



# **Energy reform and local content in Mexico**

## **Effects on the hydrocarbons sector**

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Ramón Espinasa**

**Inter-American  
Development Bank**

Energy Division

Infrastructure &  
Environment Sector

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## **A. Introduction: Mexican Energy Reform as opportunity for implementing local content policies and practices and productive corridors**

This study results from needing to have a more precise knowledge of the recently approved Energy Reform, and its secondary laws and regulations, and thus the opportunities that may arise for implementing policies and practices that affect the percentage of local content of acquisitions and contracting to be undertaken by the various entities and companies in the sector, as well as the real possibilities of stimulating development of productive corridors to ensure the emergence, growth and consolidation of industries, companies and businesses of various types which support the energy sector in Mexico, strengthen the economy and reduce social inequality and poverty.

This section briefly covers the background, the previous study by the Inter-American Development Bank (IDB) and Petróleos Mexicanos (Pemex) in 2009, the diagnosis and projection of the hydrocarbons sector, the Energy Reform, and the most important aspects of the secondary legislation on energy, published in *Diario Oficial de la Federación* (DOF) on August 11, 2014, together with some regulations and agreements that were released in October and November that year.

### ***a. Background***

Faced by the recent changes in the oil and gas industry worldwide, Mexico has not stood still; although in the last two decades proposals and reforms have been made, these have not been far-reaching enough; and the economic, social and environmental conditions, in addition to institutional policies, still require a set of initiatives adapted to technological changes, along with products and markets which drive the transition to new models, resulting in greater wellbeing, equity and sustainable development for all people, especially the most vulnerable.

In recent years the energy sector, particularly hydrocarbons, has undergone an unexpected transformation, and Mexico urgently required a revision of its laws and regulatory framework, as described by the President of the Mexican Institute for Competitiveness (2013).

The report cited shows that the myth of the end of the oil era has collapsed; and the new global abundance of resources has inverted the roles of supply and demand: if before it was the investors who competed for a very limited number of countries with hydrocarbon potential, today it is the countries that are competing for global talent, investment and access to technology. In a few years the United States will become the world's largest oil producer, overtaking Saudi Arabia

and Russia in terms of gas production. Consequently, Mexico now has to deal with a new global energy order by opening to new policies so that it can compete or survive in these new conditions Council of the Mexican Institute for Competitiveness (2013):

"For the first time in a long time, there is a consensus on the urgency of reform, this time for real, of the hydrocarbons sector. All the diagnoses agree on the essentials. Certainly there are important differences on the content of the reform. But virtually no serious voice is saying today that the Mexican model is sound and sustainable."

This paper echoes respected studies on world hydrocarbons production in the near future, presents the risks that can be incurred by the current lack of action on policies in the sector, policies that contrast with the changes put through in other countries. The report was an important call for implementing the policy changes contained in the Energy Reform.

#### ***b. IDB-Pemex Study in 2009*<sup>1</sup>**

In 2009 the IDB and Pemex agreed to conduct a study ordered by congressional mandate to increase national procurement, which was reflected in the *Petróleos Mexicanos Law of 2008*. The content of the study is divided into four parts, in addition to the introduction, and its results form the basis for development of this project.

The second part describes the relationship of the oil sector to the rest of the Mexican productive base, using information from the analysis of the Input-Output Matrix of Mexico, prepared by the National Institute of Statistics and Geography (INEGI). With this information, the main direct and indirect supply sectors of Pemex can be identified at macroeconomic level; the supply chains of goods and services can be identified; and the multipliers of productive spending in the oil sector on the national economy can be estimated.

The third part of the report makes an initial assessment of the supply situation of the current and potential suppliers of direct and indirect goods and services to Pemex. The diagnosis is based on an opinion survey whose initial universe was the list of Pemex suppliers, although it was open to all the companies.

The fourth part systematically presents specific recommendations to increase the national

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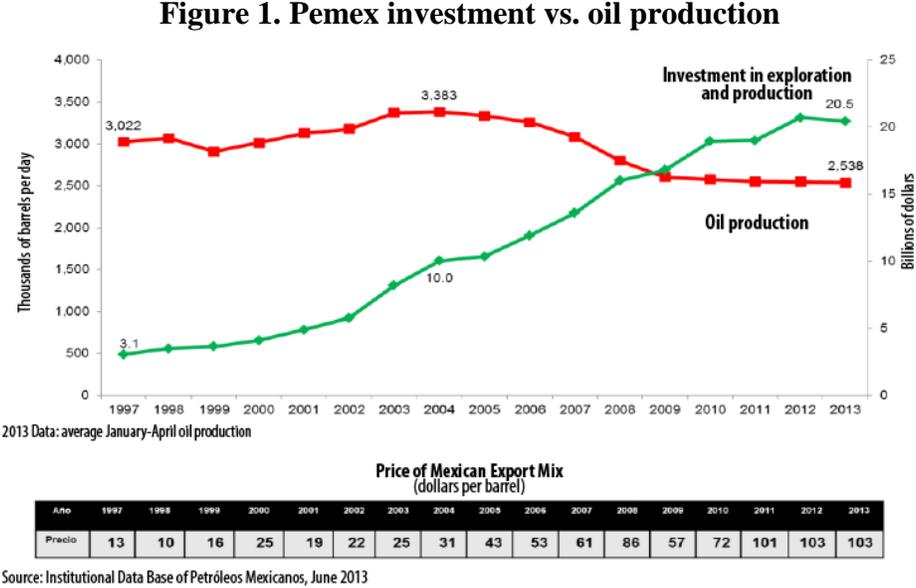
<sup>1</sup> This section is based on IDB (2009).

procurement of Pemex in the short term, based on the results of the survey and focus groups; while the fifth and final part describes the basic lines of what would be a medium-term plan to develop the national procurement of Pemex in the context of a longer-range industrial strategy, containing the diagnosis and prescription for development of supplier production chains in the sector.

**c. Diagnosis and projection of the hydrocarbons sector**

Like many other oil-rich countries, Mexico is heavily reliant on its energy wealth for its economic and social development. However, the Mexican oil sector is facing significant and urgent challenges, including falling production and the need for greater investment at industry level.

Despite investing more in oil exploration and production (E&P), production fell from 3,383,000 bpd in 2004 to 2,538,000 barrels per day in 2013 (Pemex, 2013), which has been insufficient.



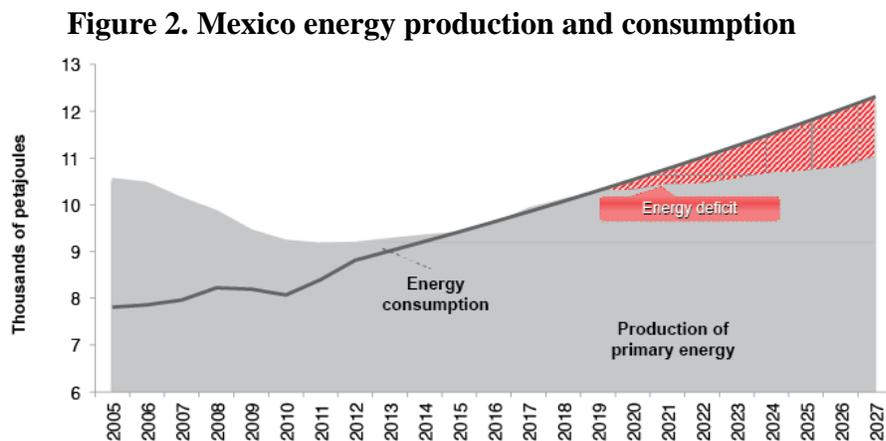
Source: Pemex (2013).

With respect to natural gas, in 1997 Mexico was virtually self-sufficient, importing only 3% of national consumption (SENER, n/d). At present 30% of the natural gas consumed in the country is imported.

The oil and natural gas of the future will come from so-called "unconventional resources," which are found in shale basins and in deep water. Although Mexico has large reserves of these resources, it lacks the technical, financial and execution capacity to produce them competitively.

The main obstacle to fully realizing our country's potential in this type of deposit was, until the Energy Reform, the constitutional framework, which required Pemex to undertake all the activities of the oil industry, irrespective of the financial, operational or technological restrictions to which the institution was subject.

The Ministry of Energy (SENER) has maintained in various forums on the Energy Reform the imminent need to increase hydrocarbons production and proven reserves, and to take action to change the trend, otherwise Mexico will experience an energy deficit, as shown in the following figures (see Figures 2 and 3).



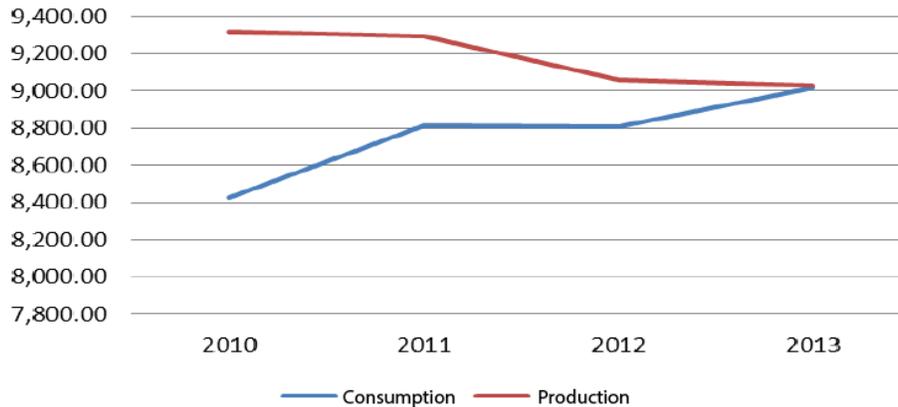
Source: Energy Information System, Ministry of Energy.

Source: SENER (n/d).

A more detailed analysis of the real data for national production and consumption over the last four years (2010-2013) clearly shows that the gap between the two concepts has been narrowing, reaching in 2013 the point at which the difference is practically zero (see Figure 3).

**Figure 3. Production vs. national consumption**

Petajoules (PJ)	2010	2011	2012	2013	2014
Consumption	8,426.54	8,812.49	8,809.36	9,017.37	N/D
Production	9,316.53	9,292.55	9,059.05	9,025.75	N/D
Difference	889.99	480.06	249.70	8.38	N/D



Source: SENER (n/d).

#### ***d. The Energy Reform***

To deal with the problems described, in December 2013 the Government of the Republic issued a Decree to amend Articles 27 and 28 of the Political Constitution of Mexico with respect to energy, in order to exploit energy resources in a rational and sustainable manner in line with the principles of national sovereignty, economic efficiency and social benefit (Government of the Republic, n/d).

The Energy Reform effectively changes the regulatory framework by allowing and promoting investment and modernization of the sector, giving Pemex and the productive State companies (EPE) the power to form joint ventures or partnerships and participate in E&P contracts with members of the public and private sectors. These changes are expected to cover the need to increase hydrocarbon production in Mexico.

It is worth noting that, in relation to E&P activities, the Law establishes a minimum percentage of national content which will gradually increase from 25% from 2015 to 35% in 2025; however, these percentages do not apply to projects from unconventional sources, such as production in deep water and gas, leaving in principle a void in the definition of potential suppliers, which could lead to scant participation by national companies. This could mean that the increase in production to meet national demand would be in the hands of foreign companies, which -

although in partnership with Pemex - represent for Pemex a high risk of technical and financial dependence. Given this situation, it is important to ensure that there are effective mechanisms in place for technology transfer to counteract possible dependence, to make room for development of national human capital and to ensure that the Ministry of Economy (SE) in accordance with SENER establishes the values for the percentage of national content, as stated in the Law.

For the rest of the activities of the value chain, which in the new law are not considered strategic, private participation is permitted, opening the market for opportunities to increase the national or local component and develop production chains.

There is also the expectation that the accumulation of projects stimulated by this new policy will increase oil revenues and generate new well-paid jobs and have a significant impact on the competitiveness of national companies. However, these effects can only be evaluated in the medium and long term.

It should also be noted that the real generation of oil income is a function of many variables, including: proper formulation of E&P contracts; trends in international prices; changes in supply and demand; and effectiveness implementation of federal government programs.

Finally, issues of great importance are transparency and the fight against corruption, which are addressed by the new legislation; although whether the negative effects of the decrease in investments due to fear or lack of security and transparency can really be counteracted depends on the effectiveness of its application.

### ***e. Secondary legislation***

On April 30, 2014 the Federal Executive submitted for consideration by the Senate secondary legislation initiatives on energy for approval. The initiatives, after completing the procedure for passing laws, were published in *Diario Oficial de la Federation* (DOF) on August 11, 2014 (secondary legislation). A summary of the initiatives and laws that resulted from this process is presented in Table 1.

**Table 1. Secondary legislation: nine initiatives which together include 21 laws**

	<b>Enacted</b>	<b>Provisions amended</b>
1	<ul style="list-style-type: none"><li>• Hydrocarbons Law</li></ul>	<ul style="list-style-type: none"><li>• Foreign Investment Law</li><li>• Mining Law</li><li>• Public-Private Partnerships Law</li></ul>
2	<ul style="list-style-type: none"><li>• Electricity Industry Law</li></ul>	
3	<ul style="list-style-type: none"><li>• Geothermal Energy Law</li></ul>	<ul style="list-style-type: none"><li>• National Water Law</li></ul>
4	<ul style="list-style-type: none"><li>• Law of the National Agency of Industrial Safety and Environmental Protection of the Hydrocarbons sector</li></ul>	
5	<ul style="list-style-type: none"><li>• Petróleos Mexicanos Law</li><li>• Federal Electricity Commission Law</li></ul>	<ul style="list-style-type: none"><li>• Para-state Entities Federal Law</li><li>• Law of Acquisitions, Leases and Public Sector Services</li><li>• Law on Public Works and Related-Services</li></ul>
6	<ul style="list-style-type: none"><li>• Coordinated Regulatory Bodies Law on Energy Law</li></ul>	<ul style="list-style-type: none"><li>• Federal Public Administration Organic Law</li></ul>
7	<ul style="list-style-type: none"><li>• Hydrocarbons Revenue Law</li></ul>	<ul style="list-style-type: none"><li>• Federal Duties Law</li><li>• Fiscal Coordination Law</li></ul>
8	<ul style="list-style-type: none"><li>• Law of the Mexican Petroleum Fund for Stabilization and Development</li></ul>	
9		<ul style="list-style-type: none"><li>• Budget and Fiscal Responsibility Federal Law</li><li>• General Public Debt Law</li></ul>

Source: SENER (2014).

The most important points of the secondary legislation in relation to the purpose of this study are given below.

### *f. Hydrocarbons Law*

The Law confirms that E&P activities are strategic but the private sector can participate through contracts, and releases the other activities from the rest of the segments of the industry. This opening to the participation of national and foreign private companies in the creation and development of businesses producing tangible and intangible assets also means their possible role in creating productive corridors associated with the hydrocarbons sector.

With respect to coverage of social aspects and development of the industry, the government, through SENER, will promote and oversee the timely supply of energy, for which the EPEs and the National Center for Control of Natural Gas (Cenegas) can be encouraged to develop projects all along the value chain, with the participation of private companies.

The Law also confirms that SENER and SE will promote the formation of local production chains and direct investment, especially among small and medium enterprises (SMEs), supported by a trust to promote development of suppliers and contractors in training, research and certification. They will also establish the methodology for measuring and verifying local content on assignments, contracts and permits.

### *g. Law of the Mexican Petroleum Fund for Stabilization and Development*

The Law creates the Mexican Petroleum Fund for Stabilization and Development (FMP), and determines the forms and items to which the resources derived from oil revenues have to be assigned, reopening scenarios of multiple opportunities for participation by private companies in procurement of goods and services.

In addition, the SE is responsible for defining, promoting and overseeing compliance with national content targets and development of productive corridors.

This excerpt from the secondary laws and associated regulations will determine their real vocation in relation to national component and creation of productive corridors.

## **B. Schematic summary of the hydrocarbons sector: policy, institutional structure and legal and regulatory framework, in the context of the Energy Reform of 2013**

Following approval of the Energy Reform and secondary laws, an institutional structure and a new legal and regulatory framework has been formed which it is important to describe and understand

in order to evaluate the real opportunities for achieving national component targets and developing productive corridors which have a positive impact on the economy and welfare of the Mexican population.

### *a. Summary of policies*

The policies that support the Energy Reform are contained in the laws, regulations, objectives, strategies and lines of action of the sector; in this context the most important for the purpose of this study are mentioned below.

Strategic activities (upstream, E&P) are differentiated in the regulations from other activities (downstream and midstream) in the subsector, which marks the policy of priority attention in the E&P segment.

There is a clear policy of opening of the oil sector. Unlike in the past, when most activities were restricted to Pemex, the sector is now open to participation by productive State enterprises (EPEs) and private national and foreign companies.

Laws and regulations are issued which define national component percentages in the contracts made by the sector, with the policy of promoting and ensuring the participation and benefit of national companies or which consume local resources and thus increase the economic spillover in the nation.

Planning and protection policies are promoted for future generations of Mexicans, expressed in the Mexican Petroleum Fund Law, which provides for the use and application of the resources generated by oil revenues, to different items and areas related to the social benefit in the short and long term.

To ensure that the resources of the Mexican Petroleum Fund are used for authorized purposes, the Law states that resources entering the Fund are considered federal resources and are subject to the oversight powers of the authorities.

The Hydrocarbons Law (Art. 125) also created the Advisory Council of the Energy Sector (SENER, 2014), headed by Ministry of Economy (SE) and representatives of the academic and business sectors, to support definition of policies, criteria and methodologies for diagnosis of the supply of regional and national products, goods and services; promotion of national industry; formation of regional and national production chains and development of human resource talent,

innovation and technology. This is a clear expression of a policy of promoting and supporting productive chains and national industry, the main objective of our study.

***b. Summary of the new structure of the sector and its main aspects***

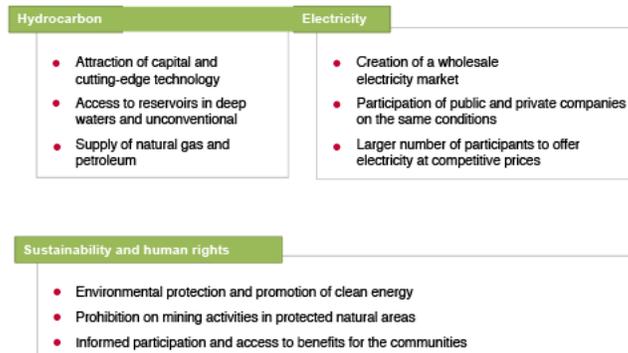
The Energy Reform expands in several directions; here the area of hydrocarbons is examined with the aim of covering three purposes: i) attracting capital and advanced technology, elements that constitute two weaknesses of the industry in the country; ii) access to deepwater and unconventional reservoirs which Pemex has not been able to exploit and which represent significant reserves of both oil and gas; and iii) supplying natural gas and petroleum to the various national markets covering their needs with quality, timely delivery and competitive price. This aspect is the main focus of this study, so the emphasis here is on the changes and opportunities arising in this area of activity.

The second aspect deals with the electricity sector, with the aim of: i) creating an electrical wholesale market to give entry to open competition in production and sales; ii) open the activities of the subsector to participation by public and private companies on equal conditions to encourage healthy competition; and finally iii) improve the country's competitiveness by offering electric power at reasonable prices.

The third aspect of the reforms has a cross-cutting sense, covering promotion of sustainability and respect for human rights in the implementation of all activities in the sector, by means of: i) environmental protection and promotion of use of clean energy; ii) caring for protected natural reserves, with prohibition of mining activities; and iii) respect and participation of the communities in which projects of the sector are implemented, keeping them informed and giving them access to the benefits generated.

## Figure 4. Aspects of energy reform

*With the Energy Reform, the most sweeping of the last eighty years, a new energy model comes into being.*



The aspects mentioned (shown in Figure 4) will be addressed by the new institutional structure, which will operate under the new legal and regulatory framework, described in more detail below, emphasizing issues of national content and development of productive corridors.

### *c. Schematic summary of the institutional structure and legal and regulatory framework*

The Energy Reform includes a renovated institutional structure in which the participating bodies already in existence broaden or change their powers; in addition there are also new entities.

Figure 5 shows the new institutional environment. This diagram is a visual guide for a more detailed explanation of each of the institutions in the new arrangement.

## Figure 5. New institutional environment

*Institutional arrangement is strengthened by creation of new entities and the strengthening of those already existing.*



#### ***d. Ministry of Energy (SENER)***

In the center of the diagram, heading the sector, SENER's mission<sup>2</sup> is to lead the country's energy policy, within the existing constitutional framework, to guarantee the competitive, sufficient, high quality, economically viable and environmentally sustainable energy required for development of national life.

SENER will coordinate<sup>3</sup> the energy sector and recommend policies conducive to increasing revenue and the energy security of the Nation.

The legal and regulatory framework for all the industry is briefly described in the introductory chapter of this study, in the box "Secondary legislation: nine initiatives which together include 21 laws." However, for the purpose of this chapter we will preferably refer to the articles of the Hydrocarbons Law which mention the concepts of interest to this study.

#### ***Legal and regulatory framework of SENER***

This Law (SENER, 2014) regulates the following activities in the country (Art 2, "General Provisions.")

- i. Surface prospecting and exploration, and hydrocarbon E&P;
- ii. Treatment, refining, sale, marketing, transportation and storage of oil;
- iii. Processing, compression, liquefaction, decompression and regasification, as well as transportation, storage, distribution, marketing and sale of natural gas to the public;
- iv. Transport, storage, distribution, marketing and sale of oil to the public, and
- v. Transport by pipeline and storage, linked to pipelines, of petrochemicals.

#### ***e. Regulatory bodies***

Strengthened and new regulatory bodies are as follows:

1. The National Hydrocarbons Commission<sup>4</sup> (CNH), an agency with authority and technical autonomy to regulate, supervise and evaluate E&P hydrocarbon activities.

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<sup>2</sup> See the SENER website at <http://www.sener.gob.mx/portal/Default.aspx?id=2624>

<sup>3</sup> See the SENER website at [http://sener.gob.mx/portal/Default\\_Intermedia.aspx?id=2676](http://sener.gob.mx/portal/Default_Intermedia.aspx?id=2676), Video de Beneficios

<sup>4</sup> See the CNH website, on its mission: [http://sener.gob.mx/portal/Default\\_Intermedia.aspx?id=2676](http://sener.gob.mx/portal/Default_Intermedia.aspx?id=2676).

2. The Energy Regulatory Commission <sup>5</sup> (CRE) which regulates industries of gas, refining, hydrocarbons products and electricity, promoting adequate coverage and overseeing reliability, quality and security of supply and provision of services at competitive prices.

3. The National Agency for Industrial Safety and Environmental Protection (ANSIPA), protects people, the environment and the facilities of the hydrocarbons sector (Chamber of Deputies of the Congress of the Union, 2014).

**Figure 6. Sustainability and respect for human rights**



### ***Legal and regulatory framework of the regulatory bodies***

The Law on Coordinated Regulatory Bodies for Energy is a regulation based on the eighth paragraph of Article 28 of the Political Constitution of Mexico, which regulates the organization and functioning of coordinated regulatory bodies in energy and establish their powers.

### ***f. Productive State enterprises<sup>6</sup>[6] (EPE)***

Pemex, its subsidiaries and the Federal Electricity Commission (CFE) are converted into Productive State Companies (EPE) with the following characteristics:

<sup>5</sup> See the mission of the CRE on its website at: <http://cre.gob.mx/articulo.aspx?id=11>.

<sup>6</sup> For more detail on this subject, see <http://energiaadebate.com/empresas-productivas-del-estado>.

- Their purpose is to create economic value and the increase the revenue of the Nation, with a sense of equity and social and environmental responsibility.
- They enjoy technical and managerial autonomy in line with best international practices.
- They have budgetary autonomy, with oversight of their liabilities and financing by the SHCP and Federal Executive.
- Their governing bodies have the power to determine their institutional arrangements.
- They have a special contracting regime appropriate for competing in their industry or activity.
- Each new EPE has a transition period stipulated by law.

### ***Legal and regulatory framework of EPEs***

Petróleos Mexicanos Law, Federal Electricity Commission Law, and the Para-state Entities Law.

### ***g. Agencies with new powers***

For the Ministry of Finance and Public Credit<sup>7</sup> (SHCP), there are new powers under the Hydrocarbons Law, related to the establishment of economic and fiscal conditions for bidding processes and contracts, in order to ensure income for long-term development; there are also new powers for oversight, audits and penalties with respect to contracts for E&P.

The SE<sup>8</sup> with the supplier development program and calculation of the national component will have to play an important role in efforts to achieve national component targets and develop productive corridors.

Figure 7 shows a scheme of legal mandates and their assignments mainly to the SE.

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<sup>7</sup> Hydrocarbons Law, Chapter II, Article 30.

<sup>8</sup> Hydrocarbons Law, Articles 46, 125, 127 and 128.

## Figure 7. Development of productive chains

*The Mexican state will promote development of regional and local productive chains*

### Instruments

- Preference for national goods, services and workers in equivalent conditions of price, quality and on-time delivery
- Strategy for industrial development of local productive chains
- Public Fund for Promotion of National Suppliers and Contracts of the Energy Industry.
- Special funds to guarantee universal electricity service and formation of human resources

### Examples of benefits

- Construction of Los Ramones gas pipeline, Phase II (Nuevo León to Guanajuato) will employ **6000 workers**.
- For each worker in the intermediate petrochemical industry **8 jobs** are created in the final production chain and **14 jobs** in manufacturing industry



Under the strategic leadership of the Mexican State, the energy sector will record the success of industrial policy in the automotive, aviation and electronic sectors.

### *Legal and regulatory framework of dependencies/units with new powers*

Hydrocarbons Law and Hydrocarbons Revenue Law. The Hydrocarbons Law and its following articles clearly express the mandates related to the purpose of our study, which are detailed below more precision and breadth.

- **Article 46.** The set of Hydrocarbons Exploration and Production activities undertaken in national territory through Exploration and Production Assignments and Contracts must have, on average, at least thirty-five percent national content.

This target excludes Hydrocarbon Exploration and Production in deep water and ultra-deep waters. The Ministry of Economy, on the opinion of the Ministry of Energy must set a national content target based on the characteristics of these activities.

The Ministry of Finance will establish the methodology for measuring national content in Assignments and Contracts for Exploration and Production and verify compliance [...].

To establish the methodology mentioned in the preceding paragraph, the SE uses, among other things, the following:

- i. Contracted goods and services, based on origin;
- ii. National manpower and skilled labor;
- iii. Training of national workforce;

- iv. Investment in local and regional physical infrastructure, and
- v. Technology transfer.
- **Article 125.-** The Ministry of Economy, with the opinion of the Ministry of Energy, defines strategies for the industrial development of local Production Chains and for promoting direct investment in the hydrocarbon industry, with particular attention to SMEs, as follows:
  - i. The strategy for the industrial development of local Productive Chains must:
    - a. Identify the sectors and regions on which the strategy will focus, aligned to demand from the hydrocarbon industry; to do this it can contract studies to identify existing products and services on the market, and the suppliers that offer them;
    - b. Integrate, manage and update a register of local suppliers for the hydrocarbons industry, which includes national companies interested in participating in the industry and their development needs;
    - c. Implement programs for developing national suppliers and contractors, starting with detection of business opportunities;
    - d. Promote the closing of gaps in technical capacity and quality of companies through support programs for technical and financial assistance, and
    - e. Form an advisory council, headed by the Ministry of Economy, with representatives of the Ministry of Energy, the National Hydrocarbons Commission, the Energy Regulatory Commission, academics and representatives from the private sector or industry [...].This council will help define policies, criteria and methodologies for diagnosis of supply of products, goods and services; promote national industry; create regional and national Productive Chains, and develop human resources talent, innovation and technology;

- ii. The strategy for promoting direct investment must:
  - a. Encourage direct participation by Mexican companies to carry out themselves activities in the hydrocarbons industry;
  - b. Promote partnerships between Mexican and foreign companies to carry out activities in the hydrocarbon industry;
  - c. Promote national and foreign investment to undertake permanent activities in Mexico directly in the hydrocarbon industry, or in the manufacture of goods or provision of services related to this industry, and
  - d. Promote transfer of technology and knowledge.

The Ministry of Economy is responsible for monitoring the progress of the strategies mentioned in this article [...]. To help comply with the provisions of this article, the Ministry of Economy will receive support from the Public Trust for Promoting the Development of National Suppliers and Contractors of the Energy Industry.

- **Article 27.-** The Public Trust for Promoting the Development of National Suppliers and Contractors of the Energy Industry will be created in a development banking institution. Its purpose is to promote the development and competitiveness of local and national suppliers and contractors, through financing schemes and support programs for training, research and certification, in order to close the gaps in technical capacity and quality, with particular attention to SMEs.
- **Article 128.-** The Ministry of Energy, the National Hydrocarbons Commission and the Energy Regulatory Commission, with the opinion of the Ministry of Economy, shall establish under the conditions included in the Assignments and Contracts for Exploration and Production, as well as in the permissions that this Law specifies that, under the same circumstances, including equal prices, quality and on-time delivery, preference shall be given to:
  - i. Acquisition of national goods, and
  - ii. Contracting of services of national origin, including training and hiring, at technical and management level, of persons of Mexican nationality.

- **Eight.-** To comply with the powers set out in this order, the Ministry of Economy will create a specialized unit which will be responsible for:
  - i. Follow up strategies for industrial development of local Production Chains and for promoting direct investment in the hydrocarbon industry and preparing and publishing the report on progress in their implementation;
  - ii. Propose the methodology for measuring national content in Exploration and Production Assignments and Contracts, as well as other activities referred to in Article 2 of this Law, and
  - iii. Verify compliance with the national content targets established in the Exploration and Production Assignments and Contracts.

#### ***h. Technical bodies to form markets***

These agencies are the National Energy Control Center (Cenace) - which has a network of centers nationwide and which has been operating for several years as part of CFE, but whose powers are extended in the new legislation, and the National Center for Control of Natural Gas (Cenegas).

Cenace<sup>9</sup> is responsible for dispatch of electric power and operation and control of the National Grid with quality and economic efficiency (Press Release, 2014), operation of the wholesale electricity market and guaranteeing open access to the national transmission and distribution grid, as well as making proposals to SENER for expanding and modernizing the grid.

According to the Hydrocarbons Law, Cenegas<sup>10</sup> is the independent manager and administrator of the National Integrated System of Natural Gas Transportation and Storage, with the aim of guaranteeing the continuity and security of provision of services in the system to contribute to the continuity of supply in national territory, and open access to the pipeline infrastructure, as well as proposing to SENER the planning and expansion of this system.

#### ***Legal and regulatory framework of the technical bodies***

Federal Electricity Commission Law, Coordinated Regulatory Bodies on Energy Law, and the Hydrocarbons Law.

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<sup>9</sup> See <http://www.conae.gob.mx/work/sites/CONAE/resources/LocalContent/2181/1/images/cenace.pdf>

<sup>10</sup> Hydrocarbons Law, Chapter III, Article 66.

***i. The Mexican Petroleum Fund<sup>11</sup> for Stabilization and Development (FMP)***

The FMP is responsible for receiving, managing and distributing all the oil revenues of the Nation. The Fund will ensure the stability of Mexican public finances and channeling resources for: long-term savings, a universal pension system, science and technology, infrastructure for national development and scholarships, among other allocations.

***Legal and regulatory framework of FMP***

Key parts of the Law of the Mexican Petroleum Fund for Stabilization and Development are cited below.

- **CHAPTER I: General Provisions**

**Article 1.** This is a public policy Law and its purpose is to establish the rules for the constitution and operation of the Mexican Petroleum Fund for Stabilization and Development, whose purpose is to receive, manage, invest and distribute income from the assignments and contracts referred to in the seventh paragraph of Article 27 of the Political Constitution of Mexico.

- **CHAPTER II: The Mexican Petroleum Fund and its Committee**

**Article 5.** The Mexican Petroleum Fund, public trust constituted by the Ministry of Finance and Public Credit, as trustor, in the Bank of Mexico, as trustee institution, is part of the Federation and shall not be considered para-state.

And finally the coordinating body for the sector.

***j. The Energy Sector Coordinating Council<sup>12</sup>***

The Council will make recommendations and approve coordination mechanisms to ensure compliance with the energy policy of Mexico.

The Mexican Petroleum Fund Law provides as follows:

- **Article 19.-** The Energy Sector Coordinating Council is created as a coordination mechanism between the Coordinated Regulatory Bodies on Energy, the Ministry of

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<sup>11</sup> Law of Mexican Petroleum Fund for Stabilization and Development.

<sup>12</sup> Regulatory Bodies Law coordinated on energy, Chapter VI, Article 19 and Chapter VII, Article 21.

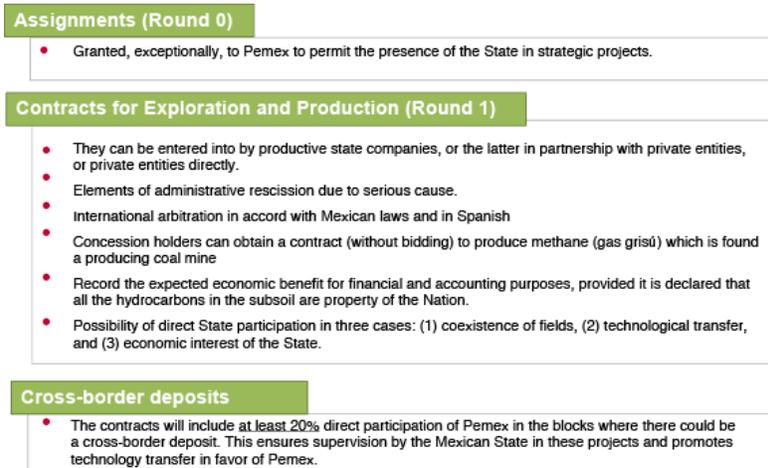
Energy and other agencies of the Federal Executive, in the terms of what their rules of operation establish.

- **Article 21.**- The Energy Sector Coordinating Council has, among other things, the following functions:
  - i. Make known to the Coordinated Regulatory Bodies on Energy the energy policy established by the Ministry of Energy;
  - ii. Issue, when appropriate, recommendations on aspects of energy policy and programs of the Federal Executive to be included in the annual work programs of the Coordinated Regulatory Bodies on Energy;
  - iii. Analyze, when appropriate, the recommendations and proposals of the Coordinated Regulatory Bodies on energy policy and programs of the Federal Executive;
  - iv. Establish the rules for its operation;
  - v. Implement information systems for sharing and institutional cooperation, and
  - vi. Analyze specific cases that may affect the development of the public policies of the Federal Executive on energy and propose coordination mechanisms.

Supplementary to the Institutional Structure and Legal and Regulatory Framework, this chapter includes the subject of assignments and contracts, known as Round 0 and Round 1, and a description of times with the main activities that must be covered.

The priority for Pemex in the assignment of E&P strategic projects through Round 0 is to ensure the participation of national State and private companies in this activity.

**Figure 8. Assignments and contracts**



### ***k. Next Steps***

In the stage known as Ronda 0 the participants were the National Hydrocarbons Commission (CNH) and Pemex. The latter has to evaluate its own capacity to participate, in order to optimize its profits now as a State production company. From the agreements of that initial stage came the determination of the spaces of participation available for potential private investors. The next Round 1 will specify which of these areas are likely to be granted in concession for E&P, and the types of these concessions and the characteristics of the respective bidding processes will be negotiated and agreed on. In addition to the CNH and the investors, Pemex will also participate to establish joint venture formulas with several of these companies with respect to deep water and heavy oil.

## **C. Local content and productive corridors in Mexico: specific policies and opportunities for sectorial integration**

The previous section described the institutional and regulatory framework created by the recent energy reform. This section analyzes the policies of promotion of local and national content, and the rules relating to that concept, in addition to those on development of productive corridors.

### ***a. Analysis of the policy of promoting local content***

Policies to promote local content are present in the institutional, legal and regulatory framework, as clarified by Minister of Economy Ildefonso Guajardo Villarreal: "The set of reforms go in a

single direction: how to create a level playing field, so that all economic agents have the opportunity to join in production processes and value chains.<sup>13</sup>

According to Guajardo Villareal, the concept of industrial policy must be understood as a policy to encourage development, expression which has to be seen in the context of an open economy, as sectors such as automotive, electronics and more recently aviation have done Mexico, including the opportunity to become development poles for oil states such as Campeche, Tabasco and Veracruz, promoting productive corridors.

Thus, under the energy reform, the Energy Ministry must define methodology for measuring national content in assignments and contracts, as well as verification of compliance.

As a result, the Ministry will have to use concepts proper to the activity, such as contracted goods and services, considering their origin, skilled and unskilled manpower, training of the national workforce, investment in local and regional physical infrastructure, and technology transfer.

For this, an agreement has been issued which establishes the methodology for measuring national content in assignments and contracts for hydrocarbon E&P, as well as the permissions in the hydrocarbon industry (SEGOB, 2014th).

Progress has been made on a series of procedures and lines of command for determining sequences, so the Ministry receives the mandate and develops the definitions, programs, projects and actions to implement it. For example, specific units have been defined with their functions:

- Government Purchasing Unit.
- Unit of National Content and Development of Productive Chains and Investment in the Energy Sector headed by a unit manager.
- Supported by General Directors of Development of Productive Chains and Investment in the Energy Sector, and of National Content in the Energy Sector.

Another aspect relates to the *Petróleos Mexicanos* Law, under Article 76, paragraph IX, the powers of the Board include requiring minimum percentages of national content, according to the nature of the contract and in accordance with international treaties signed by Mexico.

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<sup>13</sup> Speech by the Minister of Economy, Ildefonso Guajardo Villareal, in San Pedro Garza Garcia, Nuevo León, on November 19, 2014, "Energy and Competitiveness in Mexico Post Reforms."

Also in the Regulations of the Hydrocarbons Law, DOF: 31/10/2014 (SEGOB, 2014), Articles 14, 36, paragraph IV, 38 paragraph IV, establish the rules for including national content in the conditions, evaluation and contracting of bidding processes and projects, considering the coordinated participation of SENER and SE.

And finally, in the Regulations to the Hydrocarbons Law, Articles 94, 95 and 96, of Title V, refer to the subjects of "National Content and the Strategies for Industrial Development and Investment of the Hydrocarbon Industry" (SEGOB, 2014a).

***b. Inventory of rules on the concept of local content and productive corridors for the hydrocarbons sector***

The rules relating to the concept of local content are described in the official document "Rules for Determination, Accreditation and Verification of National Content of goods offered and delivered under the Contracting Procedures, and for implementation of National Content Requirement in Public Works, entered into by Agencies and Entities of the Federal Public Administration" (SEGOB, 2010).

These rules are intended to make known the provisions that the agencies and entities should observe for determining, accrediting and verifying the national content of the goods offered and delivered in procurement procedures, called and held in accordance with the Law of Public Sector Acquisitions, Leases and Services, as well as for application of the national content requirement in procurement procedures for public works, established in the Public Works and Related-Services Law.

***i. Cases and opportunities of national sectorial linkages***

Mexican industry has gone through several cycles, which has revealed the effectiveness and permanence of sectorial linkages. In Mexico there have been multiple cases of successful experiences of sectorial clusters; and with them the opportunities for developing sectorial linkages with the hydrocarbon industry have been present particularly in the sectors of construction and iron and steel production, in addition to the production sectors of pipelines, pumps, motors, valves and measuring instruments and services such as drilling equipment, well completion services, offshore installations and ships.

At present there are some cases of national industries and sectors that exemplify sectorial linkages, including:

- Mexico's automotive industry, which is a market of great importance for the country's development, generating 3.6% of Mexican gross domestic product (GDP), and a significant factor in the Mexican economy. The automakers decided to invest in Mexico because of its privileged geographical conditions, cheap labor, low operating costs and the North American Free Trade Agreement (NAFTA). This industry has levels of competitiveness and quality compared with those of China, India, South Korea and Brazil (see Wikipedia, 2012).
- The aerospace industry in Mexico: in 2006 the company Bombardier Aerospace began training the first generation of Mexican technicians and engineers. Since then, the aviation industry has become a strategic sector for national development because it attracts investments, generates jobs and stimulates technological development. There are currently more than 120 aerospace companies operating in 13 of the 32 states (Mexican Mission to the USA, 2007).

## *ii. WTO agreements and their effects*

All the free trade agreements, including the one signed by Mexico with the United States and Canada (Chapter 10), establish public sector purchases (articles 1003 National treatment and non-discrimination and 1009: Qualification of suppliers) (SICE, nd).

The prohibition of discriminatory acts in bidding processes and competitions clearly limits the national content rules as compulsory for competing by any supplier, whether national or foreign, since these could cause an international dispute if they were disqualified for not meeting the national content established in the conditions, considering that they were subject to discriminatory treatment.

Even if an exception is made for larger integrated projects, in which a percentage of national content can in fact be applied, there is enough ambiguity to prevent a consensus among lawyers specializing in the subject.

Local content policy is one of the acts prohibited in capital investment by the Agreement on Trade-Related Investment Measures (TRIMS). Usually, local content policy is associated with the granting of tax incentives for foreign companies.

This local content policy is considered to have violated Article III.4 of the World Trade Organization (WTO) on Non Discrimination in National Treatment).

### *c. Case studies of local content practices and productive corridors in the Mexican economy*

To examine case studies of local content practices, research was conducted through interviews with specialists in the subject, along with study and analysis of reference documents.

In the case studies in the energy sector, managers were interviewed who were responsible for supplier development and the national component of Pemex, after the 2008 energy reform<sup>14</sup>.

#### *i. The hydrocarbons sector*

In view of the 2008 energy reform and the request by the Chamber of Deputies to increase local content by 25%, Pemex developed a compliance strategy (Pemex, n/d).

This strategy involved application of a methodology based on the following phases:

- Define demand for goods and services of Pemex for the next five years.
- Define and classify national supply.
- Identify gaps between the two concepts, to generate appropriate actions to close them, improving existing and potential national suppliers of goods and services for Pemex.

The first phase of identifying demand required a great effort which finally took shape in the Pemex Demand Forecasting System of Goods and Services, which solved one side of the equation, which was comparison between demand and national supply.

After settling the issue of demand, efforts were directed at knowing and describing the supply side, a challenge that was very difficult to resolve with sufficient depth, despite the great stimulus from both public and private institutions.

Finally, in view of the real lack of detailed knowledge of the conditions of supply of the national industry of the hydrocarbons sector, the Pemex Unit of Supplier Development and National Content chose to work on projects focused on supplier development with the following characteristics:

1. In the first case, known as "Specific," a "tractor" company was selected with relative importance as a Pemex supplier, to diagnose the state of the companies that supplied

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<sup>14</sup> Cybele Díaz Wionczek, Deputy Director of Development Unit of Suppliers and National Content, 2010-2014.

- their goods and services, and based on the diagnostic of the current state of its supplier companies, a strategy was designed to bring them to a level of performance and competitiveness that was in line with the needs of international supply and demand.
2. The second project, known as "Sectorial," focused on selection of three sectors significant in Pemex procurement. With the participation of industry or sector chambers, the companies were evaluated as to which were or could be suppliers of Pemex and the aspects that needed improvement were determined.
  3. The third exercise for developing Pemex suppliers was known as "Regional," and specifically focused on Tabasco state. The project passed onto the state government and its scope was redefined, incorporating a comprehensive study about local supply in Tabasco.

The main lessons learned from these projects emphasize the importance of:

- The correct selection of the tractor companies, which as Pemex suppliers must have the capacity to mobilize their suppliers of goods and services to participate in the processes of evaluation, development and assessment, and whose impact should be highly significant.
- Selection of consulting firms to perform diagnostic and development activities, which must have the resources and expertise to ensure high quality results.
- Mechanisms to measure the development of the companies over time and speed up the learning process.

These three initiatives taken by Pemex between 2009 and 2013 in the energy sector are living examples of case studies in which the development of productive corridors or chains of companies related to the hydrocarbons sector is aimed at increasing national content.

### *iii. Other sectors*

Mexico has a good variety of cases of prosperous industries or sectors across the length and breadth of the Nation.

Thus, there are cases of sectors that have been developed under different conditions and circumstances, and constitute a sign of Mexico's world leadership, as reflected in the report "10 sectors where Mexico rules" (Economía, n/d):

1. **Flat screens.** In 2010 Mexico ranked first worldwide in the value of exports of flat screens, ranking above countries such as China, Germany and the United States.
2. **Coffee with Mexican flavor.** Mexico is the largest producer of organic coffee in the world.
3. **Cell phone production.** In 2010 the country was the third global exporter of cell phones with US\$9.860 million, figure only just behind China and South Korea.
4. **Silver production.** Mexico is the largest producer and exporter of silver worldwide. In 2010 the country obtained almost US\$152.15 million from exports of silver jewelry.
5. **Clean energy generation.** Mexico ranks second in Latin America in wind power generation capacity, with a base of 521 MW, only surpassed by the base of 920 MW in Brazil.
6. **Aviation.** The number of aerospace companies in the Nation has tripled in the last five years. There are currently about 232 firms in this sector, mostly from the United States, Canada and France.
7. **Radio frequency devices.** The country is the world's fourth largest exporter for the three communication sectors.
8. **Automotive.** Mexico is the ninth producer of autos and sixth largest exporter in the world. Estimated production for 2011 is 2.4 million autos, 6% more than in 2010.
9. **Auto parts.** Mexico is the largest supplier of auto parts to the US market.
10. **Health Sector.** Mexico is the world's sixth largest exporter of medical, surgical and dental instruments, and eighth in therapy equipment; it also tenth in respiratory apparatus; twelfth in orthopedic appliances and seventeenth in X-ray and radiation machines.

These are examples of what is being done in Mexico in terms of development of productive corridors and their possible linkages to the energy sector.

***d. Tangible and intangible assets, key for linkage of the hydrocarbons sector with other sectors of the Mexican economy***

To focus on local content strategies and developing productive corridors in the areas most relevant to the hydrocarbon industry, we have used a hypothetical case presented by the representative of British Petroleum (BP) in sessions of the Specialists Team with which this study was carried out.

The Tlálóc case <sup>15</sup> (hypothetical) is an example which illustrates the opportunities for creating productive corridors; it consists of development of five production fields somewhere in the Gulf of Mexico with the parameters presented in Table 2.

**Table 2. Tlálóc case parameters (hypothetical)**

<b>Description</b>	<b>Quantity</b>
Exploratory wells	8
Successful wells	5
Producing wells	66
Injection wells	22
Delimiter wells	8
Reserve to be developed (mmboe)	900
Drilling equipment	Three
Production capacity of the platform (Mboe/ d)	235
Cost of CAPEX projects (billions of dollars)	40

The total investment would have an approximate distribution in the stages shown in Table 3.

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<sup>15</sup> Case Study "Tlálóc" project, to identify the productive chains for local content in Mexico, for the oil and gas exploration and production sector. BP, Eng. Alfredo García Mondragón ([alfredo.garcia@bp.com](mailto:alfredo.garcia@bp.com)), November 5, 2014.

**Table 3. Percentage of total investment by stage**

#	Stages and concepts of investment	Percentage of total investment
1	Exploratory stage (including geology and geophysics, seismic, exploratory drilling and delimitation)	12%
2	Development drilling (includes producer and injection wells), engineering, procurement and construction	55%
3	Underwater equipment	25%
4	Production platform	8%

1. **In the exploration phase**, the main services are:

- Geophysical services.
- Acquisition and seismic processing services.
- Laboratory of cores and hydrocarbons.
- Specialized geoscience technical services.
- Logistics supply.
- Helicopters.

The greatest impact of these services occurs when the fields are being developed since they are critical for successful production.

Disadvantages:

- Not the segment where the productive chains are generated.

2. **In the development drilling stage** (includes producing and injection wells), key services and goods are:

- Logistics supply.
- Well services, geophysical services and various.

- Cementation.
- Piping.
- Diesel and water.
- Helicopters.
- Ports for logistics.
- Storage yards and warehouses.

Opportunities for scale:

- Construction of yards for logistics and storage in ports in the Gulf of Mexico.
- Sale of fuels, piping, cement, warehouses, industrial tools and equipment.
- This is the largest link in the industry's production chain, and absorbs most investment.

Disadvantages:

- The market for drilling in deep water is limited, there 12 companies, including one Mexican.
- If drilling rigs are international in origin, payment of VAT and income tax can be obtained.

3. **Underwater equipment**, in which case the main goods and services are:

- Logistics, boats and cranes.
- Well services.
- Cementation.
- Diesel and water.
- Helicopters.
- Storage yards and warehouses.

Opportunities of scale:

- Sale of consumables, piping, cement, yards, warehouses, industrial tools and equipment.
- Due to its geographical position, the location of this type of industry in Mexico is advantageous for the region.

- Attracting companies with experience in offshore projects could lead to the emergence of a market.
- This would generate substantial flows of resources which would remain with local suppliers.

Disadvantages:

- There are only four companies with technology developed in conjunction with operators.
- There is no market in Mexico for installation of manufacturing plants.
- There are no incentives to invest in Mexico, with the United States as neighbor.

Recommendations:

- The federal government should invite these four companies to invest in Mexico.
- Offer tax incentives to lower the production cost of offshore equipment.

4. **Production platform**, in which case the main goods and services are:

- Logistics, ships and cranes.
- Services wells.
- Cementation.
- Diesel and water.
- Helicopters.
- Yards and warehouses.

Opportunities of scale:

- Sale of fuels, piping, cement, yards, warehouses, industrial tools and equipment.
- This type of industry in Mexico is advantageous for the region.
- Construction of platforms for deep and shallow waters and shipyards in Mexico.
- Local construction companies would supply production modules for deep waters.
- Stimulate supplies from iron production, steel mills and piping manufacturers.
- The opportunity exists to build the first platforms in Mexico.

Disadvantages:

- There 11 construction yards in China, Korea and Singapore. In the United States there are 21, nine in Europe.
- Only Coatzacoalcos could house a shipyard, but the raw material would be far away.
- There are no incentives to invest in Mexico, with the United States as neighbor.

Recommendations:

- Pemex partnership with foreign platform construction companies.
- Tax incentives to lower construction costs.

Opportunities for linkages with other national sectors could take place with goods and service companies that currently make up this sector which is spread along the Gulf Coast, and in a second industrial corridor that goes down from Monterrey-San Luis Potosí-Queretaro-Mexico, where the great majority of technological companies offering specialized services with different places of origin (Halliburton, KBR, Pride, GE, Tenaris, Enasco, Schlumberger, ICA Fluor, among many others).

In conclusion, the steel, cement, construction, transport and infrastructure development industries have to be considered critical for the strategy of generating productive corridors with a positive impact on increasing national content.

## **D. Case studies of local content in the hydrocarbon industry**

To enrich the recommendations and compare the case of the Energy Reform in Mexico with similar processes, four case studies were taken from different countries: Brazil, Colombia, Trinidad and Tobago, and Indonesia.

### ***a. Brazil Case Study: effects of state intervention on use of local content via policy/legislation/regulation***

#### ***i. Context of the Brazilian hydrocarbons sector***

##### Brief history of the sector in the country

The beginning of the oil industry in Brazil can be traced to 1939 when the first oilfields were discovered in Lobato. Exploratory activity was modest until 1954 when Petrobras was created as

a state company with the primary objective of hydrocarbon exploration, production, transportation and refining. The company expanded as more reservoirs were found.

In 1997, Law 9478, known as the Petroleum Law, was passed marking a definitive change for the sector. The Petrobras monopoly became a thing of the past, as the industry opened the exploration, production and marketing phases of hydrocarbons and their products to national and international companies. The National Petroleum Agency (ANP), which acts as regulator of all activities both upstream and downstream, was created.

On August 8, 2014 Petrobras reported its consolidated results in millions of reales. The topics most relevant to our study are listed below.

- Consolidated net income was R\$10,352 million in HY1-2014 and R\$4,959 million in Q2 2014. The consolidated adjusted EBITDA was R\$30,595 million in HY1-2014 and R\$16,246 million in Q2 2014. Market value totaled R\$217,725 million, a 9% increase over 1Q-2014.
- National production of natural gas has grown steadily, achieving monthly records. In June 2014 the record was 418,000 boe/day.
- Oil was discovered in ultra-deep waters in the pre-salt of the Santos basin, with good quality oil (32° API) (Petrobras, 2014).

On November 11, 2014 Petrobras reported consolidated oil and gas production in Brazil and abroad of 2,795,000 barrels of oil equivalent per day during October. The volume was 0.5% higher than in September, achieving a new record.

### Reserves

Table 4 shows proven oil reserves as of December 31, 2013, according to the estimates of the National Agency of Petroleum, Natural Gas and Biofuels/Society of Petroleum Engineers (ANP/SPE).

**Table 4. Volumes of proven reserves in 2013 (ANP/SPE)**

<b>Breakdown</b>		<b>Proven reserves</b>
Brazil	Crude and condensate (billion bbl)	13.512
	Natural gas (billion m <sup>3</sup> )	391.286
	Oil equivalent (boe billion)	15.973
International	Oil and condensate (billion bbl)	0.383
	Natural gas (billion m <sup>3</sup> )	35.485
	Oil equivalent (boe billion)	0.592
Total Petrobras	Crude and condensate (billion bbl)	13.895
	Natural gas (billion m <sup>3</sup> )	426.771
	Oil equivalent (billion boe)	16.565

Source: Petrobras (2013).

**Table 5. Proven reserves in 2013 (ANP/SPE)**

<b>Composition of proven reserves</b>	<b>Brazil (billion boe)</b>	<b>International (billion boe)</b>	<b>Total Petrobras (billion boe)</b>
a) Proven reserves as of December 2012	15.729	0.711	16.440
b) Additions to proven reserves in 2013	1.089	0.052	1.141
c) Sales in 2013	-0.045	-0.111	-0.156
d) Net 2013 (b + c)	1.044	-0.059	0.985
e) Production 2013	-0.800	-0.061	-0.861
f) Annual change (d + e)	0.244	-0.120	0.124
g) Proven reserves as of December 2013 (a + f)	15.973	0.592	16.565

Source: Petrobras (2013).

Note: The apparent differences in additions are due to rounding.

Table 6 reflects reserves as of December 31, 2013, estimated by the Securities and Exchange Commission (SEC).

**Table 6. Volumes of proven reserves in 2013 (SEC)**

<b>Breakdown</b>		<b>Proven reserves</b>
Brazil	Crude and condensate (billion bbl)	10.658
	Natural gas (billion m <sup>3</sup> )	299.20
	Oil equivalent (billion boe)	12.540
International	Crude and condensate (billion bbl)	0.374
	Natural gas (billion m <sup>3</sup> )	35.491
	Oil equivalent (billion boe)	0.583
Total Petrobras	Crude and condensate (billion bbl)	11.032
	Natural gas (billion m <sup>3</sup> )	334.691
	Oil equivalent (billion boe)	12.123

Source: Petrobras (2013).

**Table 7. Proved reserves in 2013 (SEC)**

<b>Composition of proven reserves</b>	<b>Brazil (billion boe)</b>	<b>International (billion boe)</b>	<b>Total Petrobras (billion boe)</b>
a) Proven reserves as of December 2012	12.263	0.621	12.884
b) Additions to proven reserves in 2013	1.122	0.096	1.218
c) Sales in 2013	-0.045	-0.073	-0.118
d) Net 2013 (b + c)	1.077	0.023	1.100
e) Production 2013	-0.800	-0.061	-0.861
f) Annual change (d + e)	0.277	-0.039	0.238
g) Proven reserves as of December 2013 (a + f)	12.540	0.583	13.123

Source: Petrobras (2013).

Note: The apparent differences in additions are due to rounding.

**Table 8. Historical national reserves**

<b>Historical national proven reserves of oil, LNG and natural gas</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>
Oil (MMbbl)	13.458	13.219	13.154	12.841	11.986	11.900
Oil and LNG (MMbbl)	13.512	13.284	13.218	12.909	12.057	11.969
Oil and LNG (million m <sup>3</sup> )	2.148	2.112	2.101	2.052	1.917	1.903
Natural Gas (MMbbl)	2.461	2.445	2.488	2.374	2.113	2.124
Natural Gas (million m <sup>3</sup> )	391.286	388.746	395.521	377.365	335.843	337.620
Oil, LNG and natural gas (MMbbl)	15.973	15.729	15.706	15.283	14.169	14.093
Oil, LNG and natural gas (million m <sup>3</sup> )	2.539	2.501	2.497	2.430	2.253	2.241
<b>Historical national proven reserves of oil, LNG and natural gas</b>	<b>2007</b>	<b>2006</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>
Oil (MMbbl)	11.723	11.592	11.303	10.977	10.536	9.510
Oil and LNG (MMbbl)	11.802	11.671	11.365	11.054	10.613	9.557
Oil and LNG (million m <sup>3</sup> )	1.876	1.856	1.807	1.757	1.687	1.519
Natural gas (MMbbl)	2.118	2.082	1.868	1.969	1.989	1.452
Natural gas (million m <sup>3</sup> )	336.715	331.027	296.941	313.052	316.183	230.812
Oil, LNG and natural gas (MMbbl)	13.920	13.753	13.233	13.023	12.602	11.009
Oil, LNG and natural gas (million m <sup>3</sup> )	2.213	2.187	2.104	2.070	2.003	1.750

Source: Petrobras.

### Institutional structure of the sector: legislative changes

In Brazil there have been a large number of reform processes which explain the development of the oil sector. The first was under President Cardoso in 1995, when a new legal framework was created for administration of the state hydrocarbon monopoly, paving the way for foreign investment. Petrobras is now an integrated energy company with activities along all the oil and gas production chain, as well as generation of biofuels and other alternative energies.

The institutional design that emerged from the first wave of reforms established several agencies involved in the activities of the sector. The Ministry of Mines and Energy, and the

National Energy Policy Council, are jointly responsible for setting strategy and formulating the country's energy policy. The National Petroleum Agency was established to promote regulation and contracting (concessions) and supervision of the economic activities integrated in the oil, natural gas and biofuels industry. Similarly hydrocarbon resources were transferred to private companies and to Petrobras, depending on the specific activity. With the new scheme, Petrobras ceased to be a state monopoly and had to adapt to competition.

Although the opening of the hydrocarbons sector in Brazil began over 19 years ago, Petrobras still supplies 92% of the production platform, leaving the remaining 8% to StatOil, Chevron, Shell, BP Energy and OGX.<sup>16</sup> which shows that the State has not been entirely displaced. Petrobras also continues to dominate natural gas production with 83.4% of the market. In contrast, the private sector dominates the distribution process with 73.3% market share.

The opening to private investment under the premise that the State would maintain majority votes in the company was in fact a partial privatization scheme. Since then the decisions of the company have been vested in a Board of Directors formed by ministries and representatives of the minority shareholders. It is an collegial body and autonomous subject to its prerogatives and responsibilities in the reform of the law and its Bylaws.

With respect to taxation, new instruments were enacted to channel income from the sector to the Brazilian State.<sup>17</sup>

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<sup>16</sup> See [http://www.milenio.com/negocios/Ronda\\_Cero-Pemex-Brasil-Petrobras-bloques\\_azules\\_0\\_277772413.html](http://www.milenio.com/negocios/Ronda_Cero-Pemex-Brasil-Petrobras-bloques_azules_0_277772413.html).

<sup>17</sup> See <http://imco.org.mx/wp-content/uploads/internacional/ICI2013-completo.pdf>.

**Table 9. Organization of the oil sector in Brazil**

<b>Agency</b>		<b>Function</b>
Management and legislation	Chamber of Deputies and Senate	Power to pass laws of national scope and amend the Constitution.
Strategy and implementation	Ministry of Mines and Energy	Proposes and implements policies on energy and production of the mineral resources of the country
	National Council for Energy Policy	Defines hydrocarbon import and production policies, to guarantee reliable supply in the domestic market.
	Energy Research Company	Provides the Ministry of Mines and Energy with studies on energy and electric power, oil, natural gas, coal and renewable sources for planning the energy sector.
Regulation and supervision	National Petroleum Agency	Promotes the regulation, contracting and supervision of integrated economic activities in the oil, natural gas and biofuel industry.
	PPSA Pré-Sal	State company responsible for negotiating contracts of partition of hydrocarbon production and marketing in the Pre-Salt area (it is a regulator, not operator).
	Brazilian Institute of Environment and Renewable Natural Resources	Grants operating licenses based on criteria of environmental protection and sustainable use of natural resources.
State implementation	Petrobras	Vertically integrated mixed State oil operator. Operates in exploration and production, refining, transportation and marketing of oil and gas, petrochemicals, biofuels and their products.

Source: IMCO, with information from the National Petroleum Agency of Brazil and Petrobras.

The changes in the legal framework supposedly meant opening and competition; however, Petrobras's participation has remained dominant in almost all activities, since in practice the company plays the role of integrated monopoly and national and international energy conglomerate, as can be seen in Table 10, which presents the industrial organization of the oil and natural gas sector, and shows Petrobras's role, comparing the situation before and after the passage of the Petroleum Law.<sup>18</sup>

<sup>18</sup> See <http://www.cepal.org/cgi-bin/getProd.asp?xml=/publicaciones/xml/8/51428/P51428.xml&>.

**Table 10. Petrobras's role in the industrial organization of the sector:  
comparison of the situation before and after the Law**

<b>Activity</b>	<b>Legal authority</b>	<b>Execution</b>		<b>Role of Petrobras (PB)</b>
		<b>Before opening (Law 9.478/1997)</b>	<b>After opening (Law 9.487/1997)</b>	
E&P (Oil and natural gas)	National monopoly	PB legal monopoly	E&P concession holder (Competition)	Production PB (80%); PB & partners (19.96%); new business (0.05%). Participation in exploration areas; PB (40.31%); others (59.69%)  Entry of new/small businesses; 69 entrants
Refining (oil)	National monopoly	PB legal monopoly	Subject to approval by ANP (competition)	Petrobras: 98.4%.
Processing (natural gas)	National monopoly	PB legal monopoly	Subject to approval by ANP (competition)	Petrobras: 100% = participation in natural gas processing units. Petrobras (95%) PB & partners (5%).
Import and export (oil and natural gas)	National monopoly	PB legal monopoly	Subject to approval by ANP (competition)	Petrobras: 90.9% of natural gas imports; self-sufficiency in oil production.
Transportation (oil)	National monopoly	PB legal monopoly	Breakdown with free access for new agents	Gas pipelines: 70% operated by Petrobras.  Water transport: 81 companies authorized by ANP.
Transportation (natural gas)	National monopoly	PB legal monopoly		Transfer gas pipelines: 100% operated by PB  Transport gas pipelines: 45.9% operated by Transpetro (PB subsidiary); 53.9% by PB and partners (TBG; Gasocidente, Nova Transportadora Nordeste; TNS).
Distribution (oil products)	Competition	Competition	Competition	BR Distribuidora (PB subsidiary): 34.4%.  248 distributors in operation.
Retail sales (oil products)	Competition	Competition	Competition	Resellers: white flag (43.1%) BR (16.8%); Ipiranga (10.9%); others (29.2%).

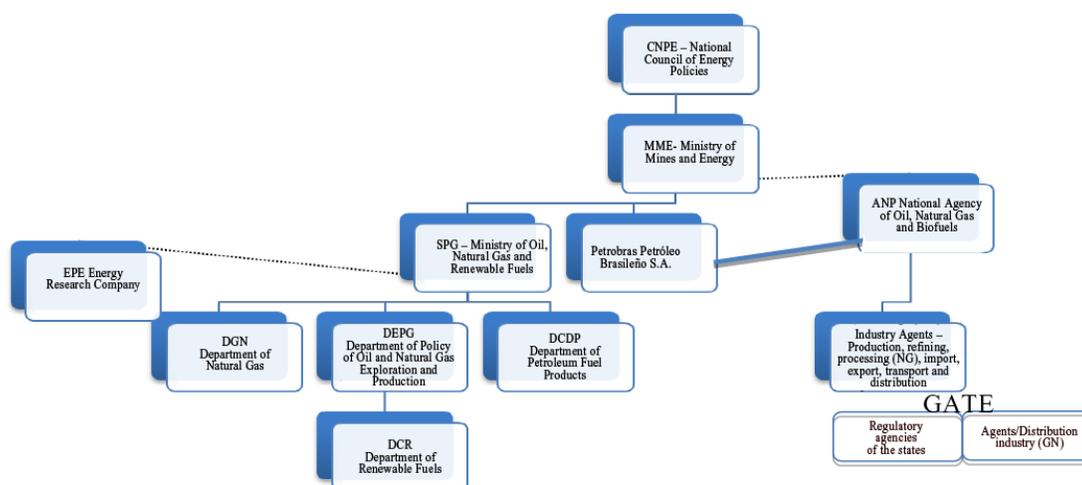
**Table 10. Petrobras's role in the industrial organization of the sector: comparison of the situation before and after the Law**

Activity	Legal authority	Execution		Role of Petrobras (PB)
		Before opening (Law 9.478/1997)	After opening (Law 9.487/1997)	
Distribution (natural gas)	Monopoly of the states	Distribution concession holders of the states	Private distribution concession holders of the states	GNV: leadership Petrobras (31%) of the market through the BR distributor.  Residential and industrial: of a total of 24 distributors; Petrobras is a shareholder in 19 and owns 1 through BR.
Distribution (LNG)	National monopoly	Private concession holders and Petrobras operating under area reserve.	Submitted for approval by ANP (competition)	Distribution: Ultragaz (23.3%): SHV Gas Brasil (23.0%): Liquigás subsidiary of Petrobras (22.3%) Nacional Gas (18.3%): Copagaz (7.4%) others (10 ) (5.7%).  Resellers: about 15,000 companies nationwide.

Source: ECLAC and several IEE-USP, 2009 data.

The structure of the sector is shown in Figure 9.

**Figure 9. Institutional structure of the oil, natural gas and biofuel sector in Brazil**



Source: ECLAC and several IEE-USP, 2009 data.

### *i. Challenges*

Analysts assume that, even with the rapid expansion of the oil services industry at national level, Petrobras will have to rely heavily on foreign companies and manpower to comply with the plans announced.

Brazilian infrastructure also faces some challenges; ports, airports and roads in the country are already overburdened because growing economic demand has overtaken domestic investment in infrastructure.

#### Challenges related to the exploration

The logistical and political challenges involved in development of deposits create uncertainty in the future.<sup>19</sup>

#### Challenges related to production

One of the main objectives of the Brazilian government is the goal of increasing national energy production to meet domestic demand, as well as becoming an exporting country.<sup>20</sup>

### *ii. Local content legislation*

One of the main concerns for Brazilians is to protect the local economy. Instead of following a concession contract model, it was decided to opt for shared production contracts with national content specifications, with Petrobras heading the entire development process. In 2010 the government created a new state entity, Pré-Sal Petróleo S.A. (PPSA). This entity, which is not an operator, owns all Pre-Salt fields, manages the resources produced and can veto projects if they are not compatible with the national interest. Under the new system, the government stipulated that Petrobras form part of the winning consortium with a share of not less than 30%.

Since 1997, when the industry was formally deregulated, Petrobras investments have gone hand in hand with national and foreign private investment. The oil sector was opened respecting the great power of Petrobras, but on that basis the company was exposed to competition, which has led to a significant number of partnerships between companies in the sector.

Petrobras recognizes that its most valuable core business is its investments in exploration and production, which account for 57% of all its investments. However, the strategy specifies 95%

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<sup>19</sup> See [http://www.frbatlanta.org/documents/pubs/econsouth/11q1\\_brazil\\_oil\\_spanish.pdf](http://www.frbatlanta.org/documents/pubs/econsouth/11q1_brazil_oil_spanish.pdf).

<sup>20</sup> See [http://www.frbatlanta.org/documents/pubs/econsouth/11q1\\_brazil\\_oil\\_spanish.pdf](http://www.frbatlanta.org/documents/pubs/econsouth/11q1_brazil_oil_spanish.pdf).

of its investments in Brazil and only 5% of the total in activities abroad, in order to strengthen local development as a lever for national development. In addition, the strategy favors national suppliers, and foreign corporations are even obliged to include national suppliers in the business, which are also benefited by a development bank that authorizes loans to national companies to participate in oil projects. Sound finances and modern actions have made Petrobras into one of the best companies in the world. Petrobras does not come within the Brazilian budget and its tax rate is 31%.<sup>21</sup>

### Legislation and results

The state company produces 95% of Brazil's oil. Private oil companies operate under tax and royalty agreements and must pay royalties (10% production) and special participations to the Treasury. This income is distributed according legal assignments, in district savings funds, government ministries, and municipalities where the resource has been produced. Thanks to the new Law, oil production and participation of the sector in the economy increased, in addition to private participation, due to the increase in the number of concessions.

Thanks to the legislation passed, new reserves have been incorporated, especially in 2004-2010 in terms of total proven reserves, partly as a result of the Pre-Salt discoveries. According to the Ministry of Energy, between 1972 and 2010, reserves increased 1.075% because of investments and exploration efforts. From 798 million barrels in 1972 reserves increased to 4,513 million barrels in 1990 and 12.246 million barrels in 2010.

### Expected results or goals

In the oil segment, despite attempts to inhibit the participation of Petrobras in the expansion of the sector and facilitate appropriation of the transfer of geological and prospectivity knowledge, foreign investment was attracted in most cases into blocks and segments with higher return and less risk, avoiding entering the chain; for example in refining, where expected returns are lower. With the change of government in 2002, and based on the 2003 business plan, Petrobras resumed its major role as a driver of sectorial development in oil and natural gas and in biofuels.

In 2003 the Mobilization Program of the National Oil and Natural Gas Industry (Prominp) was introduced, which is basically a guide for monitoring compliance with the rules on use of local content. Since its inception, the Prominp has significantly increased the participation of local

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<sup>21</sup> See <http://energiaadebate.com/experiencias-y-modelos-en-la-industria-petrolera-el-caso-de-brasil/>.

industry, and investment in the oil and gas sector rose from 57% in 2003 to 75% in the first half of 2009. This represents an additional value of \$14.2 MMDD of goods and services purchased in the Brazilian market. Estimates suggest that about 640,000 new jobs were created in this period. In summary, investments in Prominp significantly increased local participation, from \$35 MMDD between 2003/2007 to \$190 MMDD for the years 2009/2013.

#### Existing laws and regulations

Existing legislation does not expressly include a law on local content, and development of local industry is mentioned only in the section on basic principles of national energy policy. In the first bidding processes held by the National Petroleum, Natural Gas and Biofuels Agency (ANP), the use of local content was mainly regulated by concession contracts. Later, the Agency established specific rules with monitoring and reporting on local content.

With respect to the regulations, the National Petroleum Agency (ANP) established a system for creating a certificate on local content, to be applied to concession agreements between the ANP and concession holders. This would be consistent with the regulations established with Prominp. The local content certificate is a document issued by a "registrar" authorized by the ANP. The most important "regulator" is ONIP, which is used by Petrobras for most of its contracts.<sup>22</sup>

The ANP is responsible for applying local content policy through bidding rounds for concession of exploration rights, and development of oil and natural gas production in the blocks. The evaluation is based on three main points: the money value offered per block, investments in exploration, and local content. That is, the commitment to acquire goods and services from the national industry under competitive conditions.

As time has passed, the weight of the local content percentage for obtaining concessions has been increasing. Local content requirements have also been transferred to international suppliers to the industry, closing the cycle with control mechanisms and monitoring of local content compliance, controlled by the same agency. Petrobras also has a central role in developing the supply industry in the country, not only by meeting local content, but also through a procurement policy that was always aimed at creating incentives for local production.

It is important to note that the expansion of Brazil's hydrocarbon industry operates in a framework in which the Federal Constitution grants monopoly conditions to various activities

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<sup>22</sup> See [http://www.nocal.com.br/pdf/Resource\\_Library/International/Local\\_Content\\_In\\_Brazil\\_Oil\\_Industry.pdf](http://www.nocal.com.br/pdf/Resource_Library/International/Local_Content_In_Brazil_Oil_Industry.pdf).

related to the sector. In this respect, the federal government maintains a strong negotiating capacity with international companies.<sup>23</sup>

### *iii. Analysis of the effects in different areas*

#### Production of hydrocarbon resources

The National Bank for Economic and Social Development (BNDES) estimates that development of offshore oil fields could generate \$240,000 million in goods and services. The government wants 65% of these purchases to be acquired domestically, with the aim of developing the national oil services industry.<sup>24</sup> There are several decrees and public policies designed to increase the local content of all the bidding processes in which not only national or foreign companies take part but even Petrobras itself.. Decree Num 4.925/2003 sets the objective "to maximize participation of the national industry of goods and services based on competition and sustainability in oil and natural gas projects in Brazil or abroad; increased training and national technological development and local professional training."

Local content policies act on a specific phase of the production process, creating incentives for local economic links, thus favoring a vertical-type business development. These policies emphasize technology transfer.

Following reform Law 9.487/1997, in 1997 Petrobras lost its monopoly in the sector, with the establishment of a system of concessions that allowed the entry of foreign companies. However, the fact that Petrobras continued to be the "dominant" company has resulted in technological spillovers. At the start, in the 1950s, Petrobras imported all the technology for its facilities; since then, it has developed strategies to reduce the disadvantage of its technological capabilities with foreign companies. At the same time strategies to promote a local industry for domestic consumption were put in place. As soon as a capital goods industry was set up in Brazil, Petrobras began to place orders.

Today in Brazil there is an awareness that the oil companies are allowing their suppliers to gain competitiveness in the national and international market. As a result, inspired by the Norwegian model, vertical spillovers are developing, favoring the contracting of local suppliers in sections where there is higher added value. The Brazilian government has been treating the bidding

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<sup>23</sup> See [http://www.ungs.edu.ar/ms\\_ungs/wp-content/uploads/2013/09/Suplemento\\_UNGS\\_03\\_web.pdf](http://www.ungs.edu.ar/ms_ungs/wp-content/uploads/2013/09/Suplemento_UNGS_03_web.pdf)

<sup>24</sup> See [http://www.frbatlanta.org/documents/pubs/econsouth/11q1\\_brazil\\_oil\\_spanish.pdf](http://www.frbatlanta.org/documents/pubs/econsouth/11q1_brazil_oil_spanish.pdf)

rounds as a process of technological appropriation, based on liberal conditions, starting with valuation of voluntary memories of technology transfer and local content and ending with imposition of quotas for each production subsystem based on the estimated capacity of the economy, and following the same method as BNDES for financing capital goods. This has resulted in greater control of the production chains.

Pre-Salt represents one of the greatest technological and logistical challenges of the hydrocarbons sector in Brazil, since the deposits are in the ocean below 2 km of salt. To reach these reserves, 2km of ocean have to be crossed, over 1km post-salt rock and a final layer up to 2 km thick, all within 150 km of the coast. However, the government has not relaxed the local content conditions but on the contrary has opted to increase its strategic control of the deposit with the objective of deepening technological spillovers.<sup>25</sup>

#### Development of industries/sectors associated with the sector

The National Petroleum Agency was created as a government regulatory body for all upstream and downstream activities. The process of opening the oil sector in Brazil has greatly boosted the local industry; even though the main beneficiaries have been the conglomerates of the large utility companies,<sup>26</sup> an entire technological sector has been developed (as mentioned above).

Part of the success of Petrobras has to do with investment in human resources training, research and technological development, and alignment of the Business Plan with Petrobras University and its research and technological innovation institutes. All this goes hand in hand with the obligation to have a high national content in goods or services provided by the suppliers of Petrobras, whether local or foreign. There is also a financial system that grants loans to Petrobras suppliers, and a development bank that finances the productive projects of the Brazilian oil company, and the production chains of the companies around the industry. For its part, the government has created the conditions in which company and industry have expanded through a multiplier effect on the economic business cycle in Brazil. And Petrobras has functioned as a lever for economic development, generating significant industrial growth.

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<sup>25</sup> See [http://realinstitutoelcano.org/wps/portal/rielcano/contenido?WCM\\_GLOBAL\\_CONTEXT=/elcano/Elcano\\_es/Zonas\\_es/DT7-2012](http://realinstitutoelcano.org/wps/portal/rielcano/contenido?WCM_GLOBAL_CONTEXT=/elcano/Elcano_es/Zonas_es/DT7-2012).

<sup>26</sup> See [http://www.revistasice.com/CachePDF/ICE\\_810\\_163-179\\_\\_07DC6F3C5CD96AB6229014E9032C089D.pdf](http://www.revistasice.com/CachePDF/ICE_810_163-179__07DC6F3C5CD96AB6229014E9032C089D.pdf).

**Table 11. Petrobras in numbers (company profile)**

Investments	R\$104,410 million
Sales revenue	R\$304,890 million
Net profit	R\$23,570 million
Shareholders	798,596
Global presence	17 countries
Number of employees	86,111
Daily output	2,539,000 barrels of oil equivalent per day
Proven reserves	16,570 million barrels of oil equivalent
Production platforms	134 (77 fixed and 57 floating)
Refineries	15
Production of products	2,124,000 barrels per day
Fleet of ships	326 (57 owned)
Pipelines	34,639 km
Biofuels	5 biodiesel plants: 3 owned and 2 in partnership / 10 ethanol plants in joint venture.
Thermoelectric	21 plants
Wind Power	4 plants
Service Stations	7,710
Fertilizers	3 factories

Source: Petrobras, last updated (May 2014).

Note: Visit the link <http://www.petrobras.com/es/quiene-somos/perfil/>.

There are even press releases which explain that the government is doing everything necessary to continue developing the sector. The oil and gas industry is working with the Brazilian government to implement measures to stimulate development of the supply chain. The focus will be on funding for research and innovation to substitute imports or produce more technologically complex goods.<sup>27</sup>

<sup>27</sup> See <http://www.hidrocarburosbolivia.com/iberoamerica-mainmenu-98/brasil-mainmenu-97/67641-brasil-dilma-impulsa-cadena-de-proveedores-locales-para-la-industria-petrolera.html>.

There are about 20,000 companies around Petrobras which are part of its supply chain. For this industry to grow, more investments will be need to be found for the sector. For example, the country's shipping industry is being revitalized. In the words of José Sergio Gabrielli de Azevedo, president of Petrobras (2005-2012), for the hydrocarbons sector the shipping industry has grown in five years from 2,000 jobs to 58,000 jobs; and most of the demand is coming from Petrobras. In an effort to stimulate Brazilian companies, a percentage of content produced in Brazil has been established so that companies can begin to produce goods that previously had to be purchased abroad.<sup>28</sup>

### Employment levels

Jobs grow from the hand of investments in the sector and expansion of the industry. As mentioned in the previous point, 56,000 jobs were created with the rise of the shipping industry. With foreign investment direct jobs have been created with each new plant, for example, the investments of NKT created 400 direct jobs in a single project.

### Investment levels

#### *Upstream*

Starting in 1998, adapting to the new legislation, Petrobras launched a series of upstream policies so that it could compete with the foreign firms that were about to enter the oil industry. The company signed partnership agreements with foreign companies for exploration and production of lots owned by Petrobras. It also began to participate in bidding processes for new lots, and made major investments in the form of finance for projects financed either by national or foreign entities, which are repaid from the sale of oil from the projects financed.

#### *Downstream*

Following the opening of the oil economy, conditions have been created for stimulating competition in this segment.<sup>29</sup> Most of the country's refineries are owned by Petrobras. As these refineries have needed investment for modernization, they have looked for partnerships with private companies to finance them.

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<sup>28</sup> See <http://www.petrobras.com/es/magazine/post/reaccion-en-cadena.htm>.

<sup>29</sup> Véase <http://energiaadebate.com/experiencias-y-modelos-en-la-industria-petrolera-el-caso-de-brasil/> .

### *Investments and national content*

Since 2011, foreign companies have considered Brazil a key country for investment, generating economic growth and jobs for Brazilians. Petrobras recognizes investments in exploration and production as its most valuable core business, accounting for 57% of all its investment.

#### *iv. Comparison with the case of Mexico, specifically in certain benchmarks*

There are two benchmarks:

- a. *Local content* practices built on market forces with no state intervention or legislation/regulation
- b. Development of *local content* as a result of enactment of policy/legislation/regulation.

The Petrobras website shows the programs in response to paragraph b):<sup>30</sup>

- *Progridir*: allows small and medium suppliers to quickly obtain low-cost standardized loans from an associated bank.
- Credit Right Investment Funds (FIDC): is an opportunity for suppliers with which Petrobras has contact to obtain capital and financing at lower rates than on the market.
- Petrobras-Sebrae Agreement: for integration of micro- and small-sized enterprises in the oil, gas and energy production chain.
- GrowProgram: aims to include families of farmers in biodiesel production and procurement inside the production chain.
- Suppliers channel: provides information and support services to companies that are either supplying or wish to supply goods and services to Petrobras.

With respect to the specific issue of comparison of the case of Brazil with Mexico, the following clarifications are valid:

- Brazil had started its market opening in 1976, and the nationalist sense and idea of favoring national consumption are much stronger than in Mexico.
- Mexico is just beginning the process of opening its hydrocarbons sector, but had

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<sup>30</sup> See <http://www.petrobras.com.br/en/society-and-environment/society/contribution-to-development/>.

historically maintained a percentage of national content, relatively lower than Brazil, during the period when Pemex operated as a monopoly.

- The most important lesson for Mexico lies in the combination that Brazil makes between two forces: legislation-regulation and market forces. Both are involved in a consumption policy or culture and domestic development, which result in concrete actions with teaching programs in technological research, support from development banks to local suppliers, tax incentives for investment in the sector and for promoting partnerships of foreign companies with technology transfer commitments. All this while maintaining a strong legislation with growing national content requirements.

The data presented in Tables 12 and 13 show the growing trends in crude and gas production and reserves in Brazil.

**Table 12. Annual production volume (over 10 years) of crude and gas**

<b>Brazil</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Crude oil *	1,477	1,634	1,723	1,748	1,812	1,950	2,055	2,105	2,061	2,024
Natural Gas *	61.5	79.3	86.4	84.7	86.4	78.7	82.7	87.5	87.8	90.2
Total	1,539	1,713	1,809	1,833	1,899	2,029	2,137	2,192	2,149	2,114.1

\* Thousands of barrels per day.

**Table 13. Annual volume of reserves (over 10 years) of crude and gas**

<b>Brazil</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Proven crude reserves *	8.50	10.60	11.24	11.77	12.18	12.62	12.80	12.86	13.99	13.15	13.22
Proven natural gas reserves**	1.51	1.57	2.05	1.93	2.19	2.30	2.29	2.30	2.62	2.49	2.45

\* Billions of barrels.

\*\* Billions of barrels.

## ***b. Colombia Case Study: effects of state intervention on use of local content via policy/legislation/regulation***

### *i. Context of Colombia's hydrocarbon industry*

#### Brief history of the sector in the country

In 1951 Ecopetrol, the Colombian Petroleum Company, was set up to take over the fields where private operators had lost their concessions. In 1969 the concessions were exchanged for shared production or partnership contracts; private operators were responsible for exploration risks and costs, while Ecopetrol held a 50% share in the investments needed for production during 25 years, as well as receiving 50% of production in royalties.

After the discovery of the Caño Limón deposit in 1983, Colombia became an exporter of crude. This oil boom generated political and social pressure to negotiate contracts and increase oil revenues.

Colombia began to reduce participation by third parties and lower the returns on these contracts, prompting private companies to begin to withdraw from the exploration process, and activities in this area began to decline. This led to a 30% fall in oil production and significant reductions in investment.

Faced with this crisis, early this century the State began to grant concessions in which it received royalties of up to 11% of production, with a duration of 50 years. A scheme was needed that would attract investors, both national and foreign. So in 2003 the hydrocarbons sector was restructured and the National Hydrocarbons Agency and Ecopetrol S.A. were created.

#### Institutional framework and chronology

With enactment of Decree 1.760 of 2003, which consolidated the bases for restructuring the hydrocarbons sector in Colombia, the country established the legal, technical and administrative conditions necessary to boost the sector.

The functions are separated in different entities, with the Ministry of Mines and Energy responsible for formulating policies and strategies in the industry. The institutional structure of the sector was composed of: <sup>31</sup>

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<sup>31</sup> See <http://imco.org.mx/wp-content/uploads/internacional/ICI2013-completo.pdf>.

- *Special administrative units:* Mining and Energy Planning Unit, Energy and Gas Regulatory Commission, and National Hydrocarbons Agency.
- Public institutions: Institute of Geo Scientific, Mining Environmental and Nuclear Research and Information, and the Institute of Planning and Promotion of Energy Solutions.
- Related entities: Ecopetrol S.A., Empresa Colombiana de Gas, Interconexiones Eléctricas, etc.

Ecopetrol is now dedicated exclusively to the activities of the industry and can form partnerships and compete with private companies for exploration and production of the resource.

It is the only vertically integrated oil company in the country, operating in exploration and production, transportation and logistics, refining and petrochemicals, and sales and marketing of crude.

#### Private share of the market

In Colombia 52% of companies in the hydrocarbons sector are national in origin; however, it is the foreign companies that have the largest share of the income of the industry (67%). Also, most local companies are medium sized.

#### History of oil and gas production and reserves in Colombia

Table 14 presents the statistics on reserves and annual production of crude and gas since 2000. As can be seen the crude and gas reserves/production ratio (R/P) has been following a downward trend.

**Table 14. Statistics of crude reserves and annual production in Colombia**

Year	Crude (million barrels)			R/P ratio (years)
	Proven reserves (1) (Mbbbl)	Annual Production (MBBL)	Annual incorporation (MNNL)	
2000	1,972	251	-68	7,9
2001	1,842	221	91	8,4
2002	1,632	211	1	7,7

**Table 14. Statistics of crude reserves and annual production in Colombia**

Year	Crude (million barrels)			R/P ratio (years)
	Proven reserves (1) (Mbbbl)	Annual Production (MBBL)	Annual incorporation (MNNL)	
2003	1,542	198	108	7.8
2004	1,478	193	128	7.7
2005	1,478	192	167	7.6
2006	1,453	193	250	7.8
2007	1,510	194	42	7.0
2008	1,358	215	524	7.8
2009	1,668	245	565	8.1
2010	2,058	287	357	7.2
2011	2,259	334	535	6.8
2012	2,377	346	464	6.9
2013	2,445	368	436	6.6
2014		178		

Source: For 2000-2007, Ecopetrol SA; for 2008-2012 ANH.

**Table 15. Statistics of gas reserves and annual production in Colombia**

Year	Gas (giga cubic feet)			R/P ratio (years)
	Proven reserves (GCF) (1)	Annual production (GCF)	Annual incorporation (GCF)	
2000	6,188	210	-243	29.5
2001	7,489	218	1,519	34.4
2002	7,187	220	-82	32.7
2003	6,688	211	-288	31.7
2004	7,212	224	748	32.1

**Table 15. Statistics of gas reserves and annual production in Colombia**

Year	Gas (giga cubic feet)			R/P ratio (years)	
	Proven reserves (GCF) (1)	Annual production (GCF)	Annual incorporation (GCF)		
2005	7,527	236	552	31.8	
2006	7,349	248	70	29.6	
2007	7,084	(2)	266	2	26.6
2008	7,277	(3)	319	512	22.8
2009	8,460	(4)	371	1,554	22.8
2010	7,058	(5)	398	-1,004	17.7
2011	6,630	(6)	387	-41	17.1
2012	7,008	(7)	423	801	16.6
2013	6,409	(8)	428	-171	15.0
2014			204		

Source: For years 2000-2007, Ecopetrol SA; for 2008-2012, ANH.

(1) Proven reserves: report at December 31.

(2) Of which 3,746 GCF correspond to proven reserves.

(3) Of which 4,384 GCF correspond to proven reserves.

(4) Of which 4,737 GCF correspond to proven reserves.

(5) Of which 5,405 GCF correspond to proven reserves.

(6) Of which 5,463 GCF correspond to proven reserves.

(7) Of which 5,727 GCF correspond to proven reserves.

(8) Of which 5,508 GCF correspond to proven reserves.

### Main challenges related to exploration and production

The main challenges for hydrocarbon exploration in Colombia are:

- Find new reserves since Colombian reserves are considered scarce by international standards.
- The troubling question of the opening of the sector in Mexico which will attract international investors looking for greater benefits by investing in Mexico vs. Colombia.
- Levels of social conflict.

The main challenges for hydrocarbons production in Colombia are:<sup>32</sup>

- Social challenges, due to the possibility of blockades and attacks on pipelines.
- Maintain production levels (in April 2014 production fell by 2% from the same period of 2013).
- Growing international competition.
- The high level of technological and logistical sophistication of the world industry.
- Uncertainty about future trends in international prices.
- Strong demand for skilled labor in construction sector activities<sup>33</sup>.

## *ii. Local content legislation*

### Reasons for enactment or not of legislation/regulation

During Colombian history there have been a series of laws governing oil concession contracts, based on different views of the decision makers of the State.

In the 1990s circumstances appeared which prevented the State from supplying sufficient production; reserves began to decline, and the fear arose of moving from exporter to importer. This situation concerned the authorities which began to promote new legislation for the sector and to bring in rules to attract foreign investment.

In this change, the State played a role of facilitator, promoter and supervisor, and did not intervene directly in economic activity. For example, Law 110, independent legislation for oil, established the possibility of granting temporary concessions for production, with prior approval of Congress. Among other things, the Law stipulates that concession contracts must generate royalties in favor of the State.

In 2004, in addition to payment of royalties and taxes, a scheme to determine the commitments and distribution of oil revenues between the parties was proposed. Thus, not only the investment that reaches the sector but also the income that the State appropriates in the exploitation of this natural resource depend on adequate contractual conditions.<sup>34</sup>

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<sup>32</sup> [32] See [http://www.acp.com.co/images/pdf/petroleoygas/vae\\_para\\_web/Actividad%202013%20y%20perspectivas%20para%202014%20-junio2014.pdf](http://www.acp.com.co/images/pdf/petroleoygas/vae_para_web/Actividad%202013%20y%20perspectivas%20para%202014%20-junio2014.pdf)

<sup>33</sup> See <http://www.fedesarrollo.org.co/wp-content/uploads/2011/08/Pol%C3%ADtica-de-proveedores-del-sector-petrolero-Informe-Final-Ismocol-Nov-2012.pdf>.

<sup>34</sup> See <http://www.banrep.gov.co/sites/default/files/publicaciones/archivos/borra692.pdf>.

The issue of the national component in exploration and production is not specified as such in the contract scheme. There are some discounts on royalty payments if investments are made in productive fixed assets, or in periods of exploration without production, or donations and investments in research and development are made.

In addition, for each economic right included, there is a specific payments scheme, as shown in Table 16.

**Table 16. Payments for economic rights in Colombia**

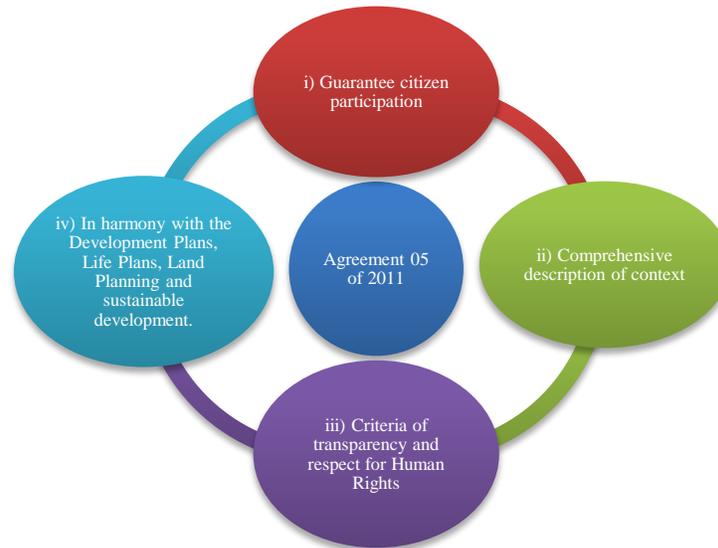
<b>Economic rights</b>	<b>Payment to be made</b>
Rights for use of subsoil and subsurface	An amount in US dollars per hectare, according to location, area of block and duration of phase.
Rights for production (including evaluation phase)	An amount in US dollars per barrel.
Right to participate	A percentage of production (after royalties) agreed in the contract).
Right to produce quantities or high prices	If cumulative production of the production area, including the volume of royalties, exceeds 5 million barrels and/or the reference price is higher than the price stated in the contract, the ANH would be entitled to a part of net production of royalties according to a formula established in the contract.

Source: National Hydrocarbons Agency (ANH).

Community benefit programs coexist. These are compulsory social investments made by companies in the industry.<sup>35</sup> For the National Hydrocarbons Agency (ANH) it is important that when exploration and exploitation contracts are signed, they specify the terms and conditions under which the contractors will generate programs to benefit the communities where they will work.

<sup>35</sup> See <http://www.pnud.org.co/guiapbc/presentacion.html>.

**Figure 10. Good practice guide for the hydrocarbons sector in Colombia**



The State considers the organizations as important allies for generating economic growth. There is also the "Colombian technical guide to good practice in the hydrocarbons sector" (GTC).<sup>36</sup>

#### Expected results or goals

The economic impact generated by hydrocarbon activity in Colombia is reflected in the growth of factors such as the evolution of the reserves, exploration and drilling, which, for example, between 2012 and 2013, increased by 5.22%, 47% and 38% respectively.<sup>37</sup> In 2013 oil GDP grew 7% annually, outpacing the growth of the whole economy (4%).

The oil services sector generates high value added in the national economy, mainly because production depends significantly on other sectors, stimulating national production. For every peso spent on intermediate consumption by the oil services sector, Col\$1.57 pesos of demand is generated in other sectors of the economy.<sup>38</sup>

#### Review of literature, laws or regulations

The Colombian State is responsible for ensuring development of the country on conditions of

<sup>36</sup> See <http://www.icontec.org/images/comite-238/proyecto-guia-tecnica-colombiana.pdf>.

<sup>37</sup> See <http://www.acp.com.co/index.php/es/petroleo-y-gas/asuntos-economicos>.

<sup>38</sup> See <http://www.fedesarrollo.org.co/wp-content/uploads/2011/08/Pol%C3%ADtica-de-proveedores-del-sector-petrolero-Informe-Final-Ismocol-Nov-2012.pdf>.

sustainability.<sup>39</sup> It has developed a wide spectrum of policies ranging from citizen participation in environmental management, biodiversity management, development of the National System of Protected Areas, the Land Environmental System, and stimulus for cleaner production processes of the productive sectors, to specific policies for the ethnic groups that are part of the nation.

Tables considered relevant to this issue are presented from the Colombian technical guide to good social practices in the hydrocarbons sector, with international and national links highlighted.

There are other legislative elements that link and protect indigenous communities and their territories. The annex contains explanatory tables relating to legislative changes, decrees and laws.

Article 360 of the Constitution of Colombia defines the royalties arising from production of non-renewable resources. The Constitution also determines who will benefit from this production, achieving positive effects, both in resources and investment, not only in the sector but also in the areas where hydrocarbons are produced.

### *iii. Analysis of the effects in different areas*

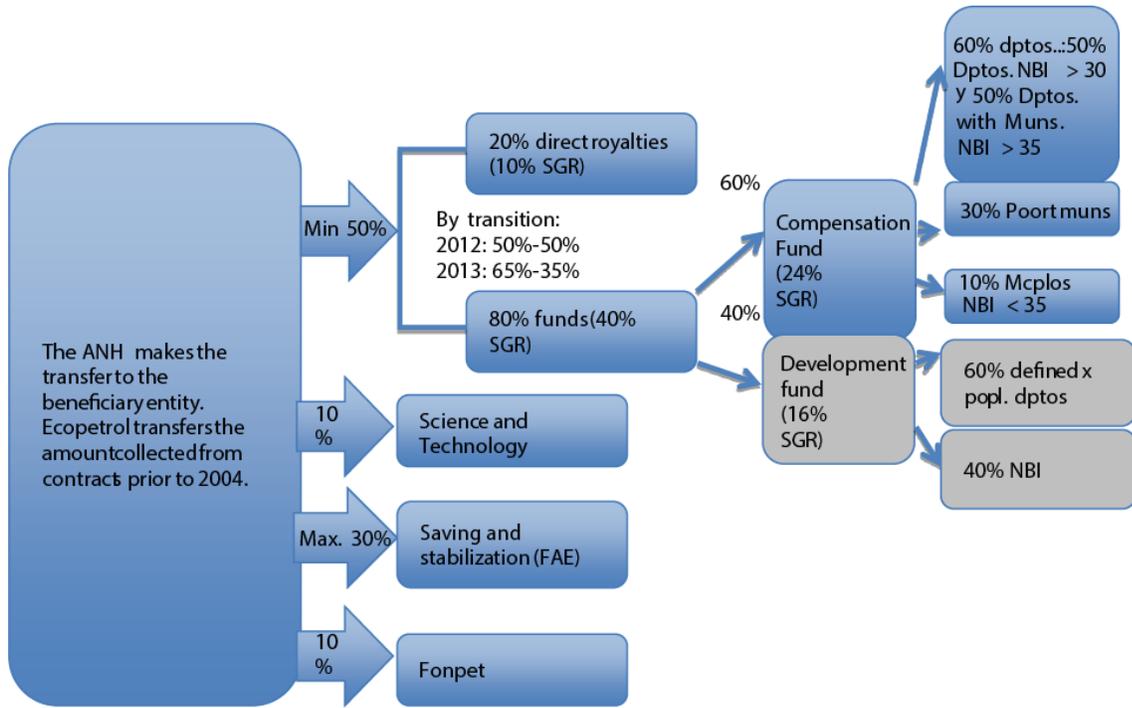
#### Production of hydrocarbon resources

As already mentioned, Article 360 of the Constitution of Colombia defines the royalties caused by production of non-renewable resources.

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<sup>39</sup> Based on the ILO Convention 169, the Declaration of Rio de Janeiro, the Convention on Biological Diversity, the Framework Convention on Climate Change, and regional agreements protecting the Caribbean and Pacific marine environment.

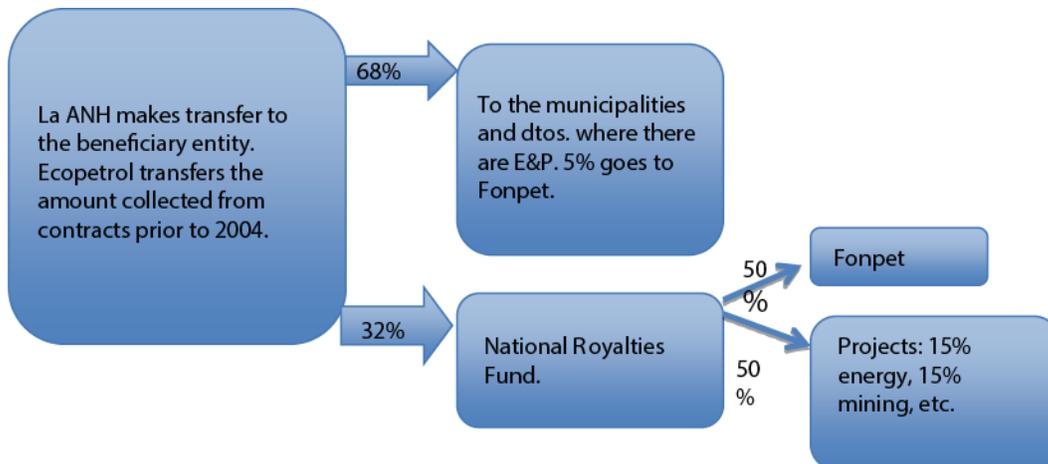
**Figure 11. Structure of royalty system**



Source: DNP, SGR, Law 1530 of 2013 and Legislative Law No. 5, Colombian Petroleum Agency..

\* The difference between total resources for SGR and those destined to the other funds and direct transfers. Between 2012-2014, 1/5 of FAE will go to royalties.

**Figure 12. Old royalty system**



Source: DNP, SGR, Law 1530 of 2013 and Legislative Law No. 5, Colombian Petroleum Agency.

The Constitution also determines who will benefit from this production, achieving positive effects, both of resources and investment, not only in the sector but in the areas where the hydrocarbons are produced.

**Table 17. Royalty beneficiaries of hydrocarbons**

<b>Who benefits from the royalties?</b>
<ul style="list-style-type: none"> <li>DEPARTMENTS AND MUNICIPALITIES where hydrocarbons are produced.</li> </ul>
<ul style="list-style-type: none"> <li>MUNICIPALITIES where the SEA AND RIVERS PORTS are located through which these resources and their products are TRANSPORTED.</li> </ul>
<ul style="list-style-type: none"> <li>INDIGENOUS RESERVES when hydrocarbons are produced AT NO MORE THAN 5 MILES from the reserves. These resources are managed and executed by the local or departmental governments where the reserve is located, in consultation with the indigenous authorities.</li> </ul>
<ul style="list-style-type: none"> <li>NON-PRODUCING DEPARTMENTS AND MUNICIPALITIES benefit from royalties through the National Royalties Fund.</li> </ul>
<ul style="list-style-type: none"> <li>DEPARTMENTS AND MUNICIPALITIES on the COAST UP TO 40 NAUTICAL MILES from the areas of hydrocarbon production.</li> </ul>
<ul style="list-style-type: none"> <li>Source: National Planning Department (DNP).</li> </ul>

#### Development of hydrocarbon-related sectors <sup>40</sup>

Although Colombia is not considered primarily an oil country, economic activity related to the sector has increased in recent years. Investments in refining and transportation began to stimulate sectors such as the oil and gas industry, and all activity linked to generation, transport and energy distribution. This increase in activity is also in response to the growing demand for mining services in Colombia.

In the hydrocarbons sector six main categories participate in the industry as shown in Table 18.

<sup>40</sup> See <http://www.fedesarrollo.org.co/wp-content/uploads/2011/08/Pol%C3%ADtica-de-proveedores-del-sector-petrolero-Informe-Final-Ismocol-Nov-2012.pdf>.

**Table 18. Segmentation of the oil services market**

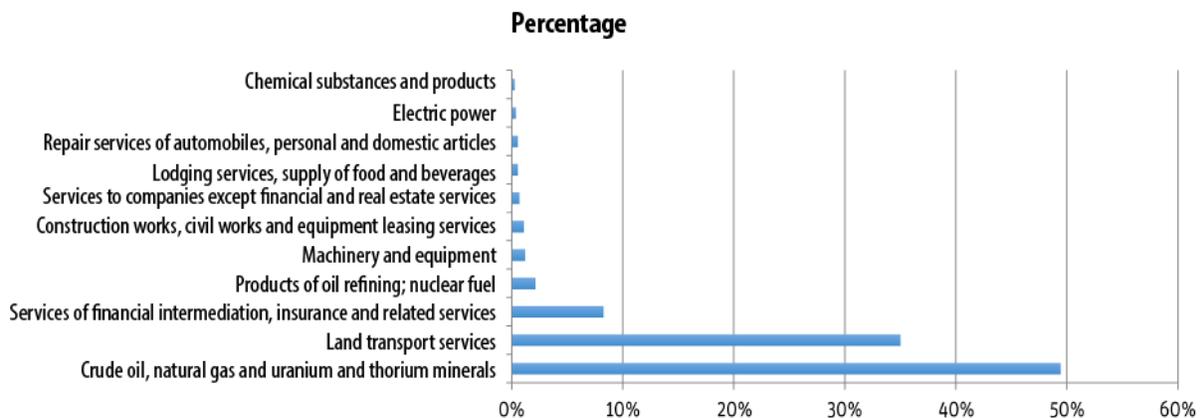
<b>Category by type of service</b>	<b>Market share</b>
Termination, rehabilitation and maintenance and/or other related drilling services.	22.9%
Manufacturing, marketing, distribution, rental and/or installation and maintenance of equipment, machinery, accessories and tools in general for the oil industry.	21.9%
Engineering services, consulting, advisory services, technical assistance and supervision.	14.3%
Services of geology, seismic, aerogravimetry, magnetometry and/or acquisition, processing and interpretation of information and logs.	6.9%
Design and construction of industrial assemblies, planning and execution of all types of works and/or infrastructure development in general.	4.8%
Other services (*)	29.2%
	<b>100%</b>

Source: Fedesarrollo (2011).

\* The category "other services" covers marketing of petroleum products, development of operations related to procurement and supply of vehicles for transportation of personnel and heavy equipment, as well as maintenance and management of camps, including general services, among others.

There is also a demand related to the sector which generates economic growth around it.

**Figure 13. Demand in the oil sector by sector**



Source. CCNN, Utilization matrix (2009).

### Employment levels

Hiring and labor policies give priority to local workers, taking into account local diversity and integration.<sup>41</sup> The oil industry in Colombia generates a significant number of jobs, both skilled and unskilled. In 2011, for example, 145 832 jobs were created<sup>42</sup> (58% skilled and 42% unskilled), in addition to the sector's investment in education, health, culture, recreation and sport, housing and environment, among other areas.

### Investment, GDP and others

Ecopetrol made investments of US\$18 billion, of which 53% corresponded to its exploration and production line. Exploration and transportation were the lines of service that grew most in share in the investment categories.<sup>43</sup> Foreign investment, according to the Colombian Petroleum Agency, declined 9% annually in 2013.<sup>44</sup>

#### *iv. Compared with the case of Mexico, specifically in certain benchmarks*

### Local content practices resulting from market forces

To create confidence among their employees, companies have used corporate social responsibility (CSR) tools, to find a social, environmental and economic dimensions in their business activity, highlighting business ethics, quality of working life, environmental and social performance and the value chain, always in pursuit of sustainable economic development.

The company translates CSR into the "set of practices, values and principles, which involve a commitment of the organization to behave ethically and contribute to the quality of life and development of its stakeholders."

Unlike the approach of Mexican legislation, which emphasizes local content much more, policies to promote greater social responsibility and sustainability, shared by company and government in Colombia, give effective results, although this can lead to weakness in the development of local and national industry<sup>45</sup>.

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<sup>41</sup> See <http://www.icontec.org/images/comite-238/proyecto-guia-tecnica-colombiana.pdf> .

<sup>42</sup> See [http://www.acp.com.co/images/pdf/petroleoygas/gestiosocial/Informe\\_gestion\\_social\\_ACP\\_2011.pdf](http://www.acp.com.co/images/pdf/petroleoygas/gestiosocial/Informe_gestion_social_ACP_2011.pdf).

<sup>43</sup> See <http://www.fedesarrollo.org.co/wp-content/uploads/2011/08/Pol%C3%ADtica-de-proveedores-del-sector-petrolero-Informe-Final-Ismocol-Nov-2012.pdf>.

<sup>44</sup> See [http://www.acp.com.co/images/pdf/petroleoygas/vae\\_para\\_web/Actividad%202013%20y%20perspectivas%20para%202014%20-junio2014.pdf](http://www.acp.com.co/images/pdf/petroleoygas/vae_para_web/Actividad%202013%20y%20perspectivas%20para%202014%20-junio2014.pdf).

<sup>45</sup> See <http://acartiagroup.com/home/GuiaSocializacionACP.pdf>

### Local content practices resulting from legislation/regulation

The National Hydrocarbons Agency (ANH) and the United Nations Development Programme (UNDP) have been working since November 2012 on the project "Strengthening the institutional capacity of the ANH for planning, monitoring and evaluation of Community Benefit Programs (PBC), implemented by the hydrocarbons sector."<sup>46</sup>

According to information from the ANH, there are three social projects benefiting development of local communities, listed here by objective: <sup>47</sup>

1. Strengthening the capacity for dialogue between State, indigenous peoples, Afro-Colombian communities, and communities in the areas of influence of hydrocarbon operations and projects.

**Table 19. Details of the project to strengthen capacity for dialogue**

Parties involved in the development project	<ol style="list-style-type: none"><li>1. National Hydrocarbons Agency (ANH)</li><li>2. Attorney General's Office (PGN)</li><li>3. Ecopetrol S.A</li></ol>
Purpose of the project	Jointly implement a program to strengthen the capacity for dialogue of State, indigenous peoples, Afro-Colombian communities and other communities located in the areas of influence of Ecopetrol and ANH projects.
Documents/Links for downloading	<ol style="list-style-type: none"><li>1. Guide to facilitate intercultural, inter-social and inter-institutional communication.</li><li>2. Link to Objective Colombia Radio Program: <a href="http://www.procuraduria.gov.co/html/objetivo_colombia.html">http://www.procuraduria.gov.co/html/objetivo_colombia.html</a>.</li></ol>

2. Give operative support to development of consultation processes prior to hydrocarbon exploration and production in the territories of indigenous and black communities.

<sup>46</sup> See <http://www.anh.gov.co/Seguridad-comunidades-y-medio-ambiente/PublishingImages/Paginas/Progr>.

<sup>47</sup> See <http://www.anh.gov.co/Seguridad-comunidades->.

**Table 20. Details of the project to support prior consultation processes**

Parties involved in the project	National Hydrocarbons Agency (ANH) Ministry of Interior and Justice (MIJ)
Purpose of the project	Support the Office of Ethnic Affairs of the Ministry of Interior and Justice in activities related to inter-institutional coordination of the consultation processes of hydrocarbon projects at all stages in the areas administered by the ANH, and verify the existence of indigenous or black communities, throughout national territory.
Documents/awaiting download	Website of the Office of Ethnic Affairs of the Ministry of Interior and Justice: <a href="http://www.mij.gov.co/pagina5.asp?cat-102">http://www.mij.gov.co/pagina5.asp?cat-102</a>  Report on prior consultation processes and verification of ethnic communities, developed in 2007.

3. Update and produce a map of areas of special regulation (indigenous reserves, black community lands, national parks, wetlands, and protective forest reserves and wilderness areas).

**Table 21. Details of the project of the map of special areas**

Parties involved in developing the project	National Hydrocarbons Agency (ANH) Agustín Codazzi Geographic Institute (IGAC)
Objective of the project	Implementing a Geographical Information System to update online, the cartographic base at 1:100,000 IGAC, areas of indigenous reserves and black community lands, as established in Decree 1320 of 1998; the areas of national natural parks, wetlands, forest and protected reserves and reserve areas, and develop a search application for the above information.
Documents/Links for download	Link of the Search System for Special Regulated Areas: <a href="http://sigotn.igac.gov.co/siganh/">http://sigotn.igac.gov.co/siganh/</a>

## Impact indicators

The Colombian Petroleum Association (ACP), in its second report on the social activity of the oil industry<sup>48</sup> of 2011, shows its performance in six main variables or indicators, as shown in Table 22.

**Table 22. Second report of social management of the oil industry, results for 2011**

<b>Variable-indicator</b>	<b>Values</b>	<b>Description</b>
Employment	145,832	Total employment generated by the hydrocarbon industry.
	85,000	Skilled jobs.
	60,000	Unskilled jobs.
	97%	Percentage of unskilled labor from the local area.
Social investment	\$ 241 million	In voluntary social investment.
	\$ 88 million	In compulsory social investment (contractual obligations).
Goods and services	\$ 37,000 million	Purchase of goods and services by operators.
	\$ 22,000 million	In national purchases.
	\$ 14,000 million	In local purchases.
Road Infrastructure	\$ 276 million	In construction and upgrading of roads.
Meetings and socialization	Average per oil project: 16 meetings with the community, 6 compulsory socialization and 10 voluntary meetings.	
Prior consultation	107 consultations	Consultation sessions before starting hydrocarbon exploration and production activities.

These practices, which have been developed in the hydrocarbon industry in Colombia, are a sign of the commitment and constant efforts made to create better conditions in the social and economic environment of oil operations, and to achieve sustainability over time.

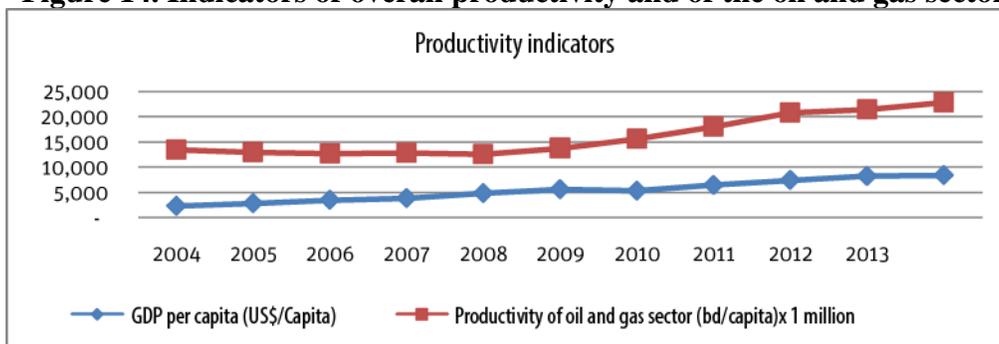
<sup>48</sup> See [http://www.acp.com.co/images/pdf/petroleoygas/gestiosocial/cuando\\_el\\_crudo\\_se\\_vuelve\\_desarrollo.pdf](http://www.acp.com.co/images/pdf/petroleoygas/gestiosocial/cuando_el_crudo_se_vuelve_desarrollo.pdf).

## v. Conclusions

The current national economic outlook is optimistic, thanks to the country's performance in 2013, which reaffirmed the importance of the hydrocarbons sector and its contribution of over Col\$18.000 billion in tax revenue, equivalent to about 12 % of the country's total.

On the impact on the economy of legislation and market forces related to the concepts of local content and development of productive corridors, even though these terms are not used, the results were good due to a culture of CSR and of good practices of relations and inclusion with neighboring communities and other stakeholders in the regions where the oil companies operate.<sup>49</sup>

**Figure 14. Indicators of overall productivity and of the oil and gas sector**



Source: US Energy Information Administration.

In summary, a corporate and government culture exists which favors sustainability, since actions are taken which benefit the communities, beyond contractual obligations, voluntarily arranged with the authorities and local inhabitants themselves, especially hiring of skilled and unskilled labor, purchase of goods and services from local and national suppliers, and investments in infrastructure.

### ***c. Case Study of Trinidad and Tobago: effects of state intervention on use of local content policy via policy/legislation/regulation***

#### ***i. Context of the hydrocarbons sector of Trinidad and Tobago***

##### **Brief history of the sector in the country**

The first commercial oil production in Trinidad and Tobago took place in 1908, with the establishment of Petrotrin, an oil company wholly owned by the State. By 1956 the multinationals Texaco (acquired

<sup>49</sup> See <http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=93&pid=44&aid=33&cid=CO,&syid=2000&eyid=2011&unit=MM>.

by Chevron in 2001) and British Petroleum (known as Amoco before 1998) were operating in the country. In 1962 the country declared its independence from the United Kingdom.

The economy of Trinidad and Tobago was led by oil during most of the 20th century. However, at the beginning of 21st century the country had the most resilient economy in English-speaking Caribbean, and was recognized as the first economy whose most important source of income is gas, in the aftermath of the financial crisis of 2008. This was exploited to the maximum by the country which became a major exporter of liquefied natural gas (LNG) and contributed to development of a national manufacturing platform.

However, in July 2008, after the financial crisis, oil and gas prices collapsed from their historical highs, resulting in a sharp decline in government revenues, particularly from the natural gas sector. More specifically, since 2000-2007, natural gas production and prices have steadily increased. This situation lasted until September 2008, when the crisis mentioned drastically reduced US demand.

#### Institutional framework and chronology

The Ministry of Energy and Energy Affairs is responsible for the overall management - supervision, control and regulation - of the oil, gas and mineral sector in Trinidad and Tobago, through a Permanent Secretary who oversees the different areas, each one with specific activities (Government of the Republic of Trinidad and Tobago, n/d):

- *Commercial evaluation*: contracts, licenses and establishment of agreements; economic, tax and business assessments.
- Contract management: exploration, relations with stakeholders, reporting of contracts.
- Export of gas and LNG: LNG / Petrochem / gas exports; Contract Management; Technical Management.
- *Resource* management: planning and exploration, Surface Management, Resource Management, subsurface analysis.
- Refining and sales management: monitoring, refining and retail market, taxation and subsidies, policies and strategies.
- Energy research and planning: analysis and research of energy trends; sustainable energy initiatives; international relations.
- Minerals division: minerals management.

In addition, there is the position of Deputy Permanent Secretary, who leads support groups, including: Accounts, Administration, Communications, Human Resources, Benefit Verification Unit, Internal Audit, Energy Infrastructure Security, Information Technology, Legal Unit.

#### Private participation in the market

The hydrocarbons sector market is a mix of public and private participation. In the exploration subsector, the companies vary in size: BP Trinidad and Tobago, BHP Billiton, the state-owned Petroleum Company of Trinidad and Tobago Limited (Petrotrin), Venture Limited Trinidad and some smaller ones.

With respect to the refining subsector, the state-owned Petrotrin owns a 160,000 bpd refinery, which exports mainly to the Caribbean and Central America and produces about 40% of the crude needed for its refinery.

In 2010, Trinidad and Tobago took direct control of approximately one third of the total assets of the oil industry in a capital investment. However, despite the important degree of private domestic investment in the period 1990-2010, most of the energy assets in the country were in the hands of international capital through private equity and secured debt, which have been attracted to Trinidad and Tobago by the phenomenal growth in the sector during the post-independence period.

Some facts about the Trinidad and Tobago oil sector are given below:<sup>50</sup>

- Most investment takes place in this sector.
- Growth and investment depend on exogenous factors.
- Opportunities for growth depend on international oil and gas prices and proven reserves.
- Potential for growth in the services sector is related to growth in the oil and petrochemical industries.

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<sup>50</sup> See [http://ngc.co.tt/wpcontent/uploads/pdf/NGC\\_Webinar\\_The%20Structure\\_History\\_and\\_Role\\_of\\_the\\_Natural\\_Gas\\_Industry\\_2013-08-22.pdf](http://ngc.co.tt/wpcontent/uploads/pdf/NGC_Webinar_The%20Structure_History_and_Role_of_the_Natural_Gas_Industry_2013-08-22.pdf).

## History of hydrocarbon production and oil and gas reserves in Trinidad and Tobago

Table 23 shows data on oil reserves in billions of barrels (BDB) and production in thousand barrels per day (BDP).

Gas reserves are presented in trillion cubic feet (TCF) and gas production in billions of cubic feet (BCF).

**Table 23. Statistics of crude and gas reserves and annual production in Trinidad and Tobago**

Year	Gas and crude reserves and production			
	Oil reserves (BDB)	Crude production (BPD)	Gas reserves (TPC)	Gas production (BPC)
2004	0.990	151	25.89	1,073
2005	0.990	171	25.89	1,175
2006	0.990	179	25.88	1,417
2007	0.728	157	18.77	1,476
2008	0.728	157	18.77	1,466
2009	0.728	153	18.77	1,515
2010	0.728	146	15.40	1,576
2011	0.728	138	14.42	1,507
2012	0.728	119	13.46	1,505
2013	0.728	118	13.26	N/D
2014	0.728	N/D	13.11	N/D

Source: EIA (n/d).

### Main challenges related to exploration and production

During this research it was found that the main challenges to hydrocarbon exploration in Trinidad and Tobago are:<sup>5152</sup>

<sup>51</sup> See [https://play.google.com/books/reader?id=W9k,BAAAQBAJ&printsec=frontcover&output=reader&hl=es\\_419](https://play.google.com/books/reader?id=W9k,BAAAQBAJ&printsec=frontcover&output=reader&hl=es_419).

<sup>52</sup> See [http://ngc.co.tt/wpcontent/uploads/pdf/NGC\\_Webinar\\_The%20Structure\\_History\\_and\\_Role\\_of\\_the\\_Natural\\_Gas\\_Industry\\_2013-08-22.pdf](http://ngc.co.tt/wpcontent/uploads/pdf/NGC_Webinar_The%20Structure_History_and_Role_of_the_Natural_Gas_Industry_2013-08-22.pdf).

- The country has a challenging geology.
- Seismic data is being reprocessed.
- There has been a significant increase in exploration activity.
- Investors feel attracted to the sources of "new gas" in deep water.
- Investors offered security on the existing market for any gas.
- Signing of new production sharing contracts.
- There are drilling initiatives in deep water.
- There is a need for new bidding processes for oil and gas exploration.
- An integrated sectorial plan is required that takes into account local content, use of domestic energy services, and exposure of nationals to new technologies, new management techniques and new skills.

The main challenges for hydrocarbon production in the country are as follows:

- The level of gas production is much higher than oil production, and the latter is steadily decreasing.
- There has been a process of maturing of oilfields which now face operational challenges.
- Falling gas reserves.
- In the Caribbean there is great competition for crude supplies, mainly the US market.
- Adding value to the existing petrochemical base.
- Bidding processes for specific projects.
- Emphasis on future links with local production.

## *ii. Local content legislation*

### Reasons for enactment or not of legislation/regulation

The Ministry of Energy and Energy Affairs is responsible for formulating regulatory policies on production, transmission, distribution and supply of hydrocarbons. Also, in accordance with the law, the ministry is determines the area available for oil operations. Similarly, the decision to open participation for exploration and production rights through public bidding processes is strictly for its consideration.

The hydrocarbons sector has been supervised, regulated and controlled for many years, particularly in areas such as health, safety, environmental aspects and protection for exploration and production, internal and external corporate and financial governance and compliance and security.

In general, the regulations issued cover environmental protection, free and fair competition, promotion of local (human) resources for exploration and production, improving existing infrastructure and development of new infrastructure, with the focus on new and modern technologies.

The intention is also to gain control over ownership, decision making and preferential access to financing for native participation.

#### Expected results or goals

- Facilitate commercial exploration and, consequently, develop the country's resources.
- Protection of the interests of consumers.
- Adoption of rules for market entry.
- Protection of interests of the owners of natural resources.
- Promotion of competition.
- Promotion of anti-dominant market practices.
- Promotion of continuity and quality among service providers.
- Environmental protection.

#### Review of literature, existing laws or regulations

In Trinidad and Tobago the hydrocarbons sector is mainly governed by the following laws and regulations and channels for local content policy:

- Petroleum Law (1969).
- Petroleum Regulations (1970).
- Petroleum Tax Law (1974).
- Fiscal Incentives Law.
- Foreign Investment Law.
- Unemployment Tax Law.
- Law on Taxes on Oil Production and Subsidies.

- Policy Framework for Local Content.
- Production Sharing Contracts.

In this respect, a license granted specifically by the Ministry is required under the Law and the Petroleum Regulations for natural gas distribution. Currently, gas is distributed through the Natural Gas Company (NGC) directly to customers, although NGC's operations are not subject to public service regulations.

In addition to laws and regulations, more recently the following entities were set up:

- Standing Committee on Local Content.
- Committee of Work Permits Council.
- Division of Energy and Planning Research.
- Energy Chamber of Trinidad and Tobago.

There are currently no guidelines for measuring local content, however, non-local contractors are encouraged to use, as far as reasonably possible, local contractors and suppliers and must submit certification with supporting documentation on materials, labor and other services used, subject to audit. Shared production contracts have no minimum margin of use of domestic content.

Operators are required to submit quarterly reports on their activities with local content to the Ministry of Energy. Training and development programs, which are promoted, must be approved by the Ministry of Energy and must submit a quarterly report to the ministry on the progress of the program.

### *iii. Analysis of the effects*<sup>53</sup>

General and/or secondary effects of the regulation include limitation of business competitiveness and inhibition of investment (in some aspects), containment of economic growth, growing unemployment, and increased cost of doing business.

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<sup>53</sup> This section is based on Jegede et al.(2013).

At this time, there is no framework of penalties for non-compliance with the local content policy in the plans proposed by contractors and approved by the Ministry of Energy and Energy Industries.

#### Production of hydrocarbon resources

During the bidding process, local content benefits through the following actions:

- Contracts must match to the best possible extent the capacities of local companies in terms of times, finance and human capacity.
- Contracts must be public to guarantee free and fair access, especially to local companies.
- The results of the award must be based on local content and be granted with reasonable preference in line with the qualification of suppliers that meet the requirements of quality, cost and delivery.
- Seismic processing work must be carried out in the country.
- The National Policy Guidelines for the Use of Domestic Goods and Services for government and government-related projects must be promoted.

#### Development of hydrocarbon-related sectors

- The recently published policy is less costly for companies focused on the hydrocarbons sector, with tax benefits, which cooperate with development and improvement of existing local infrastructure.
- This route has been identified as productive for related sectors.
- The power of economic recovery for companies in relation to worker training and education.
- The possibility of setting up local businesses, coupled with participation in the processes of policy development.
- The field development plan must include the percentage of local content that the operator plans to achieve.

### Employment levels

The new legal framework requires closer involvement by domestic actors, together with the requirement for international businesses to include local businesses in their operational processes.

The following positive effects were achieved (Wise & Shtylla, 2007):

- Development of competitive local suppliers by increasing the number of national workers and restricting the number of foreign workers.
- Reduction of costs through competitive local suppliers.
- Development and training of personnel, through mandates which in turn replace foreign workers by local workers.
- Establishment of procedures to prevent preference for foreign over local employees, when they have similar skills and for a simple transition of jobs to local employees in cases of existing foreign employees.
- Local economic development.
- Increased participation of (local) stakeholders.

### Investment, GDP and others

Due to the recently established policy, investment is now more interested in the country and in this particular sector, because Trinidad and Tobago has become one of the most important centers of development, mainly of natural gas in the world.

Effects have also been noted in the area of education, following development of training programs with government support, including the expanded geoscience program of the University of the West Indies (UWI) and creation of the National Energy Skills Centre (NESC).

**Table 24. GDP of Trinidad and Tobago, oil and non-oil industries**

(millions of US dollars)					
Year	2009	2010	2011	2012	2013
Oil industry	41,965.5	56,015.3	70,313.7	62,140.3	64,887.5
Non-oil industry	79,628.1	74,962.9	81,377.6	86,639.3	91,688.6

The various types of incentives available have a general impact on the economy, especially the following:

- Investment incentives, including subsidies for training, insurance and tax exemptions.
- Fiscal Incentives Law, which includes tax benefits for manufacturing products approved by certified companies.
- Income Tax Law, which benefits certain companies with a 15% tax credit against the normal 35%.
- Exemptions from customs duties in construction of approved projects, only available to local businesses.

*iv. Comparison with the Mexico case, specifically in certain benchmarks*

Local content practices result of market forces

Trinidad and Tobago is one of the world's most important and fastest growing gas producers, which has transformed the country to supply above all the US market. To a lesser extent, it is the main hydrocarbon distributor for Caribbean countries and some others, from time to time.

In addition, British Petroleum Trinidad and Tobago (BPTT) succeeded, inter alia, in setting up joint ventures between local and foreign firms, taking advantage of the benefits in the medium term for investments in strategic areas. These joint ventures offer the possibility of incorporating more modern foreign technologies into approved and future projects.

Also, as more intense support for local content policies, works were eliminated which did not take into consideration supplies of goods in permanent installation (civil works and technical services).

In the case of Mexico, historically the country has maintained these sectors exclusively under State control, and it has only been since the recent energy opening (through the Energy Reform of December 2013) that – in the medium term - a more notable effect has begun to be seen with respect to market forces and their impact on local content practices.

However, local content policy has always existed, as in the case of Trinidad and Tobago, with objectives such as developing and improving training programs, as well as promoting participation of SMEs in the projects of Petróleos Mexicanos (Pemex).

#### Local content practices result of legislation/regulation

In the case of Mexico:

- Establishment of efficient contracts.
- Authorization for participation of private companies in all the value chain, particularly exploration.
- Authorization of permits for participation of private companies in hydrocarbon refining, transportation, storage and distribution.
- Ownership of all resources remains in hands of the State.
- Prohibition on concessions.
- Elimination of basic petrochemicals in the strategic areas of the State.
- Permission for natural gas processing, oil refining, transportation, storage, distribution and marketing of hydrocarbons and their products by private and public bodies.
- Establishment of a more flexible fiscal regime for Pemex, comparable with that of the oil companies of other countries.

In the case of Trinidad and Tobago, local content practices have attracted investment through tax and financial incentives designed to encourage private companies to contribute more local development and training, promote the use of domestic (human) resources, attract new technologies, etc., with no penalties for failure to comply with local content, while these companies continue to benefit the country.

#### Impact indicators

The expected benefits, in the case of Mexico, include the following:

- Restitution rates of reserves over 100%.
- Increase in oil production to 3 million barrels a day by 2018 and 3.5 million by 2025.
- Increased natural gas production to 8.000 billion cubic feet per day by 2018 and 10.400 billion by 2025.

*v. Effects of free trade agreements with impact on local content practices*

According to the Ministry of Energy and Energy Affairs of Trinidad and Tobago, the bilateral treaty with the United States on Promotion and Reciprocal Protection of Investments requires a partial renegotiation to be consistent with local content policies.

The country is also party to another treaty with the countries of the Caribbean Community (Caricom) which also differs with the local content policies, since it requires the inclusion of Caricom citizens as part of local content.

The country has been a member of the World Trade Organization (WTO) since March 1995 and grants all its trading partners Most Favored Nation Treatment (MFN).

*vi. Conclusions*

The case of Trinidad and Tobago is a good example of the consistency that can be created with the need to exploit a country's own natural resources, always in keeping with its history and without neglecting its own national interests.

There is a general awareness by the oil companies of the strong contrast between the capital ratios of their operations and that of communities – often rural and disadvantaged - where the oil is extracted and processed. Whether these opposing interests clash or line up depends on the quality of communication.

The new tax incentives in Trinidad and Tobago should make the development of small oil and gas fields on the island more profitable. There is the expectation that drilling activity is steadily rising and the positive price of the shares is continuing its momentum.<sup>54</sup>

With respect to the tax regime of Trinidad and Tobago, a change was expected which was finally legalized and which includes, as already mentioned, measures in favor of recovery of costs,

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<sup>54</sup> See [https://play.google.com/books/reader2?id=W9kBAAQBAJ&printsec=frontcover&output=reader&hl=es\\_419](https://play.google.com/books/reader2?id=W9kBAAQBAJ&printsec=frontcover&output=reader&hl=es_419) .

reduction of taxes on exploration and development, designed to reward companies seeking to increase onshore oil production.

Moreover, case by case, reductions in royalty rates have been successfully negotiated, along with reurbanization of the main onshore oil fields previously operated by Texaco and Petrotrin.

The increase in oil prices, technological advances and proposed changes to the tax regime of Trinidad and Tobago have revived the interest of oil executives in onshore deposits which had been abandoned during the last 40 years.

There is no direct data on how local content policies have benefited the country. However, the government and international actors are generally aware of efforts to increase capacity to monitor and measure implementation of policies.

The challenges to be overcome include the need to improve the quality of local products and services, and implement new local content policies which not only include the private sector but also involve the public sector more.

#### ***d. Indonesia Case Study: effects of state intervention on use of local content via policy/legislation/regulation***

##### *i. Context of the hydrocarbons sector*

During the 1960s an institutional structure for exploiting the country's oil wealth began to be developed. At the beginning of that decade, Oil & Gas Law Num.44 was issued, and in 1968 the parastatal Pertamina was established to consolidate management and control all activities in the sector (from exploration to sale of petroleum products). However, since Law No.8 of 1971, the company's field of responsibility has been reduced to onshore oil activities.

More recently, following Indonesia's membership of the World Trade Organization (WTO) in 1995, and even with the restrictions imposed by the agreement, a total reorganization of the sector was required. In 2001 Pertamina became a company with more limited capacities shared between state and private participation.

Offshore works were contracted to SKK Migas, whose corporate characteristics are not very clear; in fact, the military term *Special Task Force for upstream oil and gas business activities* was applied.

Very promising gas reserves are located onshore or offshore near the coast, so these changes were made in response to the negative trend in reserves, mainly oil. This is a great

challenge which will be addressed by increasing reserves by recovering deposits already exploited and deepwater exploration.

On the downstream side, the priority is to modernize refineries operated by Pertamina and open new ones.

The report on the quantitative development of the hydrocarbons sector in Indonesia is sufficiently clear, as shown by Table 25 which contains context information on the sector, namely current and historical hydrocarbon production levels (last decade ), and crude and gas potential and reserves.

**Table 25. Hydrocarbons sector in Indonesia, 2002-2012**

<b>Indicator</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Crude production	456	419	401	386	367	348	358	346	345	329	315
Crude reserves	9.75	9.13	8.61	8.63	8.93	8.40	8.22	8.00	7.76	7.73	7.41
Gas production	3.04	3.15	3.00	2.98	2.95	2.80	2.88	3.06	3.41	3.26	3.17
Gas reserves	177	178	188	186	187	165	170	160	157	153	151

Source: Ministry of Energy and Mineral Resources, Republic of Indonesia (2014).

Note: Crude production is in thousands of barrels per day and reserves in billions of barrels; gas production in million cubic feet and gas reserves in trillions of cubic feet.

Both crude and gas reserves are clearly declining. Crude production contracted dramatically over the decade and gas was almost stagnant, although this took place after recovery from a minor downturn.

#### Institutional structure of the sector

The information available on this subject is very limited, and the information actually available is outdated or is only available in the Indonesian language.

However, there is a National Energy Council with strong leadership from the Presidency of the Republic, set up in 2007, which has established the overall strategies and policies of the sector. The Ministry of Energy and Mineral Resources is responsible for overseeing compliance with the overall strategies issued by the Council, and a conglomerate known as SKK Migas (whose corporate structure is unclear) operates the entire offshore exploration and production subsector.

The organization is the result of the legal reforms already announced.

A series of initiatives have been implemented to slow the fall in oil reserves, including incentives for recovery of mature fields, deepwater exploration and offering of new fields in unexplored areas.

The E&P segment is dominated by international oil companies like Exxon Mobil, Petro China, BP, Total, among others, which establish contracts with shared production percentages, awarded by bidding.

It is clear that in the current situation exploration faces a serious challenge since, at the current rate of extraction, existing reserves will be exhausted within 10 years. Crude production is possibly reaching levels that can only meet domestic demand.

#### *ii. Local content legislation*<sup>55</sup>

While Indonesia has experienced excellent rates of economic growth (6.4% of GDP in 2013), its economic and social system suffers from major imbalances and gaps in care for the population (poor health infrastructure and education, poor employment growth and inadequate public services). If the social problems are not addressed, this could make the progress that the global economic figures seem to promise unviable.

Consequently, the WTO accession agreements made exceptions that stimulated the rest of the economy by increasing local content in oil activities and in industries that provide goods and services to this activity, coupled with making progress in human resources, science and technology, in order to achieve a competitive strengthening of the Indonesian economy in the medium term. With respect to strictly oil activity, the targets are detailed Table 26.

The document "Finance & Projects Jakarta" (Baker & McKenzie, n/d) mentions among the reasons for establishing local content legislation that of promoting national products, as well as appropriation of technology, all in relation to upstream.

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<sup>55</sup> This section is based on Tordo et al. (2013).

**Table 26. New objectives of the oil industry in Indonesia**

<b>Activity</b>	<b>Current goal</b>	<b>New Target</b>	<b>Implementation period</b>
Drilling	35% (onshore)	70% (onshore)	After 2016
	35% (offshore)	45% (offshore)	
Offshore facilities	35%	45%	After 2016
Naval services	35%	75%	After 2013
Geological and seismic studies	35% (onshore)	90% (onshore)	After 2020
	35% (offshore)	35% (offshore)	
Other services	35%	75%	After 2020

Source: Baker & McKenzie (n/d).

The document mentions as companies directly involved, the construction companies KKKS and PT *Pertaminas* itself, which is the general Indonesian hydrocarbon company, and other companies, almost all para-state.

Based on the targets of increasing local content, the following is achieved:

- Increase in national workers and restriction on foreign workers.
- Commitment of companies to promote training.
- Preference for domestic suppliers.
- Local content targets based on minimum percentages.

The Indonesian State will use:

- Licensing.
- Incentives and penalties.
- Creation of measuring and monitoring institutions.

It is important to mention that these measures are driven by legislation, but that they are likely to generate a not necessarily favorable reaction of market forces, reaction that can result in different effects from those desired.

*iii. Analysis of the effects in different areas*

Hydrocarbon production, development of industries in the sector and levels of employment and investment

Table 27 shows the trend in the energy sector in Indonesia from 2003-2013. The figures corresponding to primary production and final energy consumption, as well as the difference between the two items, expressed in thousands of BOE.

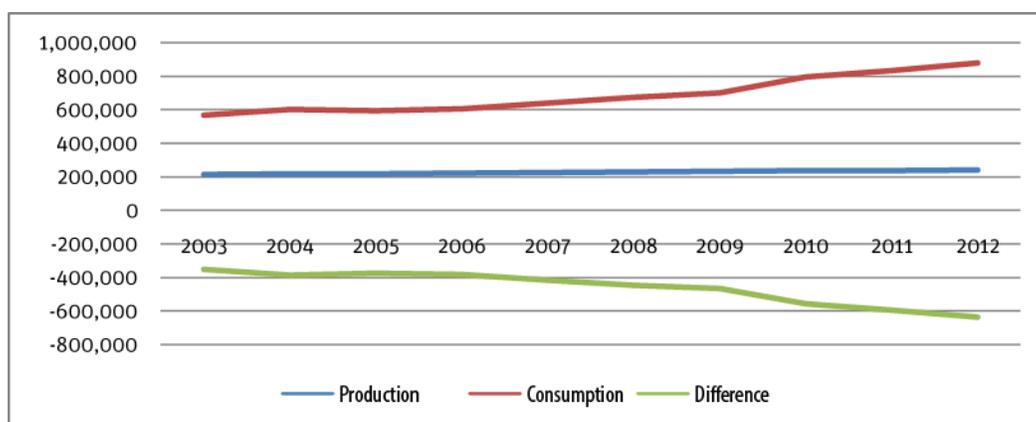
**Table 27. History of energy production and consumption in Indonesia**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Production	215,276	217,854	218,869	222,192	225,642	228,523	234,432	237,641	238,519	241,038
Consumption	567,774	603,496	594,558	603,882	641,594	674,720	699,210	793,929	834,721	878,343
Difference	-352,498	-385,642	-375,689	-381,690	-415,952	-446,197	-464,778	-556,288	-596,202	-637,305

Source: Ministry of Energy and Mineral Resources, Republic of Indonesia (2014).

The same table is presented as a line graph in Figure 15.

**Figure 15. Energy production and consumption in Indonesia**



The historical trend of energy consumption shows steady growth, while energy production remains practically constant, producing a negative energy difference or deficit. Figure 15 clearly shows the macro-level conditions that are obliging the Indonesian government to take corrective

actions to change these trends, and actions to increase production, as well as reduce consumption, which are now a national priority.

Consequently, the history of the energy sector, as well as hydrocarbon production, has a significant impact on the economic development of Indonesia.

Recently a key contract was signed, according to which the local company Apexindo, in partnership with France's Total, will install five large drilling rigs for US\$5.400 million, with a local content commitment of up to 76%, all in the Mahakam block where 110 wells were drilled in 2013.

Apart from promoting the use of local components for all upstream activity, there is also an obligation to use national banking services in procurement transactions for goods and services. This not only increases the provisions of national banks, but facilitates government review of many of the processes, including the obligation of contractors to place abandonment and site restoration funds in the banking system to guarantee environmental recovery.

Shared contracts between contractors operating in adjacent areas have been signed leading to significant savings.

Thus, given the maintenance of the levels of national and foreign investment in the sector, it appears that the rules have created a cumbersome bureaucracy, although there is a difference of opinion on the setting of monetary values imputable to local content

However most local businesses are SMEs which operate with basic technological levels and lack the industrial capacity and financial strength needed to be the dominant suppliers of the oil and national gas industry, and naturally for competing internationally .One important factor for promoting development of local industry is the complex regulation that limits partnerships with foreign companies that can transfer technology and strengthen the local industry.

#### *iv. Comparison with the Mexico case, with respect to certain items*

##### Spontaneous increase of local content or increase via legislation/regulation

The main contrasts between the Indonesian and Mexican cases relate to the temporal and structural factors of both companies and their economic bases.

It can also be inferred that such high requirements of local content policies and regulations that have been applied in Indonesia, although they have maintained a rising rate of production,

have not necessarily accompanied or driven development of national supply or the maturing of the local supplier industry for the oil and gas sector.

This symptom indicates that although strong legislation requiring compliance with national content can be effective in the short term, it can end up being a factor that prevents market forces from encouraging growth of local industry to strengthen it so that it can compete on similar conditions internationally.

In the Indonesian case, there has been little generation of externalities (spillovers), because many of the companies involved in the country are small, operate with very basic technologies and lack expansion and financing capabilities.

In contrast, Mexican energy policy dates from the 1930s and the energy companies (Pemex and CFE) implemented, as part of their strategic objectives, actions directly aimed at generating these externalities, both in selection of suppliers and contractors and in placing their production all over the country.

In the 1960s a policy of industrial development was launched, particularly automotive which was explicitly justified by the convenience of generating these effects in cascade, because the government had an oil revenue which encouraged it to invest in other sectors and clusters. In this case, these effects occurred more spontaneously (Gonher, Moresa, Bumex, etc.) and the policy was accompanied by gradual training of workers in different sectors.

The challenge for Mexico is primarily in acquisition of the technological capabilities required for current hydrocarbons sources. This must be done by exploiting the market opening and promoting partnerships with foreign companies to transfer technology for development of human capital, encouraging the rise of schools and universities specializing in advanced technology, promoting educational programs especially aimed at the sector and stimulating investment projects to create the manufacturing industry of tangible and intangible goods required by the E&P segment of the hydrocarbon industry.

## **E. Summary and final proposal of the study**

The results of this research study lead us to the following summary.

### *a. Summary*

- The legislation-regulation contained in the new provisions resulting from the reforms in the energy sector have the vocation of promoting the concepts of national content and development of productive corridors.
- The institutional framework formed with new agencies and the changes in the powers of existing ones create a suitable platform for implementing the mandates of the law for local content and productive corridors.
- Although all these changes have been taking place with this vocation, effective implementation of the mandates requires an inter-sectorial and inter-institutional coordination which poses important challenges to avoid getting in the way of effective operation.
- The exercise of bringing together the various sectors involved for discussion, analysis, and generating proposed solutions, with the creation of the Specialists Team, was interesting and enriching for all participants, opening the possibility of inviting other institutions and sectors which, because of their relevance and potential, can contribute greater added value, which leads to consideration of ways of giving continuity to the exercise.
- Case studies from other countries enriched the view with other scenarios where the strategies of national content and productive chains can have different results, so it is essential to take the specific conditions of each country into account.
- In all cases, as for Mexico, the principles of sustainability and formal attention to social and environmental issues are required for achieving the objectives the reform aims to achieve.

The final proposal of the study includes the following recommendations.

### *b. Final recommendations*

- The Energy Reform in the hydrocarbons sector and particularly in the exploration and production segment considers what would be known as "best practices" as observed in other countries, being for now the effective implementation of the proposed strategies,

and in this respect, the imminent need for a process of effective and flexible coordination and agreement between all the participating entities.

- The new discoveries from unconventional sources and technological development give a new lease of life to the era of hydrocarbon; however, the risks of undesirable impacts on the environment require strengthening of strategies and initiatives aimed at formal and deep development of clean energy sources through transition programs with immediate impact and long range.
- For the transition process that Mexico has to go through, with the new opening of the sector, attention must be paid to development of a new more aware and responsible business sector, which cares for and addresses the issue of sustainability with genuine social and ecological responsibility, as part of a strategy of re-industrialization of the country. Therefore an important recommendation is to consolidate the efforts and initiatives that are being developed in a uncoordinated way in order to concentrate on a Integrated National Program led by business in Mexico with the active participation of all sectors of the economy, with a clear focus on reducing poverty, benefitting from the growing wealth.
- The new experiences in Mexico are an important opportunity for saving efforts and expense in the work to be done; therefore, to recognize the different actors and promote their coordinated participation in the next steps needs serious consideration, as in the cases of Pemex, SE and SEP; chambers such as Canacindra, Canacero and CMIC; business organizations such as CDC and Coparmex; private research centers such as CEESP and IMCO, and public such as the IIEC of UNAM, IMP, Conacyt and INEGI; social sector organizations such as Mexico Sustentable, Ashoka and Fundemex; universities such as ITAM, IPADE, UNAM and SEP, international operators and many more, which have much to contribute.
- Finally, collecting the comments from the different stakeholders involved in this work, it is recommended that the possible alternatives be defined in order to give continuity to the exercise of the multisectoral Specialists Team, promoted by IDB, whose responsible participation and creativity, in an atmosphere of mutual respect and trust, helped achieve the results of this study and which, from now on, with emphasis on the

implementation stage we are initiating and which should be consolidated in the next few years, will contribute great value.

## **Annex: Results of the working sessions with the Team of Specialists from different sectors**

To enrich the content of the study, a participatory process was designed and implemented in which specialists on the issue of national content and development of productive corridors, along with representatives of institutions from different sectors, exchanged information and points of view, shared their perspectives in the process of analysis and finally contributed their findings and recommendations.

### ***a. Description of the process***

To proceed with the process of participatory work, the following steps were followed:

1. Selection of the sectors and institutions participating:
  - a. Government, with representation of the Ministry of Energy (SENER), Ministry of Economy (SE), Ministry of Finance and Public Credit (SHCP), and Petróleos Mexicanos (Pemex).
  - b. Private, with representation of the Business Coordinating Council (CCE), the Employers Confederation of the Mexican Republic (Coparmex), the Mexican Chamber of Industry and Construction (CMIC), the National Chamber of Transformation Industry (Canacintra), the Center for Economic Studies of the Private Sector (CEESP), the Mexican Institute for Competitiveness (IMCO), and Pricewaterhouse Coopers (PWC).
  - c. Academic, with the National Autonomous University of Mexico (UNAM) and the Autonomous Technological Institute of Mexico (ITAM).
  - d. Social, with Business Foundation in Mexico (Fundemex), Ashoka Mexico and Central America, and Mexico Sustainable Consortium.
  - e. Foreign operators, with representatives of Shell Mexico, British Petroleum Mexico, Exxon and Statoil.
2. Creation of a virtual space in the cloud with a shared file in Dropbox, named "BID Reforma Energética México 2014" and with a link <sup>56</sup> for collecting and sharing all the

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<sup>56</sup> See <https://www.dropbox.com/sh/2looz1lmsv85z8/AADc9L-kvk-zPb48hpcWSyPpa?dl=0>

information generated during development of the project.

3. Formation of the Specialists Team (ST) of representatives of each of the invited institutions.

Three working sessions were held with the following purposes:

**First session:** collect and share. The purpose was to level out as much as possible the knowledge of all participants on the subject. Each institution uploaded information to the Dropbox file and presented a summary of its contribution to all the Team, opening a space for questions and answers and exchange of views. At the end of this first meeting, a working guide was completed to prepare the information to be used in the second session.

**Second session:** FODA analysis. The purpose was to carry out a process of review and examination on three aspects:

- i. Short- and long-term objectives of the strategy to increase national content and develop productive corridors.
- ii. Legal, institutional and regulatory framework for energy reform, sectorial linkages, key goods and services for the sector, and the expected impact of the reforms on society and the environment.
- iii. Analysis of strengths and weaknesses as well as opportunities and threats.

During the second session the contributions of the participants were reviewed, and the short and long term objectives and the FODA analysis were refined.

At the end of the session, participants were asked to prepare their conclusions and recommendations for presentation and discussion at the third and final working session.

**Third session:** conclusions and recommendations.

The session began with presentation of the results of objectives, institutional and regulatory framework, and FODA analysis; the responses to each of the issues raised were examined.

The purpose of this last meeting was to consolidate the views of all participants on common issues, and above all to collect the conclusions, and make recommendations, proposals, strategic guidelines or initiatives and steps to be followed.

The process was very enriching; and participation was very open and dynamic. There was an atmosphere of respect and trust among all members of the ST who expressed and exchanged views.

In all the working sessions, the information generated by the members of ST was collected, which is now in the shared Dropbox file. The collection mechanisms were:

- i. Forms with questions, sent in Excel files by email.
- ii. Uploading information to the shared Dropbox file, open to all participants.
- iii. Written opinions of all those attending the session, using the keyboard system.
- iv. Audio recording during the working sessions.
- v. Summary of notes prepared by the observer in the sessions.
- vi. Reports of the results of each session were generated with:
  - Summary of opinions of the participants.
  - List of attendees.
  - Material provided by one of the specialists (open).
  - Photos of the sessions in the work area.

### ***b. Results of the 1st. Session: collecting and sharing***

Although participation was broad and widespread, not all the invited institutions uploaded the requested information to Dropbox so, in this first session, a significant part of the time was devoted to presentations by the participating institutions.

The meaning of the terms "local content vs. national content" and "component vs. content" was discussed, as well as the use and meaning of the terms "corridors vs. chains." It was agreed to use the terms contained in the law, which are: national content and productive chains, so that everyone was talking about the same thing.

Table A1 shows the names of the institutions and individuals which, in addition to attending the meeting, presented the content of the information shared in the Dropbox file. It is important to clarify that not all participants presented the information shared and not all the invited

institutions attended all the sessions; also representatives of foreign operators were not invited to the first session.

**Table A1. Institutions and individuals which uploaded the shared information to Dropbox**

<b>Representative, institution, function or position</b>	<b>Summary of message</b>
Eduardo Cruz Castro, international trade specialist in Canacintra.	<b>National content</b> applies to all productive state enterprises and all national and foreign private companies.
Gerardo Barsan, representative of the energy sector. Rafael López Torres, CMIC, Manager of the Energy Sector.	<b>The industry</b> has suppliers such as Pemex, CFE and individual contractors; the topic of national component makes no distinction.
Francisco Lelo de Larrea, CEESP.  Aims to create a good balance between competitiveness and national content.	<b>His proposals</b> focused on the tax side.  <b>Area of opportunity</b> , physical infrastructure of pipelines, gas pipelines etc.  <b>Seek a balance</b> to improve the competitiveness of Mexican companies without harming foreign investors.
Gerson Vega, responsible for national component in SENER. Sergio Hernández Pérez, SENER, operational efficiency and national content.	<b>Pending issues</b> to definition of the way to measure national content by the SE.  <b>Clear opening</b> to the inclusion and promotion of national industry.
Héctor Márquez, Head of Procurement Unit of SE. Calculation of national content	<b>Presented calculation formula</b> , including MO, training, infrastructure, technological development and possibly others.
Rafael Bouchaim, UNAM, Institute of Economic Research (IIEC), analysis of the reforms of the six-year period and development of the "input-output and social accounting matrix" model applied to Mexico.	<b>Presentation of input-output model</b> with 2008 data; pending update of data and level of detail.
Guillermo Abdel, ITAM, Director of the Center for Competitiveness of ITAM. Study how to stimulate mining thanks to the energy reform.	<b>Impact</b> of energy reform on the mining sector.  <b>Specific impacts in specific sectors.</b>  Needs and complementarities between sectors.
Pavel Valdéz, director of the Foundation for Sustainable Development, representative of Consortium Mexico. Sustainable. Issue of energy transition, promoters of social consultation.	<b>Need to consider the social impact</b> and community participation in a project, but mainly of self-consumption with clean energy.

**Table A1. Institutions and individuals which uploaded the shared information to Dropbox**

<b>Representative, institution, function or position</b>	<b>Summary of message</b>
Cybele Díaz, PEMEX	
Vanessa Guerrero, PEMEX	
Ricardo Mondragón, SENER	
Hugo Garduño, SHCP	
Juan Carlos Quiroz, IMCO	
Sergio Oceransky, ASHOKA/YANSA	
Juan Acra, COPARMEX	
Raúl Rivero, COPARMEX	
Karla Torres, SHELL	
Arlene García, STATOIL	
Alfredo García, British Petroleum	

The process of sharing the information provided by each participating institution resulted in achieving the objective of leveling knowledge on the subject between all participants.

After the first session, the form covering the topics shown in Tables A2, A3 and A4 was distributed to all guests of ST. With the answers from the participants in the ST, the material used in the second session was prepared, which is in the Dropbox file.

**Table A2. Questions on objectives**

#	Questions related to the Objectives of the National and Local Component and development of Productive Chains
<b>A</b>	<b>List the 3 most important <u>short-term</u> Objectives, which need to be achieved with an effective National Component (NC) and successful developments of Productive Chains (PC)</b>
1	
2	
3	

**Table A2. Questions on objectives**

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**B** List the 3 most important long-term Objectives, which need to be achieved with an effective National Component (NC) and successful developments of Productive Chains (PC)

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1

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2

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3

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**Table A3. Questions on policies, rules, sectorial linkages, key assets and social impact and environment**

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**Policies**

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Describe the Local Content (LC) policies that you identify in the Energy Reform?

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**Rules**

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What are the Rules referred to in the concept of LC and PC

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**Sectorial linkages**

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List the opportunities for National Sectorial Linkages which respond to the concepts of LC and PC

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**Key Assets (tangible and intangible)**

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What are the key tangible and intangible assets, for coordination between the energy sector and other sectors?

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**Table A3. Questions on policies, rules, sectorial linkages,  
key assets and social impact and environment**

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**Impact on Society and the Environment**

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Describe how the new legislation requires or suggests a positive impact on Society and the Environment

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**Table A4. FODA Analysis**

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**Strengths (internal, and those we must exploit and increase)**

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List the 5 main strengths we have to ensure achievement of the objectives.

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**Weaknesses (internal, and those we must eliminate or correct)**

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List the 5 main weaknesses we have to reduce to ensure achievement of the objectives.

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**Opportunities (external, environment, only those we can exploit)**

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List the 5 most important opportunities we must exploit.

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**Threats (external, environment, we can only defend ourselves or try to counteract them)**

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List the 5 most important threats, against which we have to prepare.

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The forms were collected, consolidated and analyzed before the second session, in which the responses were reviewed and refined with the participation of the members of the ST.

**c. Results of the 2nd. Session: FODA analysis**

The session began with the presentation of the hypothetical "Tlálloc" case developed by the representative of BP, illustrating the typical stages of an E&P a project in the deep waters of the Gulf of Mexico, an example which was very useful for focusing attention on the goods and services and investment amounts.

The second session was more dynamic with exchange of views; working sub-groups were formed to review the topics and refine the views contributed on the forms completed before the session.

Next, the results of the opinions (number of occurrences) of participants to each question were presented.

Question: *What is the value contributed by the hypothetical Tlálloc case to the project?*

**Figure A1. Value of the hypothetical Tlálloc case for the project**

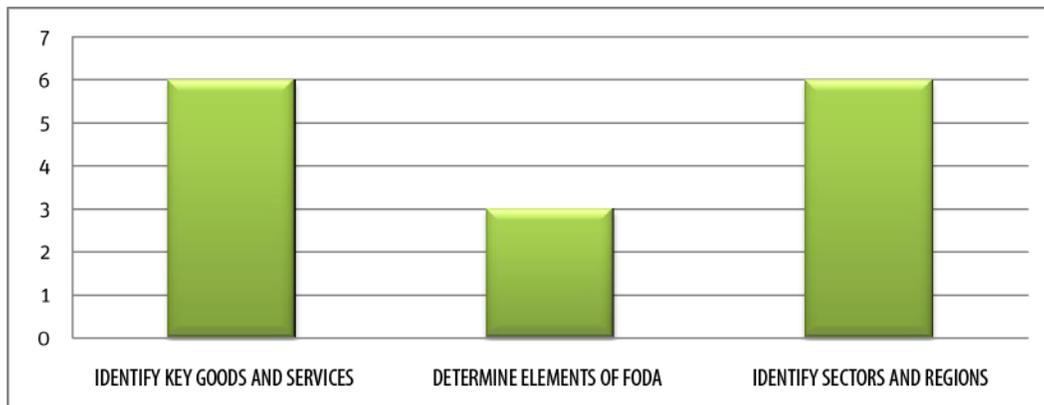
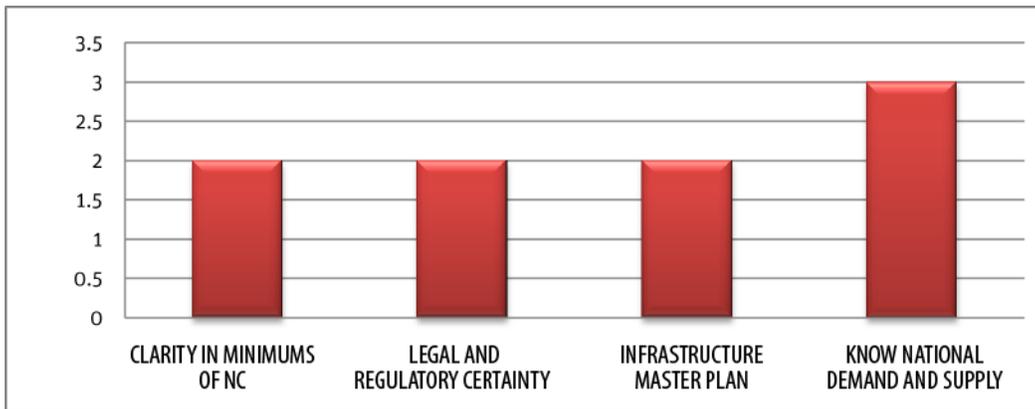


Figure A1 shows that six participants felt that the value of the hypothetical Tlálloc case was to identify key goods and services, as well as sectors and regions, while three felt that it determined elements of FODA.

Question: *List the three most important short-term objectives for promoting National Content (NC) and development of Productive Corridors (PC).*

**Figure A2. Short term objectives for NC and PC**



According to Figure A2, three participants felt that the most important short-term objective, as a condition for promoting NC and PC, was to know demand and national supply, while two views were for clarity on NC minimums, legal and regulatory certainty, and having an infrastructure master plan.

Question: *List the three most important long-term objectives for promoting the concepts of NC and PC.*

**Figure A3. Long-term objectives of NC and PC**

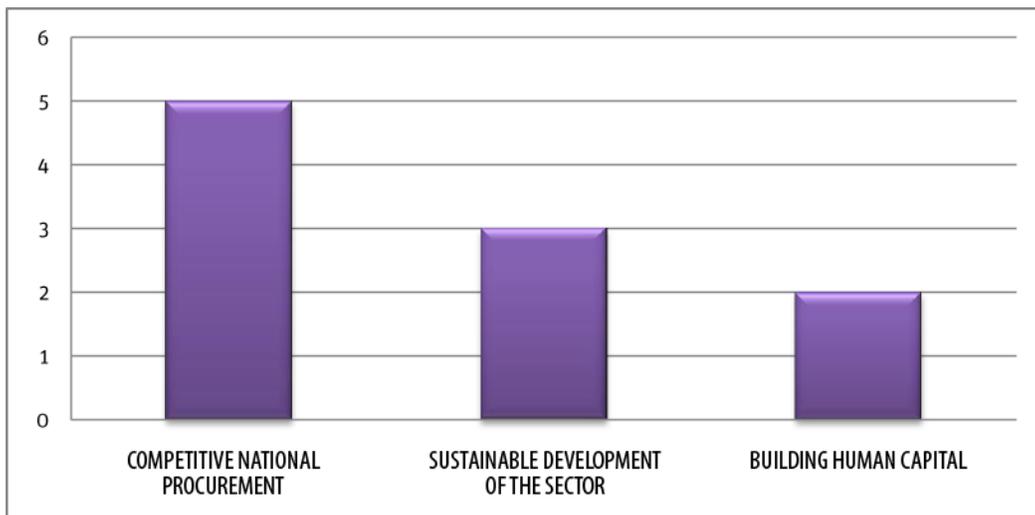


Figure A3 shows that five of the participants felt that having competitive national procurement was one of the most important objectives, while three considered sustainable

development of the sector as a long term objective and two saw human capital development as a fundamental objective.

Question: *What are the most important strengths we have for promoting the concepts of NP and PC?*

**Figure A4. Most important strengths**

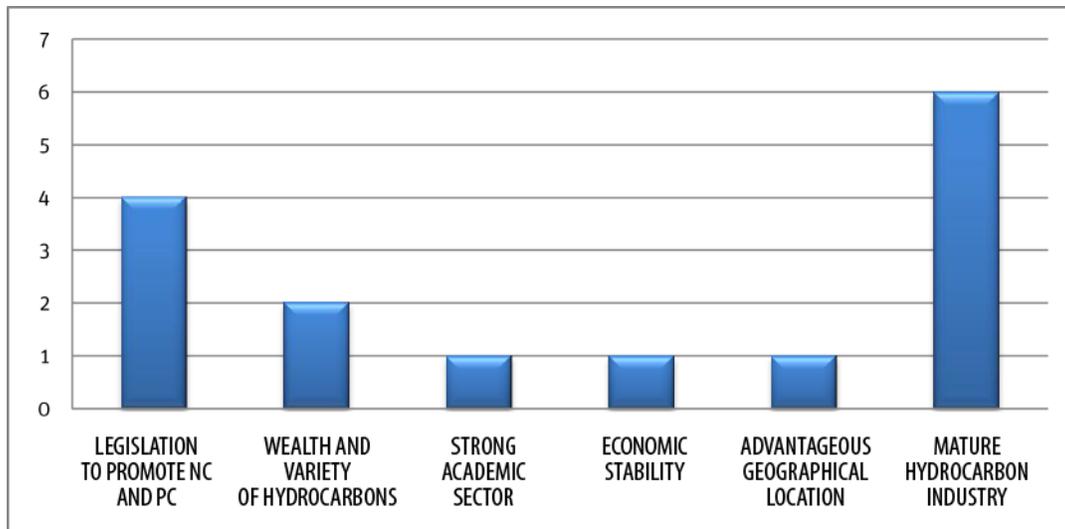
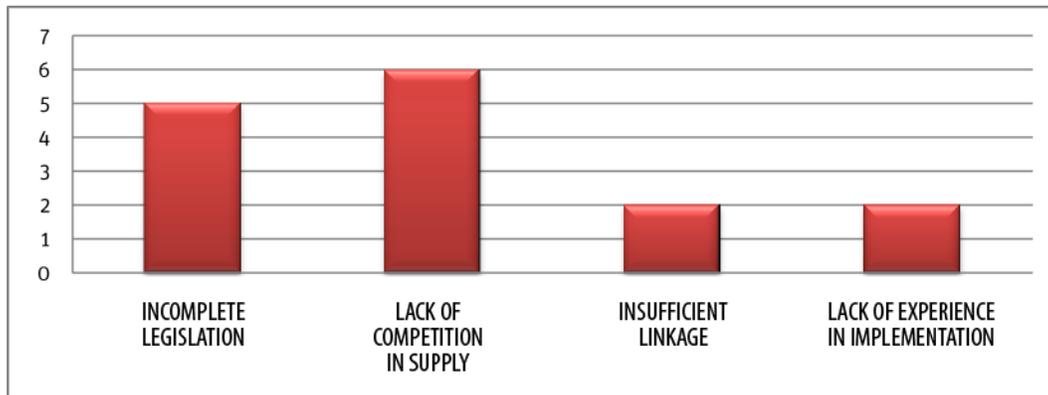


Figure A4 shows how six participants consider that having a mature hydrocarbon industry is a very important strength; four say that the most important is legislation promoting NC and PC, two think that the wealth and variety of hydrocarbons is a strength, and one opinion favors academia, along with economic stability and geographical location as key strengths.

Question: *What are the most important weaknesses we have for promoting the concepts of NC and PC?*

**Figure A5. Most important weaknesses**



Based on the results presented in Figure A5, six people felt that the lack of competitiveness in supply was one of the most significant weaknesses, followed by incomplete legislation (five opinions), and insufficient linkages (two opinions), along with little experience in implementing this type of reform in the sector in Mexico.

Question: *What are the main opportunities offered by the new energy reform for the concepts of NC and PC?*

**Figure A6. Most important opportunities**

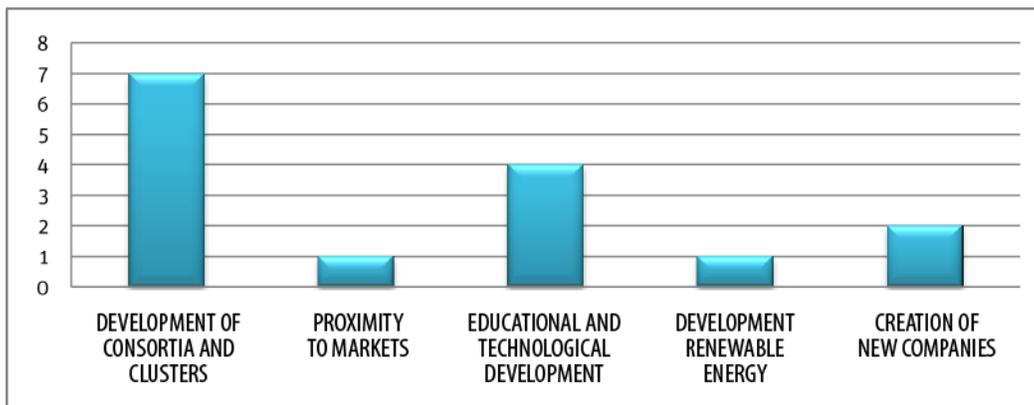
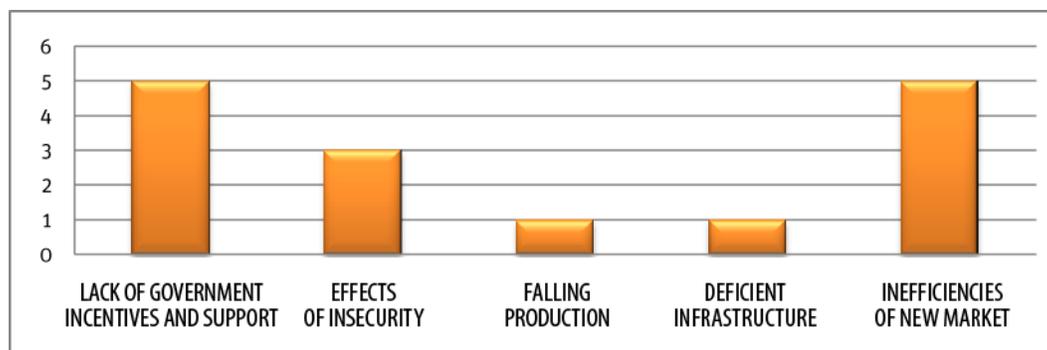


Figure A6 shows that most participants considered that the most important opportunity was to develop partnerships and clusters, while four thought it was educational and technological development; two opinions referred to creation of new businesses and one opinion to exploiting proximity to markets and development of renewable energies.

Question: *What are the main threats to the new energy reform for the concepts of NC and PC?*

**Figure A7. Most important threats**



In relation to the most important threats, Figure A7 shows there are five opinions opting for lack of incentives and government support, as well as new market inefficiencies, while four opinions go for the effects of insecurity and two on the possible fall in production, and inadequate infrastructure.

With respect to policies, rules and sectorial linkages related to NP and PC, the answers of ST members were categorized into various groups, with their respective rates of incidence.

On policies relating to NC and PC, the instruction was: *Describe the Local Content (LC) policies that you identify in the Energy Reform.*

**Table A5. Opinions on policies related to NC and PC**

Limited percentage targets of NC	5	25% and 35% targets, excluding unconventional E&P, but fixing LC on all projects.
Consultative Council	3	Headed by SE, with the participation of business and academic sectors to set policies and strategies for development of the industry and LC and PC.
Ministry of Energy responsibility	3	The Ministry defines, promotes and monitors the concepts of LC and PC and is a member of the Consultative Council and the Special Unit.
More elements in the calculation of NC	3	Goods and services, national manpower, training, investment in physical infrastructure and technology transfer.

**Table A5. Opinions on policies related to NC and PC**

Supplier development	3	Trust for development of national suppliers and contractors in the energy industry.
Pemex market opening	1	Participation of EPEs (Pemex y CFE) alone or in partnership with national or foreign private companies in projects.

According to Table A5, five of the participants answered that NC percentage policies are limited since they are only assigned values for conventional E&P projects.

Table A6 presents the answers in relation to the rules on NC and PC, when asked *What are the rules relating to the concept of LC and PC?*

**Table A6. Opinions on the rules on NC and PC**

More elements in the LC	2	Article 46. The methodology for measuring local content in assignments and contracts for E&P.
Minimum LC for E&P	4	Article 46. E&P activities must achieve a minimum of 35% local content.
More oversight of LC	2	Article 125. The Ministry must monitor the progress of the strategies mentioned in this article.
Calculation formula of LC	1	Transitory Articles 18 and 24 of the Hydrocarbons Law; maximum (90 days) for the Ministry to publish the methodology for measuring LC.

Table A6 refers to articles which specify the rules. The article on minimum LC for E&P has four mentions, rules that include more elements in the calculation of LC score 2, as does increased oversight of compliance, and one mention for the transitory article of 90 days to publish the new calculation formula.

However, Table A7 presents opinions on national sectorial linkages with development potential in the hydrocarbon industry, in response to the instruction: List the opportunities of National Sectorial Linkages that respond to the concepts of LC and PC.

**Table A7. Main linkages with national sectors**

Manufacturing and construction	5	Construction of platforms, underwater equipment, ships, helicopters, offshore facilities, valves, pumps, measuring instruments, ports, warehouses.
Multi-sector activities	3	Universities and training centers, spaces for outreach activities and consultation, forums, conferences, exhibitions, events.
Service workers	3	Living quarters, transportation, restaurants, hotels, commerce in general, religious services, recreation areas, parks, shopping centers.
Engineering services	2	Seismic studies, architectural and civil engineering projects, hydraulic engineering, electromechanical and electronic engineering.
Mining, smelting and processing	2	Exploration, extraction, processing, transportation, smelting furnaces, scrap, specialized transportation, yards, warehouses.
Wells and pipelines	2	Well drilling, well maintenance, pipeline construction, valves, supports.

Five respondents believe that manufacturing and construction is one of the main sectorial linkages, while three felt that multisectoral activities and personal services were priority, while two opinions selected the sectors of engineering, mining, smelting and transportation, and wells and pipelines.

With respect to the list of key tangible and intangible assets, the answers to the question *What are the key tangible and intangible assets for coordination between the energy and other sectors?* are presented in Table A8.

**Table A8. Key tangible and intangible assets for the sector**

<b>Tangibles</b>	<b>Intangibles</b>
Steel and cement	Specialized technical assistance
Underwater equipment, ships and helicopters	Training
Financial products	Dissemination and information
Pipelines, ports, roads	Skilled workers
Metal structures	R&D

**Table A8. Key tangible and intangible assets for the sector**

<b>Tangibles</b>	<b>Intangibles</b>
Generators	Transport
Drilling rig	Municipal services
Transportation and storage	Entertainment

Lastly, regarding social impact and the environment, participants were asked to Describe how the new legislation requires or suggests a positive impact on society and the environment.

**Table A9. Impacts on society and the environment**

<b>Impacts on society and the environment of:</b>	
<b>Concept</b>	<b>Institution/Medium</b>
Oil revenues	FONDO MEXICANO DEL PETRÓLEO
Prior free, and informed consultation	SEMARNAT-ANSIPA
Social impact assessment	ANSIPA
Regulation of surface occupation	ANSIPA
Best energy prices	Increased competition

The concepts that can have a positive impact on society and the environment as a result of the requirement or suggestions of the new legislation proved to be oil revenues; free, prior and informed consultation; social impact assessment; regulation of surface occupation and the best energy prices.

With these results, shared and analyzed by the ST, in this second session, participants now prepare their conclusions and recommendations for presentation, discussion and agreement at the third and final session.

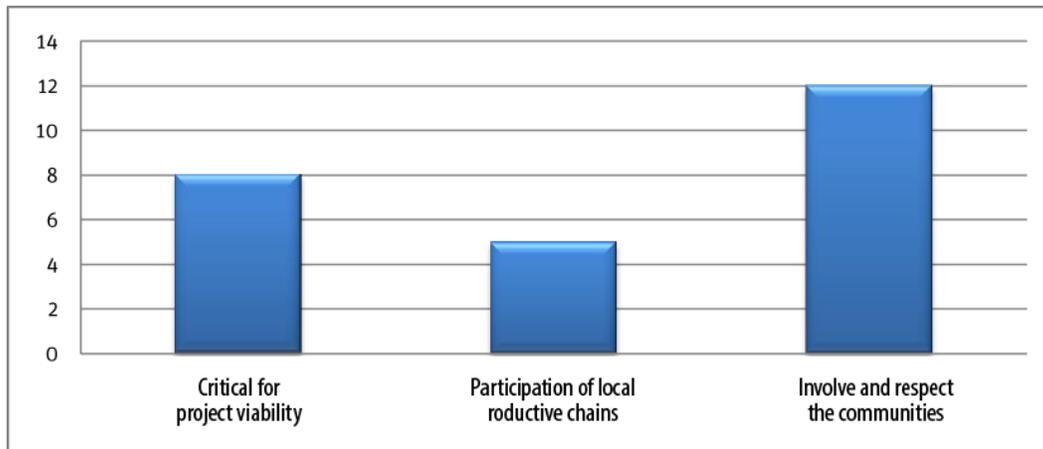
***d. Results of the 3rd. Session: conclusions and recommendations***

The third session began with the presentation of the social impact (SI) experienced in different communities as a consequence of energy generation projects of various kinds, particularly clean energy, but which can be taken as case studies for consideration in our project.

The ST worked in this session by forming small discussion groups, whose members were changed in each question. The questions were:

1. What value does presentation of social impact (IS) contribute to our study? Figure A8 shows the responses of the ST.

**Figure A8. Value of social impact in projects**

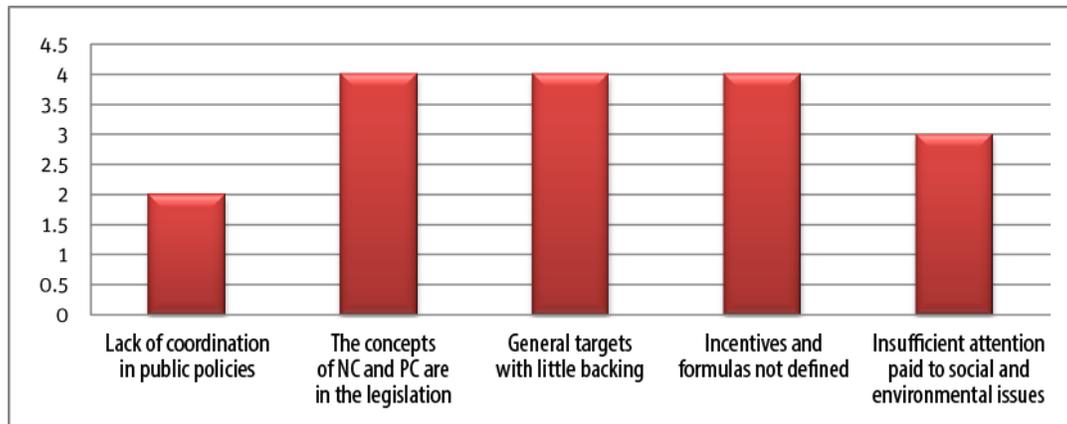


The majority (12 participants) recommend involving and respecting the communities affected by projects, eight consider that social impact is fundamental to the viability of the project, while five stressed the importance of the participation of local production chains in the projects.

***e. Conclusions***

The conclusions arising from the analysis of existing legislation on NC and PC, and in response to the instruction *Choose five conclusions on the topics of NC and PC consequence of the reforms,* are presented in Figure A9

**Figure A9. Conclusions of the legislation and its impact on NC and PC**



The conclusions reached by the ST participants on the legislation and its impact on NC and PC are summarized below.

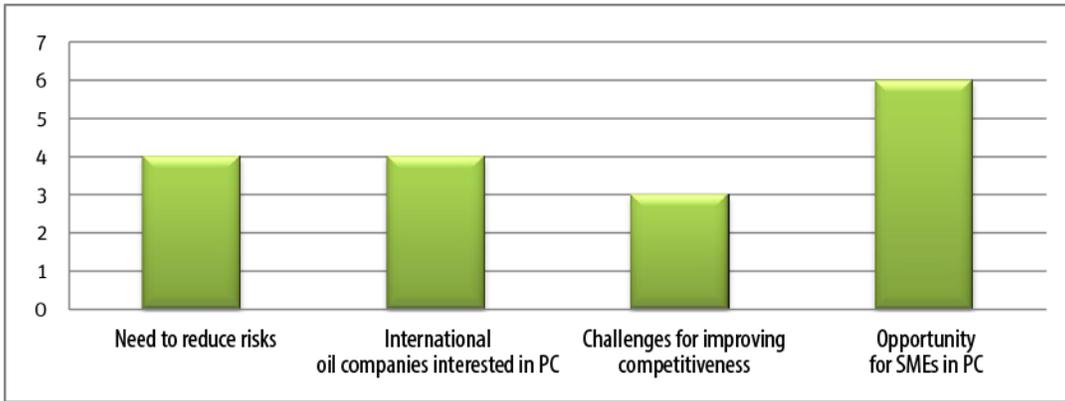
Four participants confirm that the concepts of NC and PC are in the laws; also general goals with little backing and incentives and the undefined formulas also appear with four mentions; the scant attention paid to social and environmental issues get three mentions, and lack of coordinated public policies gets two mentions.

These responses demonstrate the feeling and evaluation of the ST about the facts that participants were able to verify, which opens the door for possible corrective actions of reinforcement, such as:

- Improve backing for the general goals.
- Review incentives and their formulas.
- Pay more specific and effective attention to social and environmental issues.

With respect to the conclusions of market forces in relation to NC and PC, the ST responded to the instruction: *Select 5 conclusions on the issues resulting from NC and PC market forces*, with the comments illustrated in Figure A10.

**Figure A10. Conclusions of market forces with respect to NC and PC**



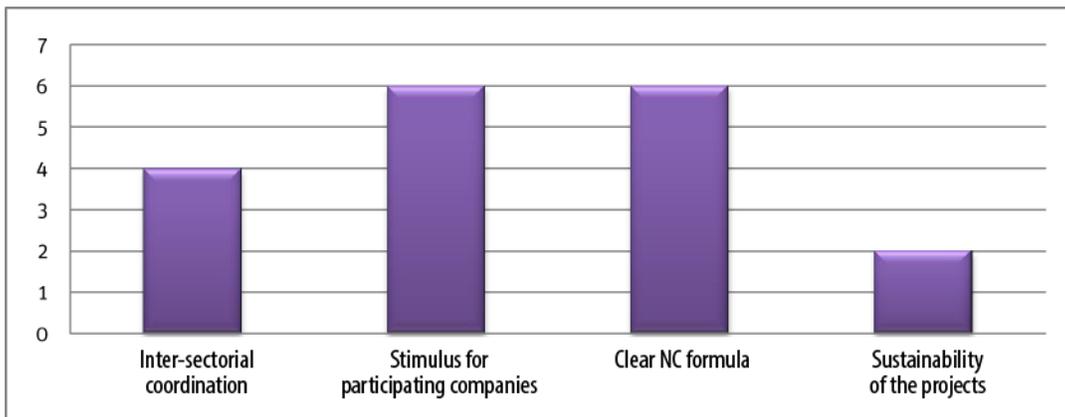
The conclusions of EE show six times that there is an opportunity for SMEs in PCs, while four mentions indicate the need to reduce market risks and take advantage of international oil companies interested in the concept of PC and development of clusters or consortia related to the industry. Finally, three mentions indicate that the challenges for improving competitiveness will be a market force which will drive development of enterprises in Mexico.

### ***f. Recommendations***

As a result of the processes of compilation, analysis and participatory discussion of the work done by the ST, two groups of recommendations emerged.

With respect to the recommendations related to NC and PC, and as responses to the instruction *Select 5 recommendations on the NC and PC topics derived from the reforms*, the answers are presented in Figure A11.

**Figure A11. Recommendations with respect to NC and PC**



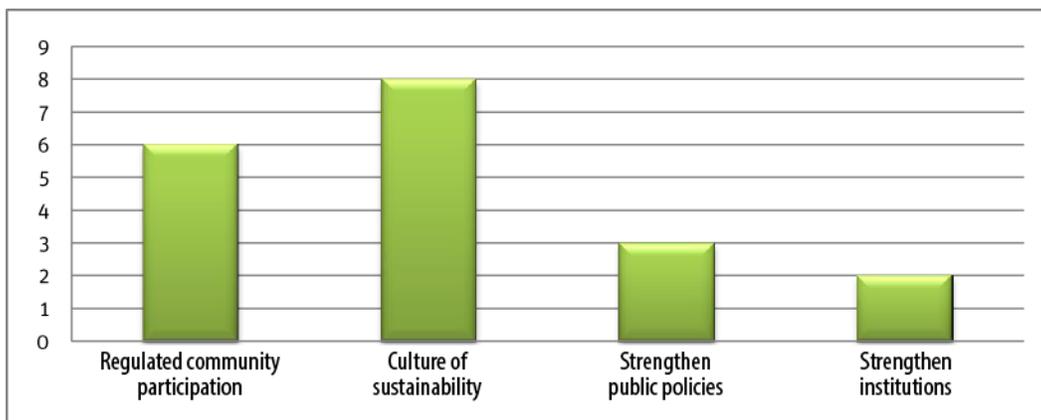
The ST makes two recommendations with six mentions each: that there are incentives for participating companies and a clear formula for NC, while on four occasions the participants recommended that inter-sectorial coordination was needed, and finally with two mentions emphasize project sustainability.

Summarizing and simplifying the recommendations of this study, the proposed formula for successfully strengthening and developing concepts of national content and promoting creation and growth of productive corridors need to focus on two pillars: **stimulus and clarity**, in the context of effective **interdepartmental coordination**, respecting the principles of **sustainability** in all projects, all based on existing legislation and regulations.

It is worth emphasizing that the combination legislation-regulation with market forces should be strategically harmonized, in promoting the concepts of NC and PC, as the former (legislation-regulation) has a more effective impact in the short term, while market forces are dominant in the long run.

Moreover, throughout this project, and driven by the responsible participation of the social sector, which was also backed by all other sectors represented, the issue of social impact and the environment have emerged; to include this important issue in our recommendations, we formulate the following instruction: *Define the 5 strategic lines for improving social and environmental impact*. The answers are presented in Figure A12.

**Figure A12. Recommendations related to social impact and the environment**



The contributions from the ST focus on eight opinions to promote the culture of sustainability, including the concepts of economic, social and environmental returns. This involves

conducting a campaign of outreach and education on the subject: first, so that the concept of sustainability is understood in all its breadth and depth; and then, to begin developing business practices permeated by these principles.

Second, with six opinions of the ST, the recommendation of regulated community participation, which requires strengthening the legislation-regulation in this area, combined with good practices for the processes of consultation and development of agreements with the communities related to the projects, as can be seen in the case study of Colombia.

In third and fourth place come the recommendations related to strengthening public policies and institutions, indispensable actions for achieving the first two recommendations.

The formula proposed in this recommendation is to disseminate and genuinely apply the concepts of sustainability and community participation, backed by public policies and strong institutions.

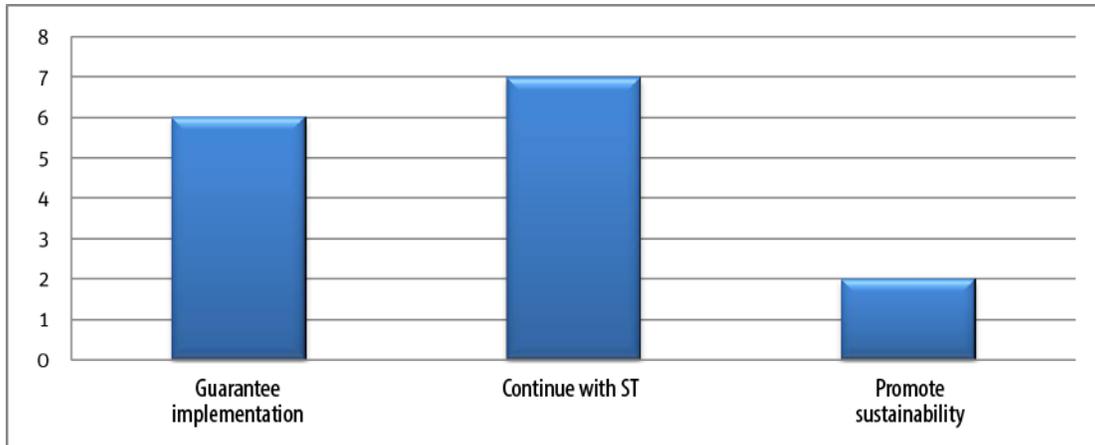
To give continuity to the issues raised during development of the project, what has been called "proposals to support the recommendations made" are presented below

#### ***g. Proposals supporting the recommendations***

1. Define how to continue the ST model developed in this project and led by the Inter-American Development Bank (IDB). In the recommendations of the ST members, their opinions can be evaluated and Figure A13 shows their proposals.
2. Promote a project to develop an input-output model, backed by a system of information on the energy sector in line with the recommendations of the Institute of Economic Research, UNAM.
3. Implement a national program for development of clusters or consortia in the sector, based on the strategic information generated by the input-output model, and using synergies and linkages with other national sectors.
4. Promote a long-term project to gauge national supply, taking a permanent census of existing and potential national suppliers to the sector, coordinated by the country's business leaders, Pemex, international operators and the Ministry of Economy (SE) , all accompanied by systems to measure competitiveness indicators, resulting in definition of relevant and effective programs by the academic sector.
5. Define an inter-sectorial program to develop the initiatives of entrepreneurs and social and

environmentally responsible companies, led by business leaders, with the active participation of the social, educational and public sectors, having as main objective reduction of poverty, increasing responsible wealth and taking advantage of the historic opportunity offered by the growth of the energy sector.

**Figure A13. Proposals to continue the ST**



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