-tuning or for making key decisions. Thus, the PMP provides a vision and a plan anchored in a specific knowledge base and as such as knowledge improves the PMP will be revisited and updated to reflect changes in the situation.

#### The PMP Process

How a PMP is developed is as important as *what* the PMP contains. If done correctly, undertaking the PMP itself can be beneficial to the government.

Prior to undertaking the PMP process, it is important for government to review and assess the reasons for developing the PMP. Extensive consultations with existing ministries and departments and local, regional, and private sector stakeholders may be necessary to obtain buy-in to engage in the PMP process in the first place.

As noted earlier, countries are often encouraged by international development organizations, such as the World Bank, to develop a PMP in order to guide policy and investment in the country’s oil and gas sector. In some cases, having such a plan can help a country to develop a unified vision that avoids conflicts among stakeholders. Oil and gas development has led to discord in a number of countries (e.g., Nigeria, Bolivia, and Indonesia).<sup>2</sup> However, a PMP process can provide an opportunity for stakeholders to engage among each other to develop a transparent and consensus-based policies for a just and equitable sharing of the benefits from oil and gas development. The PMP process can help the government to lay out a path through the complexities of international oil and gas markets, as well as build up internal institutional capacity, technical analyses, and approaches for timely decision making.

The PMP development process involves a coordinated initiative by the sponsoring government, typically led by an energy or resource ministry. International organizations, such as the World Bank, IFC, or regional development banks, may also provide both technical and financial assistance for the process. Usually, independent experts and consultants with expertise in the petroleum sector are hired to undertake the necessary technical analysis to develop the PMP. The consultants often work under the guidance of a “steering committee” made up of government representatives from the various relevant ministries, with a chairperson who is selected from the sponsoring ministry. The work products of the consultants are reviewed by the committee and the international organization case officer, if an international organization is providing support for the PMP analysis and development.

Development of the PMP requires consensus across the various government ministries, as well as amongst other stakeholders. There are three main sets of stakeholders who would be engaged in and benefit from the PMP:

- **Investors**, for whom a PMP provides clarity of purpose that future policies and regulations will provide the conditions for a viable investment in the country.
- **Local populations**, for whom the PMP lays out how the Government plans to use its

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<sup>2</sup> <http://www.fess-global.org/files/OilandGas.pdf>

<https://www.globalpolicy.org/the-dark-side-of-natural-resources-st/oil-and-natural-gas-in-conflict.html>

revenues from oil and gas for economic development throughout the country. At the same time, the Master Plan must help manage expectations from the local populations on the timescale and benefits from oil and gas development.

- **Government institutions and regional governments**, for whom a PMP provides situational awareness and lays out the institutional framework that will be used in developing consensus for new policies and regulations.

As such, extensive interviews are to be conducted across the government, industry, and other interested parties. Interviews are summarized and included in an “Inception Report”. The Inception Report is a very rough first draft of the PMP – one that lays out the structure of the potential PMP, key issues identified through the interviews, areas where additional information or analyses is required, and future steps and schedules. The Inception Report sets the expectations for what a PMP in country can look like.

Based on the various technical analyses that are conducted independently by the technical experts, as well as in collaboration with the government agencies, a draft PMP will be prepared for circulation among reviewers and stakeholders. This draft PMP will need to be circulated to stakeholders within the government, as well as to the outside stakeholders, and it can form the basis for public stakeholder conferences. At these conferences, the government and the consultants will present findings to the public. Such public engagement is critical for the success of a PMP and for getting buy-in amongst all stakeholders for its eventual implementation. After the stakeholder conferences and changes made to the draft document, a final PMP is issued, which also may be presented in a stakeholder conference. The PMP then passes into the hands of the policy makers and government agencies who will begin the implementation process through its official processes.

## **PMP Content**

There are a number of technical studies will need to be completed as part of the PMP. As noted earlier, in many developing countries whose oil and gas sector is at nascent stage, the level of technical knowledge within the country may be limited. As such, international experts are engaged to provide advisory support in key areas:

- Oil and gas commercial and technical expertise
- Financial and fiscal advisory
- Negotiations support
- Economic development
- Institutional capacity building in legal framework, energy development, regulation of the industry (environmental, health and safety, economic)

In this section, the specific contents of the technical studies and the overall contents of the PMP are described further. The substantive technical contents of a PMP include the following items:

- **PMP vision and objectives:** A concise statement of the specific objectives of the PMP. This may include a “vision statement” which may set out the purposes of the government in developing a PMP. The vision must be relatively short and succinct, and explain the “what” and “why” of the PMP. It must be consistent with current objectives of the Government, and be a guiding principle for the future petroleum

sector that the country intends to have. At the same time, elements of the vision should lead to specific actions/activities for the Master Plan. The vision should be based on sufficient consultation across the government ministries agencies, as well as with other stakeholders on the vision. Finally, the vision should lead to specific objectives for the Master Plan development. It can highlight specific focus areas for the PMP technical analysis and expected outcomes from the PMP.

As an example, the vision statement from the Mozambique Gas Master Plan is replicated below:

*Develop natural gas resources in a way that maximizes benefits to Mozambique society by supporting:*

- *growth in domestic public and private sector institutional competencies;*
- *growth in domestic industry and businesses, especially small and medium scale industries;*
- *increased employment across the country, especially in the less-developed provinces;*
- *infrastructure to support expanded economic activities, especially in less-developed provinces; and*
- *expanded access to training and education*

*in order to improve the quality of life for the people of Mozambique, while minimizing adverse social and environmental impacts.*

This vision from the Mozambique Gas Master Plan highlights various goals and concerns of different parts of the Mozambique government, as well as other stakeholders. This vision was presented to stakeholder groups to build consensus on the long term vision. The vision lead to specific technical analysis. For example, the emphasis on increased employment from the gas sector in Mozambique led to a detailed analysis of employment gains due to various gas development scenarios.

- **Contextual Background:** A background section reviews the current situation regarding energy development in the country, state of the domestic energy market, energy consumption by type, sources of hydrocarbons, pricing, the key companies and institutions and notes other planning documents or initiatives that can bear on the PMP. This review of the economic baseline of country will need to be focused on metrics such as energy use by sector (power, industry, commercial, transportation, and domestic uses), GDP, employment, education and other socioeconomic factors identified by stakeholders as important for planning. The background also needs to consider the specific socio-political aspects associated with oil and gas development as well. For example, in Somalia, the challenge of oil and gas development is affected by the past and potential future conflict between regions and national government. In Mozambique, the lack of economic development in the northern part of the country (where large quantities of gas was discovered) led to a focus on using the gas development for broader economic development in the northern parts.
- **Resource Supply Assessment:** A hydrocarbon supply assessment and forecast over a specified period (10 to 20 years, for example) is a basic step in the analysis. If exploration has already occurred, then the technical team can work with Government



energy/gas ministry, exploration companies, and other relevant government agencies to compile and evaluate available geologic and engineering data on discovered and undiscovered oil and gas resources in the country. Based on the geologic data, estimates and uncertainty ranges for the oil and gas resource base and technically recoverable oil and natural gas can be developed. The resource base along with exploration and production (E&P) costs, processing and transportation issues will be useful for identifying how oil and gas can be produced using current technology and the prevailing economics for oil and gas production. As necessary, oil and gas supply curves for the cost of production can be produced to show the amount of oil and gas that can be developed in specific basins and at what cost. These supply curves should also take into potential royalty and tax regimes in order to assess cost of production.

- **Resource Demand Forecast:** The demand for the oil and gas produced in a country will be based on two main categories: global/regional demand for the oil and/or gas, and domestic (in-country) demand for oil and gas. It is important to consider both the global/regional and domestic demand forecasts because in many cases, the domestic demand for oil and gas may be limited due to lack of a market to use locally produced oil and gas.

Furthermore, there are key differences between how oil and gas are typically used in a country. In case of crude oil production, the sale of the crude to refineries across the globe is relatively straightforward. Even small amounts of oil can be exported to the world market under prevailing world oil prices. The barriers to exports are small. Therefore, production of oil is primarily dependent on expectations of world oil prices in the future. If there are no existing refineries in the country, the potential for building a new refinery for the produced crude oil is dependent on the size of expected production and the economics of the production. In general, it is unlikely that a new refinery will be built in the near term. Hence, oil production will likely be more focused on global or regional oil markets in the short-to-medium term. Furthermore, domestic consumption of oil products (gasoline, diesel, and fuel oil) will generally be based on world prices for these products, barring any specific subsidies that reduce domestic prices for the oil products relative to international prices plus transport costs.

For natural gas, there are two main types of demand: demand for gas export through liquefied natural gas (LNG) and demand for gas in domestic markets. LNG exports is very expensive, although it does tend to have favorable economics if oil-to-gas price ratios are high enough. In general, LNG economics is favorable if there are relatively high oil prices combined with low gas production costs. Domestic gas consumption is dependent on development of gas infrastructure to supply the gas to large industrial facilities or power plants. These so called "megaprojects" are potentially attractive for providing anchor loads for gas that in turn can support pipeline infrastructure buildout, which then provides a foundation for wider access to gas supply. The megaprojects also can support employment in the country initially, although their direct employment tends to be small and front loaded during the construction phase.

In many developing countries, there is no or very little indigenous gas use; and therefore forecasting future uses of gas in small and medium enterprises (SME), commercial

establishments, transportation, and domestic uses is very difficult. Furthermore, domestic consumption is highly contingent on government policies with respect to economic development, access to energy, pricing, business, and socioeconomic policies. For example, policies around business formation (permitting, taxes, etc.) may inhibit the development of SMEs, which are more likely to sustain employment derived from greater access to power or gas than the large megaprojects.

Power demand is often the most critical market for natural gas, and it also the most sensitive sector to gas prices. Gas demand in the power sector can be estimated from existing power planning scenarios or through additional analysis with the Government to develop demand scenarios using a power sector model for the quantitative assessment of demand-supply balance in the power sector. Often however, there is little information or budget to undertake a full power system assessment, unless that is a major focus of the PMP.

- **Petroleum and Economic Development:** A principal objective of a PMP for most countries is to identify how the hydrocarbon resource production can promote economic development in country. To this end the technical analysis will need to include the development of a framework to evaluate alternative industrial development schemes and proposals to estimate the economic impact in terms of contribution to GDP, employment, and government revenues.

As an example, for the Mozambique Gas Master Plan, an economic model was developed to estimate the value of potential infrastructure and gas development. This model was transferred to the government and Mozambique staff were trained on its use. The objective was to provide a tool for assessing the proposals made by the various sponsors of megaprojects for gas utilization, and for estimating infrastructure needs and costs that are necessary for planning purposes.

- **Infrastructure Assessment:** Infrastructure requirements and costs as well as ownership is a major issue in the PMP. Infrastructure needs are dependent on whether the hydrocarbon resource is oil, gas or both, and whether the production is onshore or offshore. For offshore oil production, export of crude oil is relatively easy, as the crude can be exported after some initial processing. Onshore oil production can be transported by trucks to a port for export to refineries. Therefore, the need for new infrastructure development to support crude oil export is relatively small.

For exporting natural gas that is produced offshore, a country will have to decide whether or not the gas will be brought onshore for processing or liquefaction. Bringing the gas onshore would involve additional infrastructure costs; however, there are benefits in terms of employment and economic development that results from such an activity. Furthermore, any gas that is brought onshore can potentially be used for domestic use (in power plants and other industries). If gas is produced onshore, then the produced gas will need to be transported to industrial centers via pipelines. Thus, there is much more infrastructure needs associated with natural gas development.

The technical analysis for the PMP will need to assess the configuration, investment, operating costs of processing, transmission and distribution facilities for the oil and gas

that is likely to be produced. The analysis can also develop different scenarios for the infrastructure development roadmap, depending on the specific needs. These scenarios can be used as inputs to the development of the PMP.

- **Socioeconomic and Environmental Issues:** The PMP must address socioeconomic and environmental issues associated with development of the oil and gas sector. Employment is a major concern of governments, but increasing employment in the oil and gas sector is challenging in developing countries where there is little skilled labor to construct and operate sophisticated energy facilities. On the other hand, governments are often concerned about how to develop a skilled labor pool through energy development. Educational and training also will be necessary to provide an adequate workforce. A PMP may address these issues in more or less detail depending on the need of the government. Displacement of populations due to oil and gas production is another major issue that needs to be addressed by the PMP. Other socioeconomic infrastructure concerns include the capacity of existing transportation networks – roads, airports, and port facilities – to support oil and gas development and subsequent transportation of the produced oil or gas. Extending the electrical system to support the new development is another issue.

Of equal importance are the expected environmental effects of oil and gas development. This is especially the case where there are large off-shore facilities in need of staging areas, supply bases, and large on-shore facilities like pipelines, LNG terminals, processing facilities and the like. Oil transport via pipelines, in particular, requires sufficient environmental regulations to ensure that there are no safety or environmental issues in case of leakages.

Environmental degradation has a major impact on local populations, as well as on other economic activities like tourism, farming, fishing and other resource based activities. Therefore, it is important to consider potential environmental impacts of oil and gas production. The PMP normally incorporates some assessment of the environmental impacts of the development options, but necessarily at a high level since the configuration of facilities is not certain.

- **Institutions and Governance:** The analysis of institutional arrangements and governance is another important element of a PMP: namely to address the issues related to gas market design, legal and regulatory structures, financial capabilities, and government policy perspectives on gas, energy, and development. Entities sponsoring PMPs like to know how other countries have dealt with similar issues and what lessons can be learned from them (successful and not successful).

Market design (i.e., how gas prices or energy prices in general are formed), ownership of facilities, and the underlying contract law and other legal and regulatory frameworks operate to encourage or discourage gas use and economic development should be addressed in the PMP. This can be a sensitive public policy issue, as it is dependent on specific ideology of a government. As an example, the question whether the royalties from gas development be take in cash or in kind depends ultimately on how the resources will be used, and whether there is a level of trust between the government and the populace on how oil and gas development will be used for the benefit of the country. Transparency and a sensitivity to civil society concerns about corruption needs to be addressed as well—

another sensitive issue.

- **Financial and Fiscal Analysis:** An analysis of the financial needs for oil and gas development, including its associated infrastructure development, and the analysis of fiscal matters (i.e., impacts of the revenues and investments in the oil and gas sector) is another important issue. The PMP needs to provide estimates of revenue forecasts from resource development. This requires some understanding of the underlying concession agreements. In our experience, there is considerable ambiguity in these documents that create opportunities for different interpretations and disappointments.

A major issue is oil and gas pricing, particularly for the domestic market. It is expected that the resource developers, aiming for international export markets will receive market prices as price takers. For natural gas, this implies a value of gas at the wellhead and at the intake to the LNG export plant that is a “net-back” from the market price – i.e., the value in the market less all the costs of getting it to market. On the one hand, the government would like to see this value to be high given it establishes the royalty payments from the developers and the governments profit share. It is likely however to be a value that is higher than the local markets could tolerate. Thus, the government must decide whether to take royalties in cash or in kind. If the latter, then the government gives up a potential large revenue stream (which could be used for other worthy social purposes). Therefore, the PMP must lay out the costs and benefits of these choices.

Some concession agreements require some local gas use outside the royalties and profits. Nevertheless the government can decide whether even this gas would be more beneficial to the country by selling it in the world market or making it available for domestic uses. Similar pricing issues arise for oil production as well, although how petroleum products are priced in the domestic market is dependent on whether there are domestic refineries or not.

In sum, the technical analysis for the PMP needs to be an objective assessment of the current situation and provide scenario-based prospects for the future of the oil and gas development in the country. It should lay out what is known and what needs to develop a list of items for further study.

### **Decision Making and the PMP Roadmap**

A principal goal of the PMP is to present a proposed course of action needed to implement the vision, consistent with the facts developed in the PMP. Thus the PMP should lay out a number of decisions and recommendations that the government should address. Ultimately, the government will take these recommendations and implement them through legislation or a policy statement directing certain actions that should be taken to implement a PMP. This government document is the vehicle that actualizes the PMP.

There is a natural hierarchy of decisions that arise out of the PMP recommendations. These decisions relate to matters that must be settled at different timeframes to allow development to proceed, or to finalize terms for additional studies. The hierarchy arises from the fact that while many things must be decided, some are urgent and decisions needs to be taken in the short term. While many decisions are dependent on other decisions or

they need to be taken after additional studies in the longer term, they are still important. We have identified three levels of decisions:

- Critical Decisions: These are the decisions that must be taken immediately to further the development of the petroleum sector. This may include finalizing hydrocarbon legislation; revenue sharing arrangements with regional governments; concluding negotiations with the concessionaires; etc. Also included in this category is the need to identify additional priority studies and secure resources to undertake them and to ensure that these studies are oriented towards future decision making.
- Important Decisions: These are decisions in the short-term that are needed to lay the groundwork for the future development. This can include decisions on matters like legal reform, regulatory institutional capacity building, and similar reforms that would benefit from additional time and study.
- Other Decisions: Some decisions will have to be taken in time (several months to years) to support economic development in time. They are often dependent on other activities/decisions to be in place. These could include ensuring ongoing coordination between ministries over resource development, training programs, streamlining regulations over SMEs as examples.

Recommendations for action based on the conducted technical analysis can be broader than the decision hierarchy by itself. They may cover the appropriate role and relationships between government, state-owned enterprises, and the private sector. There will be recommendations on revenue and fiscal policies. In general, the recommendations should be aimed at specific actions and decisions that the government can take in time, based on the local social and institutional context, best practices, and lessons learned as identified in other countries.

It is advisable to lay out the advantages and disadvantages for each of the recommendations and to explain their significance. Recommendations must include a list of additional studies to further enhance the government's understanding and decision making over time. A mechanism for monitoring the progress should also be included.

Managing public expectations should be a major element of the PMP decision hierarchy and roadmap. Often the local populace perceives major resource discoveries and their development as a source of immediate wealth and riches. Such unrealistic perceptions need to be addressed head on by the government agencies. Disappointments and unrest can arise with the slow pace of development and perceived unequal distribution of opportunities. There are many examples of the effects of the "resource curse," on economies and societies. Thus, a public education program, aligned with transparent and trustworthy planning is an important element in successful implantation of a PMP.

### **Conclusion**

A PMP can be an invaluable tool for the development of the oil and gas sector. The process of the PMP development itself should be considered an important aspect of bringing various stakeholders together on a common purpose. A focused vision statement in the PMP can help guide the development of the PMP. A number of major technical analysis provide the foundation for the development of the PMP. A key outcome of the PMP should be a decision hierarchy and a set of recommendations that need to be implemented to appropriately develop the oil and gas sector. The PMP should be considered a "Living

**Document” – it must guide government action at present, but it must evolve over time as conditions change and more information becomes available.**

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