



Advocates Coalition for Development and Environment



What Matters When it Comes to Adopting Local Content?



A Comparative Analysis of Success Factors in Africa and Latin America

April 2017

Elijah Dickens Mushemeza, John Okiira - ACODE

Marcela Morales, Juan José Herrera – Grupo FARO

ACODE Policy Research Series No.79



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ACRONYMS

AEP	Angolan Enterprise Programme
ANP	Agência Nacional do Petróleo (National Petroleum Agency, Brazil)
BNDES	O Banco Nacional Do Desenvolvimento (National Bank for Economic and Social Development, Brazil)
CAE	Centro de Apoio Empresarial (Business Support Centre, Brazil)
CENPES	Centro de Pesquisas Leopoldo Américo Miguez (Research and Development Centre, Brazil)
CNPE	Conselho Nacional de Política Energética (National Energy Policy Council)
EDC	Enterprise Development Centre
IFIs	International Financing Institutions
IOCs	International Oil Companies
LC	Local Content
LCFs	Local Content Frameworks
LE	Local Employment
MPP	Master Procurement Plan
NAFIN	Nacional Financiera (National Finance Institution, Brazil)
NAPIMs	National Petroleum Investment Management Services
NCD	Nigerian Content Division
NIP	National Industry Participation
NNPC	Nigerian National Petroleum Corporation
NOC	National Oil Company
PAL	Petroleum Activities Law
PDPs	Productive Development Policies
PDVSA	Petróleos de Venezuela (Venezuelan Petroleum Company)
Pemex	Petróleos Mexicanos (Mexican Petroleum Company)
PPP	Public-Private Partnership
PROMINP	Programa de Mobilização da Indústria Nacional de Petróleo e Gás Natural (National Program for the Mobilisation of the National Oil and Gas Industry, Brazil)

PSAs	Production Sharing Agreements
SD	Skills Development
SEBRAE	Serviço Brasileiro de Apoio às Micro e Pequenas Empresas (Brazilian Service for Support to Micro and Small Enterprises)
SIIND	Sonangol Industrial Investments
SMEs	Small and Medium Enterprises
TRIMs	Trade-related Investment Measures
WBG	World Bank Group
WTO	World Trade Organisation
YPFB	Yacimientos Petrolíferos Fiscales Bolivianos (Bolivian Petroleum Company)

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While various people may have contributed to this research paper, the views expressed are those of the authors, who take sole responsibility for any errors or omissions. The authors hope that this research paper will contribute to the policy discourse on matters of local content in the utilisation of the environment and natural resources as well as providing new insights for research, policy, and advocacy.

ABSTRACT

Local content is a development strategy aimed at increasing the benefits from the oil and gas sector and translate them to other sectors of the economy. While this strategy has been widely adopted in Africa and Latin America there is little we know beyond specific country cases and the reasons why local content strategies have or have not been successful in these cases. Mapping these factors is challenging since every country exists under particular conditions and these factors might function differently depending on the context.

In this paper we attempt to identify some common factors by comparing the experiences of countries that have achieved successful local content outcomes. To do so we looked at the experiences of 7 Latin American and 7 African countries in order to analyse the factors present across all these cases and that can help explaining the achievement of positive local content outcomes. We argue that using a comparative strategy makes it possible to identify conditions that are present across cases that are very different from one another in many important respects, but that have all managed to achieve success in the implementation of local content frameworks. Since these common factors exist in such different contexts and yet lead to similar outcomes, we have some confidence that we can make policy recommendations for other countries and regions based on the findings of our analysis.

1. INTRODUCTION

Latin America and Africa are regions with important natural resource endowments. Historically high international prices for these commodities has incentivised the exploitation of natural resources in these regions, thereby generating significant revenues. Oil and gas producing countries from both regions have created various mechanisms to capture as much revenue as possible from their gas and oil industries and create the conditions required to expand the benefits to other economic sectors. These mechanisms – known as local content - have gained popularity among African and Latin American policy makers over recent years and are the subject of this comparative evidence paper.

Local content is defined as the extent to which the output of the extractive industry sector generates further benefits to the domestic economy beyond the direct contribution of its value-added through productive linkages with other sectors (Tordo & Anouti, 2013). These linkages are created when the oil and gas industry purchases inputs that are supplied domestically instead of importing them, national labour is hired or local skills development and knowledge transference are promoted (Auty 2006; Heum et al. 2003). Local content strategies vary from country to country and they may include regulatory interventions to increase local employment and national industry participation (Natural Resource Governance Institute, 2015) or to enhance skills development among national/local employees (Natural Resource Governance Institute 2015; Tordo et al. 2013). Local content outcomes are understood as the positive results achieved in a country in terms of generation of local employment, skills development investments and participation of the national industry along the oil and gas value chain.

Countries that adopt local content as a development strategy for their extractive sectors usually start by developing local content frameworks (policies and laws). While a well-designed local content framework is a valuable starting point, there are other factors that can shape their successful implementation (Aoun and Mathieu 2015). Mapping these factors is challenging since every country exists under particular conditions and these factors might function differently depending on the context. For this reason, existing literature on local content has not yet identified common factors across countries that account for the achievement of positive local content outcomes. Yet this exercise is important for identifying policy lessons that can be transferred from one country to another. In this paper we attempt to identify some common factors by comparing the experiences of countries that have achieved successful local content outcomes. We argue that using a comparative strategy makes it possible to identify conditions that are present across cases that are very different from one another in many important respects, but that have all managed to achieve success in the implementation of local content frameworks. Because these common factors exist in

such different contexts and yet lead to similar outcomes, we have some confidence that we can make policy recommendations for other countries and regions based on the findings of our analysis.

This paper starts by comparing local content in 14 oil and gas producing countries across Africa and Latin America in order to identify their local content frameworks (understood as policies and legislation) and the outcomes these countries have achieved. Through this comparison it was possible to identify the countries with better local content outcomes in both regions, namely Mexico and Brazil in Latin America and Angola and Nigeria in Africa.

A comparative analysis shows that these four countries demonstrate several common features. On the one hand, the existence of sound local content frameworks that are well structured and positioned within the country's legislation, and which include clear implementation and monitoring mechanisms. On the other hand, the National Oil Companies (NOC) in these countries have played an important role during the design and implementation of local content policies. Unlike other NOCs, national oil companies in Brazil, Mexico, Angola and Nigeria are not only in charge of adopting local content, they are also involved in the policy design process and are the institutions in charge of promoting its adoption, and even measuring and monitoring its implementation.

It is important to indicate that the factors analysed in this paper do not rule out or ignore the existence of other factors that can shape the positive achievement of local content outcomes such as the size and quality of a country's natural endowments, the existing industrial capacity or the quality of governance institutions.

This paper is structured in five sections. Section 1 reviews relevant literature about the factors that matter when designing a local content policy. Section 2 outlines the comparative strategy developed to identify the common factors that influence local content outcomes in four oil and gas producing countries in Africa and Latin America. Section 3 provides an in-depth analysis of the role of local content frameworks and National Oil Companies during the implementation of local content policies in Nigeria, Angola, Mexico and Brazil. Finally, Section 4 contains the main findings and policy lessons of this research.

2. LITERATURE REVIEW

The adoption of local content policies is common among most oil and gas producing countries. Commonly, countries establish productive development policies (PDPs) (or industrial policies) that aim to strengthen the productive structure of their national economy. These national policies include measures to promote national employment or local procurement and in most cases oil and gas industries are included. However, the establishment of local content policies designed specifically for the oil and gas sector as a development strategy or as a national priority is less common.

There are a few cases of countries that have embraced a comprehensive local content strategy for their oil and gas sectors which includes the development of specific frameworks, special capacity building programmes and creation of implementation and monitoring bodies, amongst others. These countries are benchmark cases and most existing literature regarding local content in the oil and gas sector focuses on them. These cases include countries such as Nigeria, Ghana, Angola, Mexico, Brazil, Trinidad and Tobago, Indonesia, Malaysia and Norway. Africa is the region where most countries are currently adopting or implementing local content policy. In Latin America, on the other hand, only Mexico and Brazil have adopted specific local content policies while in other oil and gas producing countries debate on the topic remains weak.

2.1 What Do We Know?

During the implementation of local content policies, there are many factors that can influence the successful achievement of outcomes. Oil and gas countries have unique contexts that influence the design and implementation of local content policies. Existing literature provides a broad review of the general factors that are important when designing and implementing local content policy, or, in other words, the aspects and preconditions of the country and the sector that policy makers should consider before the design or during the implementation of a local content policy. These factors can be grouped into four sets: resource preconditions, industrial capacity, sector governance and international trade agreements.

According to Tordo et al. (2013), geology and geography – or **resource endowment** - are the first set of factors that policy makers should consider when designing a local content policy. Other related aspects, such as the quality of the resource and the location of the reserves, are also important since they can contribute to defining the industrial capacity, workforce and technology required for the development of the project (Tordo et al. 2013) (Tordo, Michael, Osmel, & Yahya, 2013). Moreover, countries with important and good quality resource endowments have “bargaining leverage” over companies with which they can implement more stringent local content requirements.

Tordo et al. (2013) also argue that **industrial capacity** is one of the most important factors for policy makers to consider when designing a local content policy. According to them, the level of technology and the industrial base of a country shape the type of policy required to promote local content. If a country's local content strategy is focused on the promotion of local procurement, for example, national and local service companies must have high levels of technology and the country's national industries must be able to meet the standards that international extraction companies require (Heum et al. 2011). If the local content policy aims to develop linkages and spill over effects with the wider economy, the industrial base and technology of the country are essential (Klueh et al. 2007; Kazzazi and Nouri 2012; Heum et al. 2011; Morris et al. 2011) (Klueh , Pastor, Segura, & Zarate , 2007; Kazzazi & Nouri, 2012; Heum, Kasande, Ekern, & Nyombi, 2011; Morris, Kaplinsky, & Kaplan, 2011). Energy access should also be considered when designing a policy since it is a key input for oil and gas company operations and in most cases the state is in charge of its provision. On the other hand, if the strategy will be focused on the promotion of local employment, the capacities of available workforce are a key factor to consider (Tordo et al. 2013).

Institutional and legal arrangements are also important. Hence, extractive **sector governance** is as an additional factor that matters when designing and implementing local content policy (Tordo et al. 2013). Corruption, lack of transparency and bureaucracy are challenges that countries and companies commonly face which negatively influence local content implementation (Tordo et al. 2013). In the same vein, whether the government manages a liberal or protectionist policy towards its oil and gas sector can also influence the implementation of local content. As Tordo et al. (2011) analyse, there has been a long history of privatisation and liberalisation in these industries. These processes have been accompanied by the creation of National Oil Companies that have directly influenced the implementation of local content. If well managed, these companies can create value through different mechanisms (Tordo et al. 2011); nevertheless, if NOC performance is weak, they can become a burden to local content implementation at the expense of private investment and production delays. The role of NOCs in the implementation of local content will be more fully analysed in subsequent sections of this paper.

Finally, **international trade agreements** are an additional aspect to consider for determined countries. As part of their commercial policy, most countries sign trade agreements with their neighbours or are part of trade blocks (for example, the Andean Community, the East African Community, the World Trade Organisation (WTO). In some cases, these agreements include requirements to the detriment of local content policies, especially the ones that prioritise local or national companies over internationals. Better known as trade-related investment measures (TRIMs), these agreements can limit the capacity of government to enforce the implementation of local content policies (Ado, 2013). In his research, Ado analyses the impediments that TRIMs represent to local content implementation in countries that are part of the WTO and critically debates this dynamic.

Besides the review of general factors, existing literature also focuses on specific country cases and provides analysis of the aspects that have led to the achievement of successful local content outcomes in these countries. The literature also includes cases in which countries have faced challenges during local content implementation.

Morales et al. (2016) stress the importance of well-designed local content frameworks, strong NOCs and a business friendly environment when achieving local content outcomes for oil and gas producing countries in Latin America¹. Kazzazi and Behrouz (2012) support this conclusion after running a model to identify the correlation between the factors that might influence the development of local content. Their analysis shows a positive correlation (the highest among the variables of their study) between local content policies and local content development (Kazzazi & Nouri, 2012).

Along the same lines, Mushemeza and Okiira (2016) argue that well-designed local content frameworks, the presence of International Financing Institutions (IFIs) such as the World Bank, and the presence of local content monitoring entities – such as enterprise centres and monitoring boards – are important factors that shape local content outcomes in Africa, especially in Angola and Nigeria.

Nordas et al. (2003) and Tordo and Anouti (2013) analyse specific case studies of countries that have adopted a local content policy and the general outcomes they have achieved. These countries include Angola, Brazil, Indonesia, Kazakhstan, Malaysia, Trinidad and Tobago, Brazil, Mexico, Nigeria, Angola and Norway. For the purpose of this research, the main findings regarding Brazil, Mexico, Nigeria and Angola are reviewed below.

According to the authors, after adopting specific local content policies, Brazil has successfully increased its local content quotas. In this scenario, Brazil has emerged as an important actor for implementing local content and permanent monitoring of the compliance of local content targets. Bidding processes incorporate local content requirements and designated institutions monitor compliance according to the national local content framework. However, despite the fact that there has been an increase in the creation of jobs and local industries have been strengthened, Brazil has faced challenges due to the costs of implementing its local content policy, production quota delays, a lack of technology and some issues of corruption. Despite this, Brazil has become a reference for other countries in the region when creating and adopting local content frameworks.

Mexico's oil and gas industry has a strong history of protectionism and nationalisation. Pemex (Mexico's NOC) and the Union of Oil Workers have played a pivotal role in the implementation of local content. Mexico's local content strategy has focused on the development of its national industries through industrialisation programmes. Despite

¹ Heum et al. 2011 shows similar findings.

the achievement of positive local content outcomes such as the development of a sound and competitive industrial base outside the oil sector and the generation of national jobs, Mexico's monopoly and protectionism over the industry has resulted in some challenges such as reduced exploration levels, a weak technology infrastructure and overstaffing of Pemex among others (Nordas et al. 2003). This paper will review in detail the main aspects of Mexico's local content policy and the outcomes achieved.

Nigeria has introduced several measures with the objective of increasing local value added, employment and ownership in the petroleum and industrial sector. The Nigerian Oil and Gas Industry Content Development Act was passed in 2010 and subsequently the Nigerian Content Development Monitoring Board was created in order to monitor and enforce the Act (Nordas et al. 2003). This framework has contributed to increasing ownership in Nigerian National Petroleum Corporation (NNPC, Nigeria's NOC) and employment of national labour in skilled, unskilled, professional and managerial positions. Moreover, International Oil Companies (IOCs) have been more active in promoting local content in Nigeria through independent skills development programmes. However, due to the fact that the objectives of the Local Content Act are quite ambitious, Nigeria has faced many challenges during implementation in terms of reaching the expected targets. Furthermore, Nigeria faces historic challenges such as corruption, weak internal governance and low capacities (Ovadia, 2014).

Angola has been following two strategies, the "angolanization" of the workforce and the domestic sourcing of goods and services. To this end, the government has created a series of frameworks, especially through decrees and PSAs. Sonangol (country's NOC) has played a key role during the implementation of these strategies, which has resulted in the achievement of targets such as the increment of national jobs (unskilled, mid and upper level) with higher rates reported on unskilled and administrative staff. Lack of experience of local and national firms has been a challenge that foreign firms have faced (Tordo & Anouti, Local Content in the Oil and Gas Sector: Case Studies, 2013). Weak governance, conflict of interest and the danger of local content reinforcing the power of the country's elite are some of the challenges faced by Angola that influence the way in which local content is implemented (Ovadia 2014).

Finally, some literature focuses on countries that have achieved mostly positive outcomes and that have developed local content policies to expand their oil and gas sector internationally. For example, in reviewing the case of Norway and the path it took to implement local content policies, Heum (2008) highlights the uniqueness of this case since Norway had strong institutions and an industrialised economy before oil and gas was discovered. These factors enabled Norway to focus on the participation of its national industry within the oil and gas sector first nationally and then internationally. Easo and Wallace (2014) identify as another key factor for Norway (and also for the United Kingdom) its highly educated workforce with technical competence in manufacturing, shipbuilding and engineering. Notwithstanding, the Norwegian and British cases offer few lessons for countries that do not share these characteristics, as is the case for Africa and Latin America.

2.2 What We Do Not Know: Local Content Across Regions

A considerable amount of literature is available on specific cases of local content. Most of these are analysed through a revision of the characteristics of their local content frameworks, the environment in which they are implemented and the role of different institutions and actors during implementation. Although valuable, lessons from benchmark cases such as Norway, the UK, Canada and Malaysia, are limited in terms of their applicability to countries with entirely different contexts, such as those in Africa and Latin America where poor governance, corruption and a weak industrial base and workforce are specific challenges faced by oil and gas producing countries in these regions. The stage of economic and social development of these countries is another aspect that influences the policy-making process.

While African countries have been actively discussing the adoption of local content policies during recent years, Latin American countries have adopted different strategies to promote local content as part of their productive policies, although they have not developed specific frameworks for the oil and gas sector. Both Latin American and African oil and gas producing countries have been involved in this dynamic for years and have achieved different kinds of outcomes. Hence a comparative study of these cases is required to draw out relevant lessons for other developing countries with similar contexts.

Currently, existing literature is focused on specific cases rather than on common factors and transferable lessons that account for successful local content outcomes, so there is still an important gap in research as far as comparisons across cases is concerned. Our paper represents an initial attempt to fill this gap and provide lessons that can be transferred between countries and regions. Through analysing common factors that have led to successful local content outcomes in Mexico, Brazil, Angola and Nigeria our research will shed light on important considerations, in particular for those countries where governments are starting to shape their national oil and gas policies.

3. COMPARATIVE RESEARCH METHODOLOGY

This paper seeks to shed light on the factors that determine successful local content outcomes in Africa and Latin America. In order to do so, we used a comparative framework that looks into the experience of seven countries in each region. For this analysis we selected all the countries in Latin America that are oil and gas producers in the region, namely Argentina, Bolivia, Brazil, Colombia, Ecuador, Mexico and Venezuela. In Africa we selected sub-Saharan countries that are either oil and gas producers or have significant reserves in relation to their economies. These countries are Angola, Chad, Equatorial Guinea, Ghana, Nigeria, Tanzania and Uganda.

By comparing countries with such different backgrounds and conditions we intend to identify trends amongst the factors that contribute towards achieving positive local content outcomes. The logic behind this comparison is that if we manage to identify factors that are present in every country despite their inherent differences, then we can identify some of the factors that can help explain the achievement of positive local content outcomes beyond regional or country particularities.

We understand local content outcomes in terms of local employment generation, national industry participation along the oil and gas value chain and skills development for local employees in the oil and gas sector. In the first stage of our research, we used local content outcomes as a comparison tool that allowed us to narrow our analysis down from 14 to 4, consisting of the two countries from each region with the highest outcomes from. In the second stage of analysis, we focused on these four case studies to identify the factors that could explain the achievement of positive local content outcomes (see Figure 1).

Figure 1. Comparative Research Methodology

Stage 1		Stage 2	
Analysed Countries	Aspects of Comparison	Analysed Countries	Aspects of Comparison
14 countries <ul style="list-style-type: none"> • 7 Africa • 7 Latin America 	Local content outcomes	4 countries <ul style="list-style-type: none"> • 2 Africa • 2 Latin America 	Factors that lead to positive local content outcomes

In the first stage of our analysis we looked for the cases with the best local content outcomes in each region. In order to rank the 14 countries, we developed a standardised scoring mechanism to allow us to make comparisons across countries where local content indicators are not always available or are measured in different ways.

As indicated in Table 1 below, we assessed the outcomes of three broad local content strategies: generation of local employment (LE), skills development (SD) and national industry participation (NIP). Each strategy was scored on a scale ranging from 0.5 (low) through 1 (medium) to 1.5 (high). A score of 0 was given where outcomes could not be identified. We used three different sources of information in order to score each strategy - data from oil and gas companies, contracts and secondary sources - taking into account that data to measure local content outcomes is scattered and often not centralised in one official source. For this reason we used three different sources of information that were available in most of the countries analysed for this study.

Table 1. Scoring Matrix – Local Content Outcomes

STRATEGY	SOURCE OF DATA		
	DATA FROM OIL & GAS COMPANIES	CONTRACTS	SECONDARY SOURCES
LOCAL EMPLOYMENT (LE)	<ul style="list-style-type: none"> • High (1.5) – % The company has at least 90% of national / local employees • Medium (1) – The company has 80 to 90% of national employees • Low (0.5) – The company has less than 80% of national employees 	<ul style="list-style-type: none"> • High (1.5) – Contracts a) are linked to/reflect national legislation regarding LE; b) include mechanisms to measure LE; and c) include mechanisms to monitor and implement LE • Medium (1) – Contracts a) are linked to/reflect national legislation regarding LE; and b) include mechanisms to measure LE; or c) include mechanisms to monitor and implement LE • Low (0.5) – Contracts are linked to/ reflect national legislation regarding LE 	<ul style="list-style-type: none"> • High (1.5) – a) There is evidence and data to support the outcomes reported by the companies; and b) there are press releases/articles about the companies' LE practices and their achieved outcomes that substantiate the achievement of LC outcomes • Medium (1) – a) There is some evidence to support outcomes reported by the companies; b) there are press releases/articles about the companies' LE practices and their achieved outcomes that substantiate the achievement of LC outcomes • Low (0.5) – There is little evidence supporting LC outcomes
SKILLS DEVELOPMENT (SD)	<ul style="list-style-type: none"> • High (1.5) – SD investment per employee is \$1,500 US dollars or higher • Medium (1) – SD investment per employee is between \$500 and \$1,500 US dollars • Low (0.5) – SD investment per employee is \$500 US dollars or less 	<ul style="list-style-type: none"> • High (1.5) – Contracts a) are linked to/reflect national legislation regarding SD; and b) includes mechanisms to measure SD; and c) include mechanisms to monitor and implement SD • Medium (1) – Contracts a) are linked to/ reflect national legislation regarding SD and b) includes mechanisms to measure SD; or c) include mechanisms to monitor and implement SD • Low (0.5) – Contracts are linked to/reflect national legislation regarding SD 	<ul style="list-style-type: none"> • High (1.5) – a) There is evidence and data to support outcomes reported by the companies; and b) there are press releases/articles about the companies' SD practices and their achieved outcomes that substantiate the achievement of LC outcomes • Medium (1) – a) There is some evidence to support outcomes reported by the companies; b) there are press releases/articles about the companies' SD practices and their achieved outcomes that substantiate the achievement of LC outcomes • Low (0.5) – There is little evidence supporting LC outcomes

STRATEGY	SOURCE OF DATA		
	DATA FROM OIL & GAS COMPANIES	CONTRACTS	SECONDARY SOURCES
NATIONAL INDUSTRY PARTICIPATION (NIP)	<ul style="list-style-type: none"> • High (1.5) –Contract values awarded to local or national providers represent more than 90% • Medium (1) –Contract values awarded to local or national providers are between 80 and 90% • Low (0.5) – Contract values awarded to local or national providers are less than 80%. 	<ul style="list-style-type: none"> • High (1.5) –Contracts a) are linked to/reflect national legislation regarding NIP; and b) include mechanisms to measure NIP; and c) include mechanisms to monitor and implement NIP • Medium (1) –Contracts a) are linked to/reflect national legislation regarding NIP and b) include mechanisms to measure NIP; or c) include mechanisms to monitor and implement NIP • Low (0.5) –Contracts are linked to/reflect national legislation regarding NIP 	<ul style="list-style-type: none"> • High (1.5) – a) There is evidence and data to support outcomes reported by the companies; and b) there are press releases/articles about the companies' NIP practices and their achieved outcomes that substantiate the achievement of LC outcomes. • Medium (1) – a) There is some evidence to support outcomes reported by the companies; b) there are press releases/articles about the companies' NIP practices and their achieved outcomes that substantiate the achievement of LC outcomes • Low (0.5) – There is little evidence supporting LC outcomes.

We used the information disclosed by public and private oil and gas companies since data to measure local content outcomes at the national level or gathered by a central authority were inexistent in the majority of cases. We used contracts as a proxy to measure outcomes based on the assumption that when local content provisions are included in contracts it means that somehow local content policies have made their way into binding tools that can help translate policy into practice and outcomes. Secondary sources include reports and data available in open source formats such as news and media articles or academic reports on local content.

Table 2 below presents information gathered on the existence of local content requirements for employment, NIP participation, training and technology transfer, monitoring and implementation mechanisms, government programmes to support oil and gas companies in their local content-related activities, and NOCs participation in local content strategies and programmes for all 14 countries.

Table 2. Local Content Provisions in Case Study Countries

	Employment Requirements	National Industry Participation Requirements	Training Requirements	Technology Transfer Requirements	Monitoring and Implementation Mechanisms	Government supports oil & gas companies	NOCs participation
Brazil	X	✓	X	✓	✓	✓	✓
Mexico	✓	✓	✓	✓	✓	✓	✓
Angola	✓	✓	✓	✓	✓	✓	✓
Nigeria	✓	✓	✓	✓	✓	✓	✓
Ecuador	✓	✓	X	X	X	X	X
Argentina	✓	X	X	X	X	X	X
Bolivia	✓	✓	X	X	X	X	X
Venezuela	✓	X	X	X	X	X	X
Colombia	X	X	✓	✓	X	✓	X
Chad	✓	✓	✓	✓	X	X	X
Ghana	✓	✓	✓	✓	X	✓	✓
Tanzania	✓	X	✓	X	X	X	X
Uganda	✓	✓	✓	✓	X	X	X
Eq. Guinea	✓	✓	✓	✓	X	X	X

Source: Columbia Centre on Sustainable Investment 2015, authors' own elaboration.

Local content outcomes were scored in all 14 countries using the criteria set out in Table 1, and the two countries with the highest outcomes in each region were identified. The results of this process are presented in Table 3 below. In Latin America Brazil and Mexico scored highest and in Africa, Angola and Nigeria.

Table 3. Average Local Content Outcomes Scores in Africa and Latin America

Region	Country	LC Outcome Score (average)
Latin America	BRAZIL	1.17
	MEXICO	1.05
	COLOMBIA	1.00
	ECUADOR	0.72
	BOLIVIA	0.50
	VENEZUELA	0.44
	ARGENTINA ²	--

² Local content outcomes in Argentina could not be not measured due to lack of available data.

³ Local content in Ghana were not measured since its local content policy were recently adopted and there is still no evidence of outcomes.

Region	Country	LC Outcome Score (average)
Africa	ANGOLA	1.08
	NIGERIA	1.08
	CHAD	0.95
	GHANA ³	--
	GUINEA	0.67
	TANZANIA	0.50
	UGANDA	0.50

For the second stage of our analysis, we focused on the experiences in Brazil, Mexico, Angola and Nigeria in order to identify the factors that explain the achievement of these positive results. In particular, we analysed which specific institutions, state-led actions and/or policy measures to promote local content were present across the board. We then cross-checked the results against the remaining 10 countries to confirm that the factors that could explain the achievement of positive outcomes were not present in the unsuccessful cases, thereby confirming the validity of the explanatory factors.

Based on this assessment, we found that the countries with higher local content outcomes were also countries where local content policies are well developed and structured. In all four countries with higher local content outcomes, requirements to promote local content are integrated into different strategies (employment generation, NIP etc.). It is important to indicate that while not all aspects of LC were present in every case - for example, in Brazil employment or training requirements are not included in national LC policy or appear only at a basic level - the existence of monitoring and implementation mechanisms proved to be relevant for the achievement of positive local content outcomes in all four countries. In contrast, these mechanisms are non-existent in the other 10 countries.

In order to take the analysis one step further and assess whether the existence of well-structured local content frameworks can impact the positive achievement of local content outcomes, we rated each country's framework and analysed them in comparison to their achieved outcomes (see Table 4). To do so, we assessed each country using the following two criteria:

- i. The existence of strategies to promote local content i.e. local employment generation, skills development or national industry participation; and
- ii. The presence of local content within oil and gas frameworks and the existence of measuring, monitoring and implementation mechanisms within these frameworks.

For the purposes of this research, we refer to these two criteria as specificity.

Table 4. Specificity Scoring Criteria – Local Content Frameworks

STRATEGY	SPECIFICITY		
	LC PRESENCE IN OIL AND GAS FRAMEWORKS	MEASUREMENT	MONITORING & IMPLEMENTATION MECHANISMS
LOCAL EMPLOYMENT (LE)	<ul style="list-style-type: none"> • High (1.5) – There are LE provisions within specific LC laws and other oil and gas laws (i.e. hydrocarbons law) • Medium (1) – There are provisions within oil and gas legislation. There are no specific local content laws • Low (0.5) – Local content provisions are only included in general laws (i.e. labour law) 	<ul style="list-style-type: none"> • High (1.5) – Entails a) LE quotas in % or other measuring mechanisms; and b) minimum requirements for the hiring of local employees in different positions, hierarchies or skills levels • Medium (1) – Entails a) LE quotas in % or other measuring mechanisms; or b) minimum requirements for the hiring of local employees in different positions, hierarchies or skills levels • Low (0.5) – LE provisions are declaratory; they do not include measuring mechanisms or minimum requirements for the hiring of local employees in different positions, hierarchies or skills levels 	<ul style="list-style-type: none"> • High (1.5) – There are a) entities that ensure the adoption/monitoring of LE regulations; and b) fines and/or incentives for the implementation of LE regulations • Medium (1) – There are a) entities that ensure the adoption of LE regulations; or b) fines and/or incentives for the implementation of LE regulations • Low (0.5) – Provisions do not include monitoring/implementation mechanisms
STRATEGY	LC PRESENCE IN OIL AND GAS FRAMEWORKS	MEASUREMENT	MONITORING & IMPLEMENTATION MECHANISMS
SKILLS DEVELOPMENT (SD)	<ul style="list-style-type: none"> • High (1.5) – There are SD provisions within specific LC laws and other oil and gas laws (i.e. hydrocarbons law). • Medium (1) – There are provisions within oil and gas legislation. There are no specific LC laws. • Low (0.5) – LC provisions are only included in general laws (i.e. labour law) 	<ul style="list-style-type: none"> • High (1.5) – There are mechanisms to measure a) % of SD investment; and b) technology transfer • Medium (1) – There are mechanisms to measure a) % of skills development investment; or b) technology transfer. • Low (0.5) – SD provisions are broad and declaratory; they do not include measuring mechanisms or minimum Requirements for skills development or technology transfer 	<ul style="list-style-type: none"> • High (1.5) – There are a) entities that ensure the adoption/ monitoring of SD regulations; and b) requirements for training programmes or agreements with universities/ other SD institutions • Medium (1) – There are a) entities that ensure the adoption/ implementation of SD regulations; or b) requirements for training programmes or agreements with universities/ other SD institutions • Low (0.5) – Provisions do not include monitoring/implementation mechanisms
NATIONAL INDUSTRY PARTICIPATION (NIP)	<ul style="list-style-type: none"> • High (1.5) – There are NIP provisions within specific LC laws and other oil and gas laws (i.e. hydrocarbons law). • Medium (1) – There are provisions within oil and gas legislation. There are no specific LC laws. • Low (0.5) – LC provisions are only included in general laws (i.e. labour law) 	<ul style="list-style-type: none"> • High (1.5) – There are a) mechanisms to measure NIP; and b) minimum % of NIP requirements in the oil and gas sector • Medium (1) – There are a) mechanisms to measure NIP; or b) minimum % of NIP in the oil and gas sector • Low (0.5) – NIP provisions are declaratory; they do not include measuring mechanisms or minimum Requirements for NIP 	<ul style="list-style-type: none"> • High (1.5) – There are a) entities that ensure the adoption/monitoring of NIP; and b) NIP criteria included in bidding processes in the oil and gas sector • Medium (1) – There are a) entities that ensure the adoption/ implementation of NIP; or b) NIP criteria included in bidding processes in the oil and gas sector • Low (0.5) – Provisions do not include monitoring/implementation mechanisms

Each country was ranked on a scale ranging from 0.5 (low) to 1.5 (high). The specificity scores achieved by each country are presented in Table 5 below. In order to draw connections, we compared the LC specificity score with the LC outcomes scores in each country.

Table 5. Local Content Specificity Scores Compared to Local Content Outcomes in Africa and Latin America⁴

Region	Country	LC Frameworks Scores	LC Outcomes Score
Latin America	BRAZIL	0.94	1.10
	MEXICO	0.89	1.00
	COLOMBIA	0.78	1.00
	ECUADOR	0.78	0.72
	BOLIVIA	0.61	0.50
	VENEZUELA	0.61	0.44
	ARGENTINA ⁴	0.44	--
Africa	ANGOLA	1.16	1.08
	NIGERIA	0.89	1.08
	CHAD	0.67	0.95
	GHANA	0.89	--
	GUINEA	0.67	0.67
	TANZANIA	0.50	0.50
	UGANDA	0.50	0.50

This analysis shows there is a relationship between the local content specificity scores and the achieved outcomes in these countries. This is particularly clear in the cases of Brazil and Mexico (high LC specificity scores and high outcomes scores) and Argentina, Bolivia and Venezuela (low LC specificity scores and low outcomes scores). This relationship is also present in Angola and Nigeria (high LC specificity score and high local content outcomes) and in Guinea, Tanzania, and Uganda (low LC specificity score and low local content outcomes). This indicates that LC frameworks containing clear objectives and measuring and monitoring mechanisms are more likely to achieve better local content outcomes. Countries that have not achieved positive local content outcomes, such as Bolivia, Tanzania and Venezuela, are also countries whose LC frameworks are less specific according to our evaluation.

Local content frameworks in Brazil and Mexico are the most developed in Latin America and have been in place longer than in other countries in the region. Frameworks in both countries contain mechanisms to measure and enhance local content that include specialised institutions for the promotion of these goals. Brazil introduced local content policies in the oil and gas sector in 1997 through the National Petroleum Law, since then national industry participation has been at the centre of the country's local

⁴ Local content outcomes in Argentina were not measured due to lack of available data.

content strategy. Local content legislation in Mexico was enacted in 2014 through the Hydrocarbons Act that sets minimum local content targets.

Angola is one of the countries in Africa with the most developed local content legislation. Local content regulations in Angola are present in several laws passed between 2003 and 2009 and focus on enhancing local employment and procurement of local goods and services. The key legislations governing oil and gas sector in Angola include the Petroleum Activities Law 2004 (PAL) and the Petroleum Taxation Law 2004 (PTL). Nigeria is the largest oil and gas producer in the region and is also one of the few countries with a law entirely dedicated to local content. Nigeria's Local Content Law was passed in 2010 however other regulations that deal with local content were issued in the early 2000s.

In addition, we identified that in countries with higher local content outcomes, National Oil Companies are actively involved in adopting and implementing local content (see Table 2).

While every analysed country in the region has a fairly visible National Oil Company, Petrobras in Brazil and Pemex in Mexico have played very active roles implementing local content policy in comparison to other NOCs in the region (like Petroamazonas in Ecuador or Pedevesa in Venezuela where local content promotion is seen as the responsibility of private companies). The role of these NOCs goes beyond adopting local content laws since Petrobras and Pemex have local content divisions within their corporate structure and have been actively involved in the development of programmes to develop worker and supplier capacities. In Africa, the cases of Angola and Nigeria are similar in that NOCs are the primary instrument through which the government puts local content strategies into practice.

Based on this comparative analysis we identified that the existence of well-designed local content frameworks and the role of NOCs are factors that have the potential to positively shape local content outcomes in oil and gas producing countries. It is necessary to highlight the fact that these factors by themselves do not ensure the success of local content in a country. For this reason it is important to identify the mechanisms that have led countries such as Mexico, Brazil, Nigeria and Angola to achieve positive local content outcomes through local content frameworks and the participation of National Oil Companies.

In the next section we go deeper into the analysis of these factors in order to trace links between LC frameworks, the role of NOCs and local content outcomes in each case study.

4. COMPARATIVE EVIDENCE

As established in the previous section, the existence of LC frameworks and NOCs involved in the local content implementation process are factors present in countries that have achieved positive local content outcomes. This section explores the extent to which these factors have contributed to the achievement of positive local content outcomes in Brazil, Mexico, Angola and Nigeria.

4.1 Approaches to Local Content Frameworks

Evidence suggests that the achievement of positive local content outcomes has a direct relation with the type of frameworks that oil and gas producing countries from Africa and Latin America have developed to promote local content. Morales et al. (2016) and Mushemeza and Okiira (2016) explore in detail the main provisions of local content frameworks in both regions and their achieved outcomes.

As shown in Table 2, Brazil, Mexico, Angola, Nigeria and Ghana are the only cases among the 14 countries that include within their LC frameworks monitoring and enforcing mechanisms, government programmes to support gas and oil companies in their local content-related activities and the participation of NOCs in local content implementation. These aspects could contribute to explain the positive outcomes these five countries have achieved⁵. In order to deepen the analysis, local content frameworks of the four case studies were studied to assess the approach each country has taken to understand the legal, institutional and operational steps these countries have taken, as well as to identify similarities and differences.

Annex 1 compiles information regarding the local content frameworks in the four case studies and shows the differences and similarities between them. Nigeria is the only country that has enacted a specific Local Content Act that guides national policy. Brazil and Angola have developed specific laws or decrees for tackling specific topics such as bidding rounds, monitoring systems and hiring, among others. Mexico, on the other hand, has included its local content policy within its Hydrocarbons Law and oil and gas contracts. Thus, the four countries present similarities in terms of regulating local content. Although they use different means, all four have established a specific framework to regulate and monitor local content as part of national hydrocarbon policies, meaning their LC frameworks are not relegated to broader policies regarding industrialisation or economic development, amongst others.

The LC frameworks in Brazil, Nigeria and Mexico contain a clear definition of local content unlike Angola. For the case of Brazil it is interesting to observe that the definition and

⁵ As previously explained, Ghana is not part of the analysis since the country has been implementing its local content policies for too short time to report outcomes.

the main frameworks only focus on the promotion of the country's national industries through procurement practices and bidding processes as opposed to Mexico, Angola and Nigeria, who give importance to employment and skills development as well. Mexico and Nigeria understand local content from a more broad perspective, which includes local employment and training for nationals. In spite of varying definitions and emphasis on distinct elements of local content, one common denominator among the four countries is the inclusion of clear LC provisions in legislation and contracts, which we treat as specificity in our analysis (see Table 4). The implication of this finding is that the more specific LC provisions a country has, the more likely it will achieve positive local content outcomes.

The specificity of local content frameworks also includes efforts to measure and monitor implementation. Mexico demonstrates the most concerted effort in this regard, having developed a methodology that has set the ground for monitoring local content compliance among relevant authorities. Brazil also includes the measurement of local content during the bidding process where providers' offers must include local content targets. Nigeria and Angola have no a clear methodology or mechanism for calculating or measuring local content.

Mexico and Brazil focus in particular on the development of their national industries unlike Angola and Nigeria. Hence, Brazil and Mexico have created frameworks that prioritise this goal and have implemented programmes to achieve it. This might explain why more quantitative data is available for Brazil and Mexico on LC outcomes (Morales et.al. 2016) than Angola and Nigeria whose results are scattered across several documents (Nordas et al. 2003; Mushemeza and Okiira 2016).

Regarding institutions, Brazil, Angola and Mexico have designated the tasks of designing and monitoring local content implementation to different state entities such as the National Energy Policy Council (Conselho Nacional de Política Energética or CNPE) and the National Petroleum Agency (Agencia Nacional do Petróleo or ANP) in Brazil, the Ministry of Finance in Mexico and the Ministry of Petroleum in Angola. Similarly, Nigeria has established the Nigerian Content Monitoring Board to guide, implement and monitor the provisions of the Nigerian Content Act. These institutional mechanisms have proven to play a fundamental role in the implementation of local content development in our selected case studies.

The implementation of LC frameworks has enabled the selected case study countries to establish national industry bases with varied strengths and results. Angola is the country that has the most national employment requirements and therefore its frameworks are focused on the establishment of quotas, procedures and penalties to promote jobs for nationals in the oil and gas sector; known as the "Angolanization" of the workforce. Nigeria and Mexico focus on job creation and national industries participation and hence these elements as provisions. In Brazil, provisions relating to national workforce, goods and services are observable. When these frameworks are scrutinised further,

the tendency to prioritise national industry participation vs. employment is observable (World Bank 2014; Morales et al. 2016; Mushemeza and Okiira 2016). Brazil and Mexico have established mechanisms such as local content minimum requirements for bidding processes and capacity building programmes for suppliers. For their part, Angola and Nigeria prioritise employment by setting employment quotas that are easily adoptable in the short-term (Tordo and Anouti 2013; Nordas et al. 2003). Where local content policies are more focused on the procurement of goods and services (national industry participation) and skills development, countries have managed to develop their manufacturing sector and reduce dependence on oil revenues.

Although the presence of LC frameworks and institutions influence the achievement of outcomes, the enforcement of these frameworks represents an important challenge for policy makers. The next section reviews how countries have translated their local content frameworks into practice and the main outcomes.

4.1.1 Local Content Frameworks in Practice

Countries face major challenges when enforcing their local content frameworks; hence government should accompany the development of LC frameworks with appropriate enforcement and monitoring mechanisms. This section analyses how each case study country has put into practice their frameworks and achieved outcomes. This analysis aims to show the connection between these frameworks, the monitoring and enforcing mechanisms and the local content outcomes achieved.

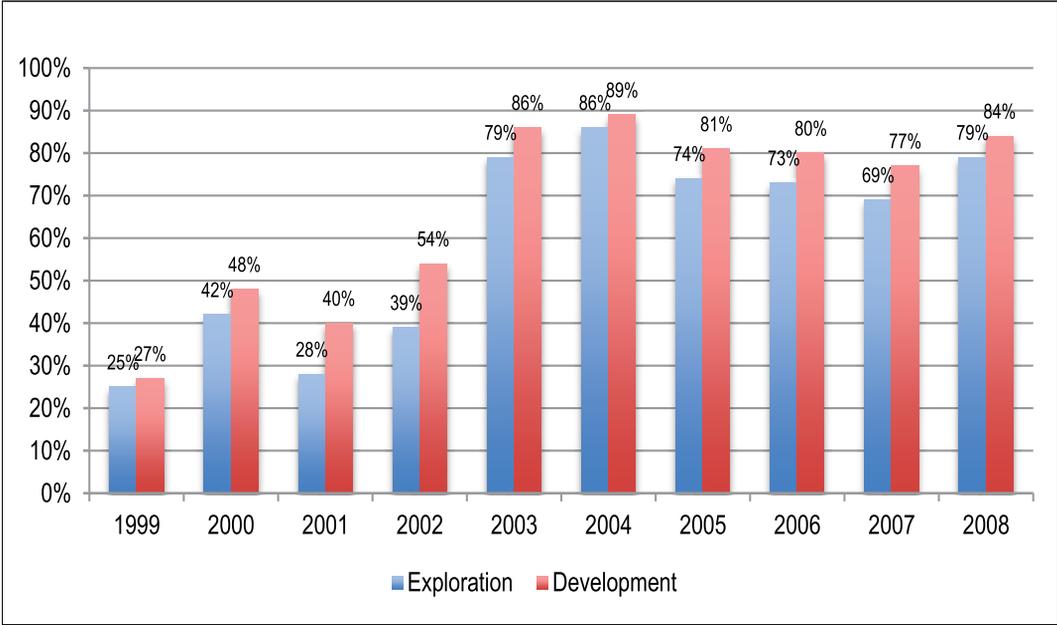
Brazil: Promoting Local Sourcing through Bidding Processes

“Everything which can be done in Brazil should be done in Brazil”, expressed former President Lula Da Silva when introducing local content policies after the discovery of important heavy crude oil reserves. These policies included innovative measures to incorporate local content requirements in bidding processes. Hence, local content has become an important consideration for companies since it accounts for about 20% of points allocated during bidding processes associated with the granting oil concession. In addition to specifying local content percentage, Brazil’s current licensing regime requires each operator to specify a separate local content percentage for particular categories of goods and services. Moreover, to qualify as local content, products must be acquired and manufactured locally. At the same time, companies must obtain local content certificates from suppliers and submit quarterly investment reports to the ANP. If they do not reach targets, fines and penalties might be imposed.

In 1997, the Brazilian National Petroleum Law was passed. One of its main provisions stipulates that competitive bidding for concession contracts must include minimum thresholds for local content. The implementation of this policy has translated into important outcomes. As Figure 2 below shows, the average local content commitment defined during exploration stage increased between 1999 and 2003 and from that

year to 2008 has maintained high levels. These commitments have translated into outcomes when concessionaries implement their operations (development phase).

Figure 2. Brazil: Average Local Content Commitment Resulting from Bidding Rounds (1999-2008)



Source: Tordo and Anouti 2013

Table 6 below shows the total investment made by concessionaries during 2011. As can be observed, local investment is significant across the three highest categories of investment: geology and geophysics (65%), logistics and operational support (71%), and well drilling, completion and assessment (85%). The overall average for local investment is 70%.

Table 6. Brazil: Cumulative Total and Local Investments (USD million) and Average Local Content Investment, 2011

	Total investment	Local investment	Average LC%
Geology and geophysics	509.0	328.8	65
Drilling rigs	88.0	38.2	43
Logistics and operational support	1059.0	747.5	71
Well drilling, completion, and assessment	232.1	196.4	85
Basic engineering and detailing	6.5	6.1	94
Management, construction, assembly, and commissioning	7.8	7.0	90
Electrical, control, instruments, and measurement systems	3.7	3.6	97
Telecom systems	0.1	0.1	100

	Total investment	Local investment	Average LC%
Oil and gas pipelines, storage tanks	1.0	0.8	80
Compression units	3.7	3.0	81
Steam generation and injection units	0	0	0
Subsea equipment and control systems	0.5	0.3	60
Oil-processing and treatment systems	2.4	2.0	83
Natural gas-processing and treatment systems	0	0	0
Platform and ship building	43.4	27.6	64
Health, safety, security and environment.	16.3	14.6	90
Civil works and utilities	18.7	18.4	98
Total	1991.3	1394.5	70,0

Source: Tordo and Anouti, 2013

Despite the fact that the outcomes achieved by Brazil are promising, oil and gas actors have catalogued Brazilian policies as ambitious. Although it is recognised that these measures have created jobs and benefited local business, the outcomes have been achieved at the expense of private investment. Hence, this measure is considered a “bottleneck” for private companies since it has caused delays and represents a major obstacle to efficiency and growth in the sector. Private companies including Petrobras and international service providers have struggled to achieve sufficient local content whilst delivering goods and services of the required quality, on time and within budget. Apparently the government knows about these issues and consequently changed local content policy through Decree No. 8.637 (2016) which eased up on some of the requirements and established incentives and bonuses for concessionaries.

Mexico: Local Content Measurement

Pemex is the main institutional channel through which Mexico promotes local content with a particular focus on providers. In this sense, Pemex has developed a comprehensive strategy for the development of providers, contracts and national content including detailed information on the measurement of local content. However, a major challenge currently faced by Mexico is the decrease of its oil production rate. To overcome this challenge, the government issued an energy reform in 2013 that seeks to promote foreign investment by IOCs in the country’s oil and gas sector. However, if IOCs intend to invest in Mexico they must comply with the local content requirements that the country has set for the awarding of contracts. These requirements are measured through a methodology developed by the Ministry of Finance.

Besides this, Pemex has implemented efforts aimed at ensuring that national providers are aware of procurement calls for services. To date, Pemex has been achieving positive outcomes regarding local content, especially in terms of national industry participation. The company has established several programmes with its

providers and has a complete register of the contracts awarded to national and local providers. Likewise, Pemex has developed several communication channels to develop capacities among its providers. For example, its website has an entire section devoted to providers in order to include them in bidding process for services and goods⁶. Based on Pemex figures, the company spent 234,161,966,950 Mexican pesos on providers and contractors in 2015. This amount was spent on 227 providers lending different services to Pemex throughout the year. From this number, a total of 197 providers are from Mexico meaning that about 87% of Pemex's providers during 2015 were Mexican. These providers are registered in different state, although most are located in the City of Mexico (78 providers – 40% of all Mexican providers in 2015).

In 2015, in the first call for bids for shallow-water blocks⁷, the model production-sharing contract included requirements for 13% local content during the exploration period and 25% during the first year of development, increasing 1% per year up to 35%. However, the definitions and metrics are as yet unclear and Mexico is working with several actors in order to reach agreements on how to measure local content.

There is a degree of uncertainty about what will happen in coming months regarding local content due to the energy reform. Actors from the sector indicate that there will be a trade-off between the government's desire to increase private investments and the application of local content policies. Other challenges actors from the oil industry highlight include Mexico's strict labour policies and the level of corruption within the industry.

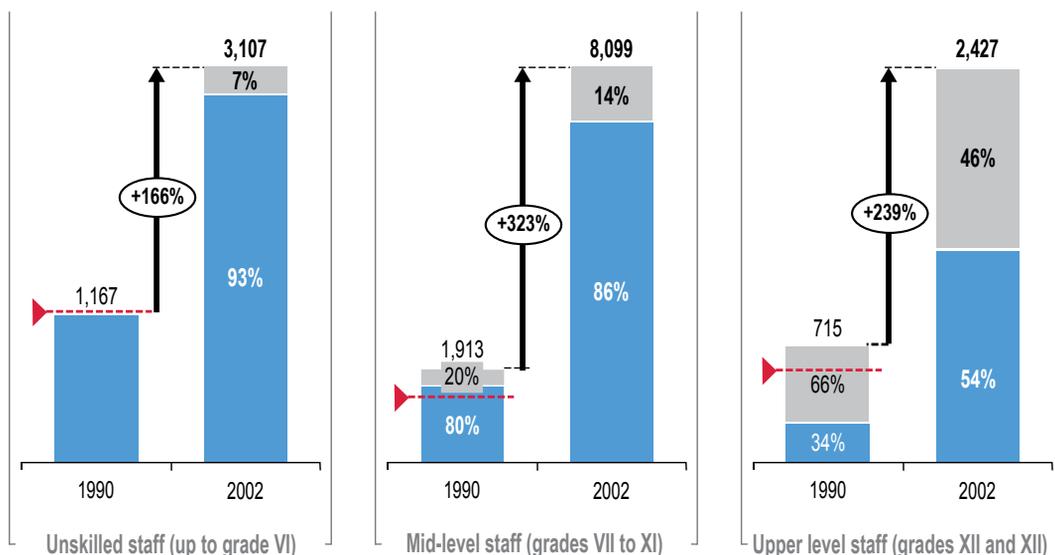
Angola: Angolanization of the Workforce

Although Angola has established local content provisions for the procurement of goods and services, the main focus of its frameworks is on local employment. These policies have achieved positive outcomes since the number of Angolans involved in the country's oil sector has increased considerably. As Figure 3 shows, the targets that Angolan authorities set in 1990 were met in 2002 for unskilled workers, exceeded for mid-level staff, and came short by 46 percentage points for higher- skilled staff. Overall, the Angolanization rate was 77 per cent. According to Tordo and Anouti (2013), by 1999 the total number of workers had increased to 10,061 while Angolanization rates remained similar to the 1990 levels. In 2002 the total number of Angolan workers increased by around 35 percentage points from the 1999 levels. Compared with 1990, the overall Angolanization rate increased to 88 per cent (Tordo and Anouti 2013).

⁶ See <http://www.pemex.com/procura/Paginas/default.aspx>

⁷ Bidding process held in Brazil for offshore extra heavy crude.

Figure 3. Angolanization Rates. Targets Versus Outcomes (1990 - 2002)



Source: Tordo and Anouti 2013

Besides the achievement of outcomes regarding the Angolanization of the workforce, Angola established the National Petroleum Institute to promote education and skills development amongst the national workforce in the oil industry. However, national and international actors argue that Angola has focused its efforts on employment generation leaving aside the local procurement of goods and services. In this respect, Angola has set broad provisions for prioritising local suppliers, which resulted in the concession of six joint ventures for several activities between 1984 and 2002. According to experts, due to Angola’s high dependence on oil revenues, policy makers should focus their attention on developing the country’s national industries.

Nigeria: Local Content Act

Nigeria is the only country of the analysed cases that has developed a specific local content specific. The Nigerian Content Act includes several provisions that regulate procedures for the implementation of local content. One of the main mandates of the act is the creation of the Nigerian Monitoring Board, which is responsible for designing and implementing local content policies. According to official Nigerian sources, the establishment of the Board has been fundamental for the Nigerian oil sector due to its enforcement role. On the other hand, due to the multiple activities of the Board, most of the time this entity is overwhelmed and this causes delays.

Nigeria's local content law contains several procedures with which companies must comply. However, according to interviewed national private actors, inefficient processes cause important delays during the development phase, such as delays in deliveries from service companies that directly affect NNPC's production. There is also evidence of corruption in Nigeria's oil and gas sector, which represents an additional cause for delay. In some cases, local content processes have been involved in corruption scandals.

Nigeria has introduced several measures with the objective of increasing local value added, employment and ownership in the petroleum sector as well as in the industrial sector more generally. However, the considerable oil revenues flowing into Nigeria over the past four decades have not been translated into adequate infrastructure, social services or an enabling environment for industrial development (Nordas et al. 2003). Moreover, during the implementation of its local content policy, despite increases in national jobs and national contract awards, Nigeria has failed to promote Small and Medium Enterprises (SMEs). According to Bellema (2010), Nigeria's local content framework only led to increased contract awards to existing companies without enhancing the participation of new entrants into the industry.

Overall, little is known about local content aggregate over the years since no information is available on local content measures. According to Nordas et al. (2003), figures on local content in Nigeria vary widely from one source to another making the assessment of local content outcomes in Nigeria a difficult task.

As discussed throughout this section, Brazil, Nigeria, Angola and Mexico have established local content frameworks focused on several goals and have achieved positive outcomes. In general, evidence suggests that the development of comprehensive local content frameworks influences the achievement of positive outcomes. For instance, the specific provision of the Brazilian National Petroleum Law regarding minimum thresholds for local content during bidding processes has boosted local content commitments resulting from bidding rounds. However, these countries have also faced important challenges related mainly to delivery delays, corruption and lack of capacities. In this sense, further analysis is necessary in order to study the relationship between local content policies and these challenges and the possible means to avoid them.

As pointed out earlier, National Oil Companies are a fundamental actor in the implementation of local content policies and have a direct impact on the achievement of local content outcomes. As such, the next section analyses this relationship in the cases of Nigeria, Angola, Brazil and Mexico.

4.2 The Role of National Oil Companies in Supporting the Achievement of Positive Local Content Outcomes

National Oil Companies control over 90% of the world's oil and gas reserves and 75% of production (Tordo, 2011). According to Tordo (2011) approximately 60% of the world's undiscovered reserves are located in countries where NOCs have privileged access to these reserves and to major oil and gas infrastructure systems. For this reason, it is fair to say that NOCs have the potential to shape the economy and the energy needs of resource-rich countries.

In Brazil, Mexico, Nigeria and Angola, NOCs control an important share of oil and gas production and, as a consequence, they play an important role in the adoption and implementation of policies in the extractive sector, including local content policies. However, the mere existence of NOCs does not guarantee that local content is going to be successful. For example, in other countries such as Venezuela or Bolivia where NOCs also control important shares of the sector, positive local content outcomes are yet to be achieved.

In this section we analyse the role that NOCs have played in achieving positive local content outcomes in Brazil (Petrobras), Mexico (Pemex), Nigeria (NNPC) and Angola (Sonangol).

In Latin America and Africa, the creation of NOCs followed different interests and logics (see Table 7). In Mexico, Pemex was established as a mechanism to improve labour and wage conditions for workers whereas in Brazil Petrobras was created to promote self-sufficiency, respond to growing industrialisation and increase the participation of national companies along the oil and gas value chain. NOCs in Nigeria and Angola, as in many other countries in Africa, were created during post-independence periods when countries set about nationalising their assets to regain state control, gain higher rents from foreign companies, generate employment and promote technology transfer (Lwanda 2011; Nwokeji 2007).

In spite of the different historical contexts in which they were established, NOCs in Brazil, Mexico, Angola and Nigeria became the primary drivers of local content policy due to the prominent role they gained over time.

Table 7. Historical Development of NOCs in Brazil, Mexico, Nigeria and Angola

Phase	Historical Conditions	NOC	Responsibilities
Pre -1960	National Oil Companies formed around specific local issues (improved labour laws or self-sufficiency)	PEMEX - Mexico (1938)	Created as a limited company entirely owned by the Mexican government
		Petrobras - Brazil (1953)	Petrobras was given the monopoly over petroleum sector activities.
1960s -1970s	Countries nationalised their assets to regain control from foreign companies. NOCs were created to ensure state control over oil resources and to gain higher rents.	NNPC - Nigeria (1977)	NNPC is an integrated oil and gas company, wholly owned by the Nigerian government.
		Sonangol - Angola (1975)	The company was granted sole concessionaire rights over petroleum resources and mandated with regulatory and operational activities.

Source: (Tordo, Brandon, & Noora, 2011).

The experiences of Brazil, Mexico, Nigeria and Angola show that NOCs positively influence the adoption of local content. Unlike other NOCs in Latin America, like PDVSA in Venezuela or YPFB in Bolivia, Pemex and Petrobras follow clear institutional guidelines pertaining to local content that are embedded within the companies’ strategies. Pemex’s work regarding local content is guided (besides the existing LC laws) by its Strategy for the Development of Local Contractors and National Content (Pemex, 2013) which recognises the NOC’s role as a productive state company in charge of the development of the national industry along the oil and gas value chain. This strategy prioritises Pemex’s actions on developing the national industry as a strategy to overcome low oil prices.

Petrobras also has an institutional local content policy which indicates that all projects and acquisitions for Petrobras must support the company’s strategic plan and maximise local content through the integration of the supply chain (by executing procurement in a coordinated manner), capacity development of local suppliers and supporting local market development to overcome technology gaps. The NOC’s LC policy also determines the business areas that are considered a priority for the oil and gas sector and where local content goals need to be achieved. Petrobras defines local content targets based on an assessment (carried out by the company) of all the required goods and services for each extractive project, and subsequently calculates local content for each project based on competitive prices, delivery and time prices.

NOCs in Angola and Nigeria show a similar trend whereby the NOC has very well defined guidelines and responsibilities regarding local content. While there are no local content guidelines (such as in the cases of Pemex and Petrobras), the national LC frameworks clearly position the NOCs as key actors in the implementation process. Sonangol is considered the “national engine” for local content related growth and for the implementation of Angolanization policies intended to increase workforce

participation and technology transfer in the oil and gas sector. Within Sonangol, the Local Content Department is in charge of developing a local content strategy for the NOC in coordination with the Ministry of Petroleum. Other responsibilities for Sonangol include the negotiation of Production Sharing Agreements (PSAs) that include local content quotas and the management of procurement through the selection and development of local suppliers.

NNPC in Nigeria works under a similar framework as Sonangol. The NOC does not have an internal local content strategy, but it does have a Nigerian Content Division (NCD) that comprises three departments in charge of capacity building, planning and monitoring. These departments identify best practices and advise NNPC on the adoption of local content measures, generate data related to the industry and develop strategies for capacity building. NNPC also participates in the development of a Master Procurement Plan (MPP) to increase the participation of the national industry.

Another aspect that Pemex, Petrobras, Sonangol and NNPC have in common is the existence of programmes specifically created to translate local content guidelines into practice. In countries like Ghana and Ecuador, where NOCs are relatively strong, there is not the same type of involvement by the NOCs in the local content strategy as in the analysed cases. In Ghana and Ecuador, NOCs adopt local content but are not necessarily seen as key partners when it comes to creating the conditions required for the successful adoption of LC strategies.

Pemex leads the Supplier Relations Programme, which aims to ensure that local suppliers have the necessary capacities to become Pemex suppliers. This programme is based on the idea of collaboration between the NOC and key suppliers at different stages of the value chain. As part of this programme, Pemex has developed several initiatives that include:

- Pemex Pass is an online platform for registering and evaluating suppliers. The purpose behind this platform is to connect supply and demand across different operating areas.
- Pemex works closely with the national financing institution Nacional Financiera (NAFIN) to improve supplier access to financial services and technical assistance in order that they are able to meet commitments with Pemex.
- The Suppliers Development Programme identifies gaps between supply and demand and runs skills development programmes for registered suppliers.

As a result of these initiatives Pemex has enabled the country to register positive local content outcomes. In particular, at the end of 2013 PEMEX registered 145,246 operator posts occupied by 141,875 workers, an increase in 0.85% compared to 2012. In the same year, Pemex invested approximately \$48 million US dollars in training, representing a 10.5% increase over the previous year. A total of 15,137 courses were

offered to 209,764 workers, representing an average of 89.14 hours of annual training per worker, surpassing the 32 hours reported by the American Society for Training and Development for leading companies (Pemex, 2013).

Petrobras has the longest trajectory interacting with suppliers and collaborating with various actors in Brazil to achieve and enhance the adoption of local content. Some of the programs Petrobras has implemented include:

- The National Programme for the Mobilisation of the National Oil and Gas Industry (Programa de Mobilização da Indústria Nacional de Petróleo e Gás Natural or PROMINP), which seeks to increase the participation of Brazilian industry in the implementation of extractive projects. Petrobras and the Ministry of Mines and Energy coordinate this initiative.
- The Petrobras-Sebrae Agreement between Petrobras and the Brazilian Service for Support to Micro and Small Enterprises (Serviço Brasileiro de Apoio às Micro e Pequenas Empresas or Sebrae) seeks to encourage the integration of micro and small enterprises into the oil and energy supplier network.
- The Progredir Programme allows small and medium-size suppliers to secure loans from Petrobras' partner banks. Petrobras acts as an "anchor" to assist suppliers to obtain credit from financial institutions and the National Bank for Economic and Social Development (O Banco Nacional Do Desenvolvimento or BNDES).
- The Credit Right Investment Funds initiative seeks to enable suppliers with whom Petrobras has contracts to secure capital and funding at rates lower than those available on the market.
- The Research and Development Centre (Centro de Pesquisas Leopoldo Américo Miguez or CENPES) aims to partner Petrobras with leading global specialists in exploration and production services in order to enhance technology transfer and commercial ties to address Brazil's technology challenges in the future

The NOC in Brazil is credited for promoting positive local content outcomes. In particular, in 2015 it employed 71,614 workers of whom 91.3% were Brazilian employees. In the same year Petrobras invested approximately 52 USD million in employee development and recorded the participation of 196 thousand employees in continued education courses and new employee training (Petrobras, 2015).

In Angola, Sonangol leads various initiatives aimed at strengthening the capacity of local enterprises, establishing factories and technology transfer. Many of these initiatives are public-private partnerships (PPPs) aimed at resolving the challenges that hinder the participation of national industries along the oil and gas value chain such as inadequate infrastructure and engineering equipment, insufficient financial resources to drive change, low technical expertise and limited collaboration between companies. Sonangol participated in the formation of the Angolan Enterprise Program

(AEP) designed to develop the capacities of SMEs with the support of IOCs such as Chevron. Another example is the Centre for Enterprise Support (Centro de Apolo Empresarial or CAE), an initiative developed in partnership between Sonangol, Chevron, Esso, Total and other IOCs. The CAE provides training for local SMEs in the fields of human resource management, supply chain management, health and safety, quality management and finance.

In terms of local content outcomes, the project under the CAE generated 4,809 jobs, certified over 100 companies in various sectors and delivered over 224 business training courses. Participating SMEs won over 300 contracts (WBG 2015; Mushemeza and Okiira, 2016). Similarly Sonangol Industrial Investments (SIIND) - a subsidiary of the NOC - is credited with having coordinated the establishment of 73 factories in the Vienna Special Economic Zone, investing \$50million US dollars in the first eight factories that opened in 2011. Six more factories were opened in the summer of 2012 at a cost of \$78 million US dollars and all the factories are producing for the oil industry including fibre optic, low and high voltage cables, paints and varnishes, plastics, pipes electrical equipment, irrigation materials, fittings, fencing and wire, hardware, pumps and plastic bags (Ovadia, 2014).

In Nigeria, the National Petroleum Investment Management Services (NAPIMS) is the initiative through which NNPC delivers its local content strategy. NAPIMS is in charge of monitoring the contracting procedures of NNPC ensuring that local content criteria are present in every contracting process. NAPIMS also provides capacity building for suppliers in order to ensure their ability to participate in the bidding processes of the industry. Within NNPC, the National Content Division is in charge of developing projects to bridge local capacity gaps in the industry, as well as certify and train local providers by partnering with IOCs through PPPs. The spirit of PPPs promoted by the government and the NOC in particular gave birth to the Enterprise Development Centre (EDC) hosted by the Pan African University since 1991. In terms of local content outcomes, the EDC trained 46 trainers, including 16 women, to deliver Business Edge workshops to 1,367 individuals including 414 women. At least 24,000 entrepreneurs and small business owners submitted business plans to the first You WIN Competition and 1,200 won between \$7,000 and \$70,000 US dollars in seed funding to start or expand their business (Mushemeza and Okiira 2016).

Despite the lack of a strong and independent measurement and evaluation system, the NNPC is credited for spearheading several developments and local content outcomes. The Nigerian Content Development Monitoring Board estimates that local capture of oil industry spend has risen from 5 to 40% in the last decade. It is estimated that with an annual investment of \$15 billion US dollars per year, local content practices could help retain over \$5 billion US dollars in the Nigerian economy annually (Ovadia, 2014). Nigeria's Ministry of Petroleum Resources estimates that in 2012 implementation of the Local Content Act led to retention in the national economy of over \$20 billion US dollars. Between 2010 and 2014, NNPC trained and employed 15,000 personnel

representing 80% of local employees in the sector. In the same period, the NOC awarded contracts to national and local companies at a value of \$52 billion US dollars - a clear success for national industry participation (Mushemeza and Okiira 2016).

What the experience of Pemex, Petrobras, Sonangol and NNPC show is the importance of the active participation of NOCs not only in the adoption of LC laws but also in the creation of the conditions that allow for local content strategies to be successful. This means, for example, the establishment of capacity development programmes for local suppliers, improving access to financial mechanisms or the implementation of technology transfer platforms. NOCs that are more actively involved in the adoption and implementation of local content policies are more likely to contribute to the achievement of local content outcomes. In this sense, NOCs should be positioned as key partners in every local content strategy.

5. FINDINGS AND LESSONS

Angola, Nigeria, Brazil and Mexico have achieved positive local content outcomes unlike other oil and gas producing countries from Africa and Latin America. These countries have structured their frameworks with broad provisions and also with specific technology, procurement, employment and training requirements, complemented by the establishment of monitoring and enforcement mechanisms, government support for oil and gas company programmes and the active participation of NOCs during implementation. Evidence suggests that with a specific local content framework and a strong NOC with clear guidelines and strategy, a country can achieve positive local content outcomes regardless of context.

While presence of NOCs can foster the generation of employment and technology transfer, it is important to keep in mind that the mere existence of NOCs is not enough. There are specific dynamics and factors inside the management of a NOC that can shape local content. For example, it is valuable for a NOC to collaborate with the private sector and international partners in order to enhance knowledge and technology transfer. NNPC and Pemex adopted measures to promote the participation and competition of private companies and partners. The case studies show that openness to the participation of private stakeholders does not diminish the NOCs' influence; on the contrary it strengthens their capacity and performance. The experiences of Petrobras and Sonangol highlight the importance that knowledge transfer can have for the development of strong technological basis in an oil company.

NOCs should play a prominent role when defining and implementing local content. Their involvement in this process can lead to positive local content outcomes in spite of other structural challenges such as limited independence from the government. The cases of Sonangol, NNPC, Petrobras and Pemex show that NOCs that adopt local content as part of their strategy are more successful at achieving positive local content outcomes. However, these case studies also highlight the importance of strengthening the institutional capacities of the extractive sectors in resource rich countries. While strong NOCs are desirable, they should not overrule the government. This misbalance can lead to corruption and lack of transparency that has also been found in all the analysed countries as part of this study.

Historically, the type of government appears to be a factor that has shaped the local content policy design process in oil and gas producing countries from Africa and Latin America. Protectionist governments have tended to nationalise the oil and gas sector in order to secure direct control. On the other hand, liberal governments have tended to attract foreign investment by ensuring national companies compete on equal terms with IOCs. This has been complemented by additional factors such as independence processes, oil price booms and internal economic crisis. The dynamics of all these

factors directly influenced the design process of local content frameworks.

Policy makers should consider short and long-term benefits when designing local content policies. The achievement of short-term positive outcomes might be easier to attain through certain mechanisms such as the establishment of workforce and procurement quotas and scholarships requirements. However, building linkages through local content policies is a measure that can bring about longer-term benefits to the country's economy. As analysed in this paper, Angola and Nigeria have focused their local content policies on the generation of jobs and this has not contributed to a decrease in either country's dependence on oil revenues. On the other hand, Mexico and Brazil have established local content policies more focused on the procurement of national goods and services and have thereby managed to develop their manufacturing sector and reduce dependence on oil revenues.

Given the achievements of the Nigerian Enterprise Centre, African countries such as Uganda, Kenya, Tanzania and South Sudan that are still developing local content strategies should consider running training programmes through Enterprise Centres in order to develop skills in the local economy and promote the reputation of local companies as good corporate citizens. It is recommended that governments establish branches of Enterprise Centres in various parts of the country in order to ensure the widest possible reach in terms of capacity building amongst SMEs and companies, thereby equipping them with the skills and competencies to engage in joint ventures and create more jobs.

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ANNEX 1: LOCAL CONTENT FRAMEWORKS COMPARATIVE TABLE

	Brazil	Mexico	Nigeria	Angola
General Characteristics	<ul style="list-style-type: none"> - Local content addressed in the context of bidding rounds (minimum % of local content) - Compliance is monitored - Fines and penalties exist 	<ul style="list-style-type: none"> - There is an established methodology to measure local content - The overall minimum target for local content is 35% - Five dimensions of local content exist: the origin of goods and services, the use of national labour, training of national workforce, investment in infrastructure and technology transfer 	<ul style="list-style-type: none"> - Comprehensive local content framework including a local content act - The promotion of Nigerian Content is the major criterion for awards of licenses - There is an established board to guide, implement and monitor the provisions of the main act - There is a minimum level of Nigerian Content 	<ul style="list-style-type: none"> - There is no legal definition of what local content or the Angolanization policy is - Local content regulations are spread across various laws and decrees - The decree on human resource development includes very detailed lists of offences and high fines for infringing human resource development provisions
Definition	The proportion between the value of the goods produced and services rendered in Brazil in accordance with the terms of the Model Contract 2015 and the total value of the goods used and services provided for this purpose.	The percentage that represents the value in Mexican pesos of the goods, services, workforce (labour), training, transfer of technology and physical infrastructure on a local and regional basis, from the total value in Mexican pesos of such concepts as defined in the official methodology.	The quantum of composite value added to or created in the Nigerian economy through systematic development of capacity and capabilities through the deliberate utilisation of Nigerian human and material resources and services in the Nigerian oil and gas industry.	No definition exists

	Brazil	Mexico	Nigeria	Angola
Main Frameworks	<ul style="list-style-type: none"> - The National Petroleum Law (1997) stipulates that bidding must include minimum thresholds for local content - Law No. 12.351 (2010) defines local content for agreements in pre-salt and strategic area investments - Law No. 9478 (1997) established the National Energy Policy Council as responsible for increasing local content - ANP Resolutions No. 37 and 38 (2007) and 19 (2013) establish the local content certification system - Tender Protocol (2015) defines the tender protocol for bid round 13 - Model of contract for exploration and production (2015) sets out the benchmarking of local content requirements as well as exceptions, adjustments and penalties 	<ul style="list-style-type: none"> - The Hydrocarbons Law (2014) sets minimum local content targets and stipulates implementation mechanisms - The Methodology to Measure the Local Content in Contracts (2014) defines the procedure for measuring local content according to the five criteria of the definition above - Model contract (2015) contains clauses that refer to the local content minimums set in the Hydrocarbons Law 	<p>The main framework in Nigeria is the Local Content Act (2010) and all regulations, policies and contracts must refer to it. Its main content is:</p> <ul style="list-style-type: none"> - Preference given to Nigerian independent operators - Operators must submit a local content plan - Only Nigerians must be employed in junior and intermediate level positions - 5% maximum of expatriates in managerial positions - Preference given to qualified indigenous Nigerian companies. - Establishes the Nigerian Content Monitoring Board 	<ul style="list-style-type: none"> - The Petroleum Activity Law (2004) and Law for the Promotion of Business for Local Private Companies (2003) contain general provisions and do not constitute a comprehensive local content framework - The General Regulatory Framework for Hiring of Services and Goods from National Companies in the Oil Industry (2003) establishes a set of provisions that give preference to Angolan concessionaries - Decree 48/06 on Open Tender Procedures in the Oil Industry (2006) sets preferences during bidding processes for Angolans and the relations that concessionaries must have with Angolans companies - The Decree Law on the rules and procedures to observe in recruitment, integration, training and development of workers from the oil sector (2009) sets percentages for the recruitment of employees. Foreigners can be hired only with the authorisation of the Ministry of Petroleum.
Observations	<ul style="list-style-type: none"> - There are no employment or training requirements in the legal framework - Concessionaires have to meet local content targets when procuring goods and services and local content certificates establish whether these local content targets have been met - The National Energy Policy Council (CNPE) develops Brazil's Local Content policy and the ANP oversees its implementation - There are various clauses and frameworks to promote the procurement of goods and services 	<ul style="list-style-type: none"> - A plan to achieve local content targets needs to be included by concessionaries - Preference must be given to the employment and training of Mexicans - Preference must be given to national goods and services - There is a national registry of Mexican suppliers - There are penalties for non-compliance of local content targets - The Ministry of Finance is involved in the local content policy design and implementation processes 	<ul style="list-style-type: none"> - The Nigerian Content Monitoring Board investigates compliance with Nigerian content and set fines for non-compliance - Joint ventures between foreign operators and Nigerian companies are encouraged - Companies must notify the Board of all contracts and purchase orders above one million dollars and the Board assesses all the documents of the bid before the contract is granted - The Monitoring Board plays a fundamental role and operators must comply with its contractual procedures 	<ul style="list-style-type: none"> - Contractors need to ensure that the training programme results in transfer of technology and know-how - For human resource development, the law authorises the Ministry of Petroleum to develop an incentive policy based on fiscal, financial and technical support - A Fund for the Promotion of Entrepreneurship was established in 2008 to support the creation of local companies - Companies must submit annual human resource development plans - A detailed list of foreigners that have been hired must be submitted

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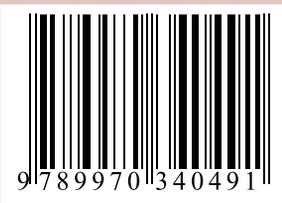


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