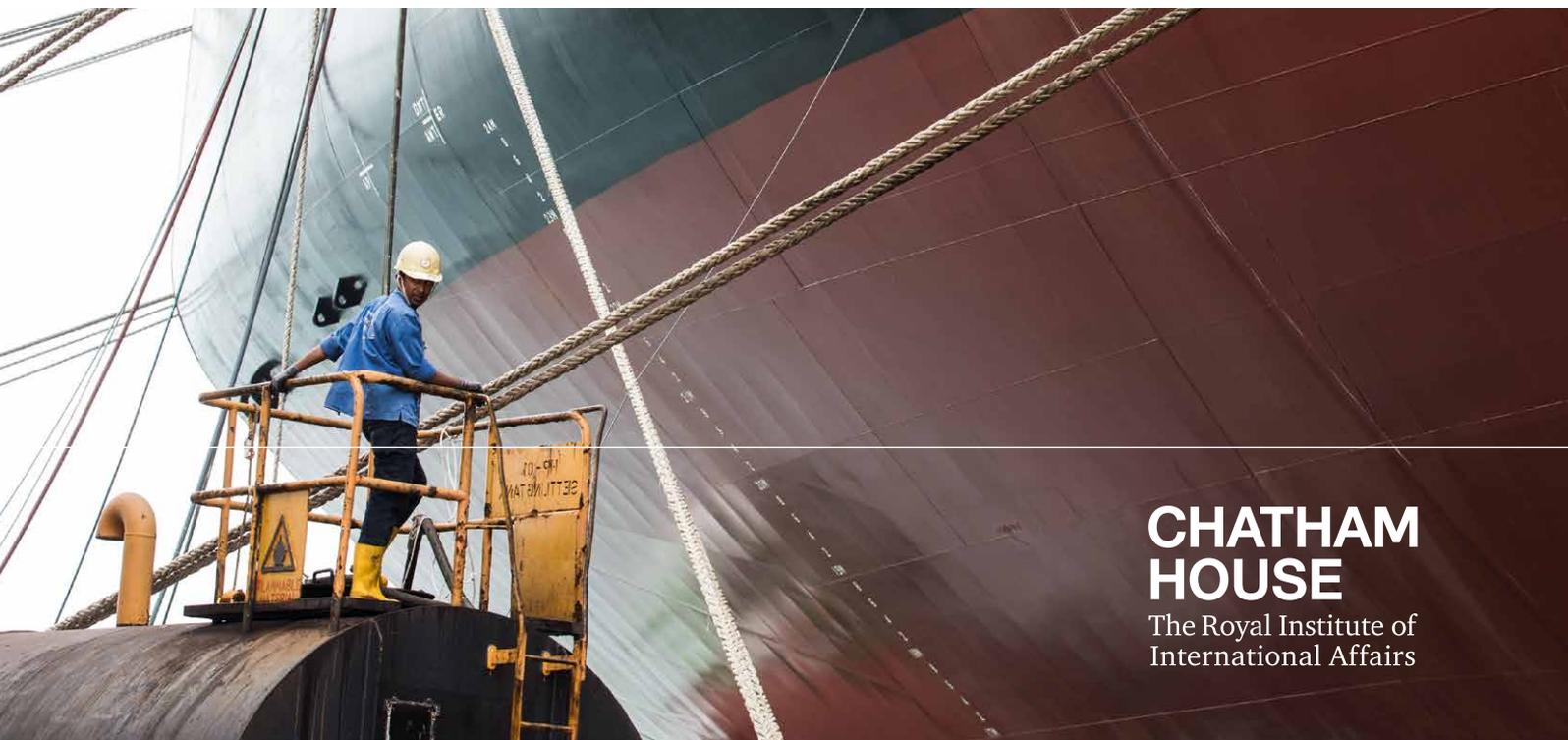


Research Paper

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A Local Content Decision Tree for Emerging Producers



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1. Introduction

Over the last decade of escalating oil prices, classic, politely-restrained corporate social responsibility (CSR) programmes have fallen out of favour. Instead, in return for access to new sources of oil, governments (and communities) in producing countries expect jobs, capacity-building, meaningful local content and the maximization of in-country value. Today it is estimated that between 82–90 per cent of the world’s reserves are located in countries with legal provisions on local content.¹

Some local content policies have been successful at leveraging the activities of the petroleum sector to create domestic economic opportunities. Countries such as the United Kingdom and Norway developed successful policies in the 1970s and 1980s to enhance the economic benefit of exploiting their natural resources. At around the same time in the 1970s, Trinidad and Tobago created value through the industrialization of its natural gas, which had previously been flared. Similarly, following its vast offshore oil discoveries in 2006, Brazil made the most of the resulting demand for sea transportation to enhance its own shipbuilding capabilities. Nigeria, a pioneer in African local content development, set rigorous targets by adopting legislation in 2010 to encourage Nigerian participation in domestic oil-related activities.²

Emerging oil and gas producers share these ambitions for capturing broader economic benefits from upstream petroleum activities and want to use the exploitation of their petroleum resources as a lever for industrialization and economic development. However, economic literature and historical experience show how difficult it is to achieve local content development in the extractives sector. Emerging producers – countries in the initial stages of developing their petroleum resources – face particular challenges related to uncertainty in regard to their resource base, lack of petroleum sector experience and often limited state administrative capacity. A sequenced approach to the development of local content may help to keep policy in line with evolving geological and market circumstances as well as changing domestic capabilities.

This paper proposes a template for designing local content policy that is adapted to the resource base, anticipated petroleum activities, capacity levels available in country and guided by national development aspirations. It seeks to present policy-makers of emerging producer countries with a structured framework for considering the multiple factors that come into play in the development of a local content policy. The simple roadmap reviews key considerations for assessing the expected petroleum sector demand (depending on whether the country is in the exploration phase, post-discovery onshore or offshore, or single or multiple projects) and existing national capabilities (skills, infrastructure, support industries). Policy considerations are presented in a decision tree format, to highlight the sequencing of geological steps typical of emerging producers when they move from exploration to discovery and on to production.

¹ Schlumberger Business Consulting research (2014); http://www.slb.com/news/inside_news/2014/2014_1219_local_content.aspx; R. Dobbs, J. Oppenheim, A. Kendall, F. Thompson, M. Bratt, F. van der Marel (2013). Reverse the curse: Maximizing the potential of resource-driven economies, McKinsey Global Institute, <http://www.mckinsey.com/industries/metals-and-mining/our-insights/reverse-the-curse-maximizing-the-potential-of-resource-driven-economies>.

² See CCSI’s survey of local content laws and provisions in various countries for further information on existing practice: <http://ccsi.columbia.edu/work/projects/local-content-laws-contractual-provisions/>.

2. What is Local Content?

The purpose of developing national local content policies is to increase the value generated by the exploitation of a resource that remains in the domestic economy; and to develop linkages between the oil sector and the rest of the economy. What matters is not only what happens in the sector but what happens beyond. As such, local content can encompass forward, lateral and backward linkages. Backward linkages are those created by the commercial relations between oil operators and their supply chains, which include the transfer of technology and know-how, employment of nationals, and sourcing local goods and services. Lateral linkages utilize the demand of the sector to develop skills, services and infrastructure that can positively impact on other sectors of the economy while allowing locals to participate in the petroleum supply chain. Forward linkages involve the construction of facilities that process and export these resources, such as refineries and petrochemical facilities. This paper focuses on backward and lateral linkages, which are of immediate concern to emerging producer countries hoping to see petroleum projects add value to their economy. Forward linkages are also taken into account to the extent that the discussion considers local content policies as part of a country's wider industrial policy aimed at economic diversification and transformation. However, the issue of how to use oil and gas in industries is better addressed as part of an overall industrialization strategy and encompasses a diversity of objectives, such as security of supply, import substitution and income distribution. This paper does not address local content in the form of state financial participation in the oil industry via equity stakes in upstream licences.

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More broadly, in this paper, local content refers to the creation of jobs and supply chains to meet the needs of the petroleum sector and, conversely, the use of natural resources as a lever to build linkages with the rest of the economy. A key concept used by petroleum producers in this context is 'in-country value'. The government of Oman, for instance, describes in-country value as 'the total spend retained in the country that benefits business development, contributes to human capability development and stimulates productivity in Oman's economy.'³ In short, it emphasizes the availability of products and services provided by Omanis for petroleum producers in Oman.

Local content, which is gauged by specific measurements and sometimes requires mandatory compliance, is distinct from CSR, which is broadly the commitment of businesses to contribute to sustainable economic development. It is also distinct from 'community content', which refers more narrowly to activity within a project's 'zone of influence', its 'directly affected communities', or its 'host communities'.⁴ 'Community content' can be handled by operators much like local content if some inputs are reserved for the affected communities or they were given preferential treatment. That said, mandatory local content requirements can include community content and CSR investments.

³ The Oil and Gas Industry In-Country Value Programme, Ministry of Oil and Gas, Oman, <http://www.incountryvalueoman.net/News/Oil-Gas-In-Country-Value-Programme>.

⁴ IPIECA (2016), Local Content: a guidance document for the oil and gas industry, (2nd edition), available at <http://www.ipieca.org/publication/local-content>.

3. The Pitfalls of Local Content Policy

Despite their appeal, local content policies often fail to meet national expectations. There is vast historical evidence demonstrating the failure of countries to capture and retain more value when exploiting their natural resources.⁵ The ‘resource curse’ and issues such as ‘Dutch disease’ have been prominently addressed by the economic literature.⁶ Moreover, cases abound of oil companies offering low-skilled jobs to locals, while foreigners retain high-paid jobs requiring experience and sophisticated training. Meanwhile, public pressure grows in many established and emerging producer countries for governments to extract from foreign oil companies greater access to the jobs and business opportunities derived from petroleum sector activities in their countries. As such, in a number of sub-Saharan African countries, the linkages developed are often shallow in breadth and depth and more akin to lip service.⁷

Common pitfalls of poorly designed local content policies include:

1. Lack of strategic direction: Policies that fail to consider long-term objectives in regard to industrialization, economic diversification and strengthening of value creation may focus on the easy ‘low hanging fruits’ of local content activities and miss out on opportunities to create in-country value. Priority may be given to low value added activities with limited capabilities for transfer into other sectors. These opportunities often cause short-term local economic booms that tend to be more disruptive to the local population in terms of a surge of consumption and localized inflation, and create community resentment toward those employed in the temporary oil activities.
2. Insufficient consideration of the changing capacities, resources and activities in the country. Drawing a baseline of existing capabilities and periodically assessing progress against the baseline allows countries to maximize short-term opportunities and plan for future needs as the knowledge about the resource potential and its impact is better known.
3. Despite efforts in some countries to engage oil operators, local content policies are often developed without a proper understanding of oil companies’ strategies, objectives and procurement practices. Developed in silos from industry, the result of government efforts can fall under two extremes: a rigid policy forcing strict quotas and percentages, resulting in significant cost inflation and delays; or a watered down policy where local content stipulations are encouraged but voluntary, resulting in an irrelevant policy.
4. Poorly designed implementation strategies that make measurement and reporting too complex or prescriptive, and do not properly consider the capacity of the regulator(s) to monitor and measure performance, can lead to poor enforcement or conditions that facilitate influence peddling or corruption of public officials.

⁵ The failure of indigenization in Nigeria and of national content in Angola from 1975–2002 is described in Ovadia, J. S. (2016), *The Petro-Developmental State in Africa: Making Oil Work in Angola, Nigeria and the Gulf of Guinea*, London: Hurst.

⁶ Sachs, J., Warner, A. (1995), *Natural Resource Abundance and Economic Growth*, NBER Working Paper (5398); Venables, A. J. (2016), ‘Using Natural Resources for Development: Why Has It Proven So Difficult?’ *Journal of Economic Perspectives*, 30(1): pp. 161–184.

⁷ ‘The breadth of a linkage refers to the proportion of inputs sourced locally or outputs processed locally, and depth refers to how thick those linkages are, or the level of domestic value added.’ in Morris, M., Kaplinsky, R., Kaplan, D. (2012), ‘One thing leads to another; Commodities, Linkages and Industrial Development’, *Resources Policy*, 37(4): p. 413.

5. Benefits are captured by local elites favouring rentier attitudes rather than competitive solutions. In many new producing countries the tax base is very low, which encourages political incumbents to seek other sources of income and to use patronage to secure political loyalty. Consequently, they may offer supply contracts to local entrepreneurs to reward political loyalty and to companies run by family members of the ruling elite. Local content in such instances fails to encourage entrepreneurial development and instead promotes rentier behaviour.⁸ In contrast, the development of local content should result in the broadening of the tax base – experience shows that only then can subsoil assets be transformed into other types of assets. There is often a trade-off between maximizing revenue and developing local content, but the extra cost of developing local content is justified if it expands the tax base. Rent-seeking-type local content doesn't expand the tax base, unless the rent seekers reinvest their rents in other truly productive activities in the country.
6. Poor access to information and limited understanding of demand and scheduling by local suppliers and training institutions. Similarly, lack of reliable information on availability, competencies and experience of local suppliers and individuals cause operators and their international suppliers to seek outside sources. In addition, the lack of assessment of competencies is a further issue. For instance, the host country might identify the national availability of welders, without understanding the precise welding competencies that would be required by the project.
7. Poorly defined or inconsistent terminology. It is imperative that governments have consistent definitions of the terms: local content, local company or supplier, and nationals/locals. These terms often have different meanings in trade agreements and treaties and in government procurement legislation. Definition is critical to target setting, measurement and performance management.

⁸ Mehlum, H., Moene, K., Torvik, R. (2006), 'Institutions and the Resource Curse', *The Economic Journal*, 116(508): pp. 1–20.

4. Guiding Principles for Local Content Policies

The analysis seeks to clarify policy options available at each specific stage during the development of the petroleum resource base and national human and physical capital. The following principles are generally applicable for emerging producers and may help to avoid the common pitfalls that can hamper local content policies.

Principle 1 – A national strategy for economic development should guide local content policy

Local content policy should be guided by a national vision that clarifies how to prioritize different policy objectives and identifies the sectors of strategic importance to government. The social values that govern national development priorities will also influence local content policies. There will be trade-offs, and governments must evaluate both costs and benefits. It is imperative to be clear about which objectives the policy will prioritize, such as public revenues, job creation, environmental protection and socio-economic equity. Coordination between national government ministries, local government and relevant sectors e.g. the power sector, educational institutions and manufacturing companies will aid the process. Broad national consultation and solidarity across political party lines should be built into the exercise of coming up with a national vision, to avoid partisan approaches to long-term planning.

Principle 2 – Local content policies should create value beyond the sector

Investments in building local capacity should be based on the principle of creating value beyond a specific project. A portfolio of petroleum projects will create a demand for specialized skills, but overall preference should be given to projects that require skills applicable in other economic activities (lateral linkages). Building local capacity for which there is insufficient demand erodes value. In contrast, local content (skills and suppliers) that can be repeatedly used by the petroleum sector and/or other sectors creates value. Effective investments in capacity-building therefore require a detailed understanding of the bigger demand picture going forward from all sectors of the economy.

Here it is useful to distinguish between the petroleum sector demand for skills associated with the construction phase and the production phase. The former typically provides employment for thousands of workers but only for a limited period of time, while the latter normally employs hundreds of workers but often at more sophisticated skill levels, and for periods that can last 15–30 years. Industry will invest in the specialist skills needed for the production phase. But the contractors engaged in the construction phase have a much shorter time period in which to build capacity and invest in long-term skills.

In the case of countries with a small resource, the opportunities for linkages between petroleum projects and the economy could be limited. Particular care should be given to developing the ‘right’ human (and physical) capital. For example, in a situation where the project lifecycle is expected to be short and the majority of the population lacks basic education, investing in the training of highly specialized petroleum professions built on tertiary-graduate education is not likely the most effective policy for economic development. It would be a regressive policy, favouring local elites – which once trained may not stay in the country, particularly if there is a limited portfolio of opportunities. Regional trade and diversification can increase the size of the market for a number of skills, goods and services, but as a study of regional cooperation in Africa demonstrated, policy efforts in this direction are hampered by a number of regulatory, institutional and political economy barriers.⁹

When assessing which industries or suppliers add economic value and which to support through local content policy, governments should be careful not to pick ‘winners’ simply to support a local economic elite.

When assessing which industries or suppliers add economic value and which to support through local content policy, governments should be careful not to pick ‘winners’ simply to support a local economic elite. Following the concept of the infant industry, governments should set the right conditions for broad industrialization. The activities benefiting from local content policies should result in: i) learning and productivity gains via cost reductions or improvements in quality; and ii) positive returns and an expanded tax base.¹⁰ Although these are difficult principles to measure, policymakers should ensure that the policy is temporary and, in time, leads to local companies being able to diversify and participate in new markets (domestically or internationally) without the support of the policy.

In determining what policies create value the difficulty is that many benefits cannot be quantified in monetary terms. Though difficult there are ways to measure their worth. For instance, businesses ascribe strategic value to expenditure that has no immediate or direct commercial benefit, but which enhances brand value, future access, etc. In a similar fashion, in a low-price oil environment, governments may also consider the benefit of foregoing some of their revenues from oil and gas exports, to invest in developing capacity and local content for the long-term benefit of the country.

Principle 3 – Ground objectives in a realistic assessment of resources and capabilities

There are no universally appropriate local content objectives or policies. These must be context specific. It is therefore critical to make a careful assessment of the resource endowment and the national capabilities for transforming these resources into wealth. These capabilities include skills, capital, infrastructure and governance. The key issue for the host nation is to ensure it makes a realistic assessment of its own potential, notably its local business capabilities.¹¹ Coupled with an

⁹ Isik, G., Opalo, K. O., and Toledano, P. (2015), *Breaking out of Enclaves: Leveraging Opportunities from Regional Integration in Africa to Promote Resource-Driven Diversification*, World Bank, <http://csi.columbia.edu/files/2015/03/Breaking-out-of-Enclaves-2-17-16-web.pdf>.

¹⁰ Melitz, M. J. (2005), ‘When and how should infant industries be protected?’, *Journal of International Economics*, 66(1): pp. 177–196.

¹¹ KAPSARC’s assessments of local business capabilities in East Africa consider two options: one is to randomly select a sample of firms that represent the petroleum supply chain; the second is to select the companies that make the sample. The importance is to have a list or sample that is relatively large and a questionnaire that targets key topics: absorptive capacity, innovation, adaptability, experience, financial capabilities, etc.

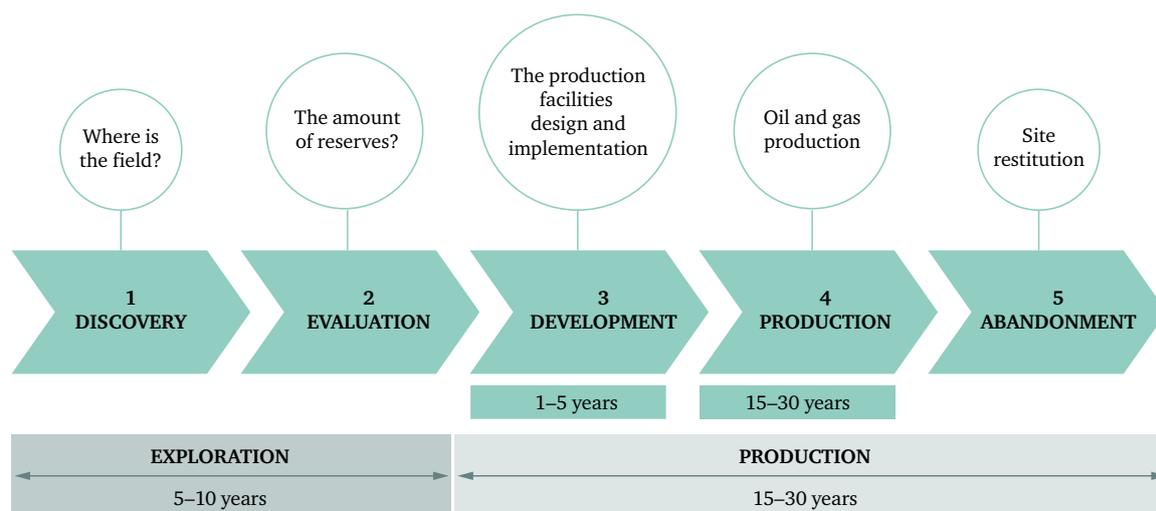
honest assessment of the oil and gas resource base, policy-makers will have an informed view of the country’s prospectivity (or attractiveness to explorers) and the timeframe for effecting linkages between the sector and the wider economy.

The degree of geological prospectivity and, eventually, the size of the reserves will help shape short, medium and long-term plans. The short-term objectives should be based on meeting the needs of existing projects, while the medium and long-term plans could take into consideration the development of capacity in readiness for different phases of the project lifecycle. In this regard, an even more rigorous assessment of such factors as dual or multi-sectoral use of resources should take place in order to prepare for the potential effects of cyclicity in project lifecycles and its eventual decline.

Information on the demand through the value chain and the qualitative aspects of the labour, goods and services requirements sits with the oil company operators, not with governments.

Understanding the value chain is a critical component of this principle. The assessment should include a mapping of the various activities at each stage of the project (see figure 1). Information on the demand through this process and the qualitative aspects of the labour, goods and services requirements sits with the oil company operator, not with government. Although assessments of national capabilities may be conducted in conjunction with international oil companies (IOCs), there is usually a mismatch between how the host nation perceives its capacity and what IOCs consider possible under local content. It is therefore preferable to have assessments made independently of IOCs and then validate these with the oil companies.

Figure 1: The main steps of an oil or gas field development project



Source: IFP School, http://www.ifp-school.com/upload/docs/application/pdf/2015-02/3_main_steps_oil_gas_field_development.pdf.

Principle 4 – Local content policies should be adaptive

What is a sensible and affordable local content policy one year can change the next as a result of evolving factors and circumstances. Examples of these changing circumstances include the gradual development of the domestic supply chains and skills base, the evolution of the resource base towards more geological certainty, or the external environment becoming more or less favourable. To allow for these changes policies will need to be reassessed periodically to ensure they are ambitious enough – maximizing the opportunities for the petroleum sector to naturally demand domestic goods and services and support national development goals and objectives – and still reasonable – not deterring investment or leading to ineffective local content investment. As such, local content policies should not be static, but dynamic, as projects move from exploration to production, and as more discoveries and/or projects are added.

While local content policy should be dynamic, it will not succeed if it falls victim to market uncertainty, resulting in ‘stop and go’ policies. The policy should be predictable enough so that IOCs are still attracted to invest in the country’s oil projects, even if the price is low and the government continues to support local content requirements.

In recent years, when oil prices rose rapidly, governments wanted to increase the proportion of revenues they received and adopted more strict local content policies. For instance, Nigeria ratified the Nigerian Oil and Gas Industry Content Development Act in 2010; Brazil’s minimum local content requirements at the exploration and development phases evolved from none, as of the early 2000s, to requiring 70 per cent of suppliers be located in Brazil for onshore blocks and about 50 per cent for shallow water exploration.

However, as prices decline, IOCs tend to focus on cost control. Local content requirements are an additional expense to oil companies if they need to source a product or service from a local company that is not as competitive as a foreign company in terms of price, quality or timeframe. Therefore, where efficiency would dictate that an oil company source goods or services internationally, local content forces it down a more costly route. When prices were high, IOCs generally accepted increased local content requirements since margins were still relatively robust. But today the context is very different and IOCs may try to negotiate ways to reduce the impact of local content clauses in contracts or lobby for a change (watering down) of regulations. Even where local content is stipulated in legislation, IOCs may want to use legal mechanisms, such as international or bilateral treaties, to reduce the cost of local content.¹² The choice for government is either to maintain or expand their efforts toward localization of the oil supply chain or offer attractive conditions to IOCs in order to encourage upstream investments.

Flexibility in policy is also necessary in countries with a low level of economic development and industrialization. Where the lack of human capital or business capabilities renders the completion of the project unrealistic based on existing policy, oil company operators may be allowed to modify their approach to the local content policy.¹³ But flexibility does not mean a ‘do nothing’ or a ‘voluntary’ approach. Different options can be studied to ensure efforts toward localization are adopted, including a progressive, time-bound approach. As human and physical capital improves, and the local businesses are better prepared to participate in the petroleum supply chain, the government can start tightening its local content policy. In this regard, what were once mandatory, but flexible and

¹² IOCs usually use reduction in headcount as an indicator of their efforts in cost reduction. Local staff, even though they may cost less than head office or developed country staff, might be sacrificed where local content and employment policies are weak or poorly regulated.

¹³ Of course, where Principle 3 is effectively applied, there will be no need to adapt policies on these grounds, since government will have assessed capabilities and in-country resources.

non-specific targets, then become more precise and strictly monitored, mandatory targets. In an ideal world, and as a measure of success, that tightening of the policy would become irrelevant as IOCs, which are naturally profit maximization entities, would make the rational decision to source locally since they should be able to acquire a more competitive service or product.

New petroleum producer countries are often expected to offer high levels of flexibility during exploration, to reduce risks to investors, which in practice has meant very little is achieved in terms of local content. As knowledge of the resource potential increases, and IOCs are more eager to enter, governments would then tighten the policies. But where stabilization clauses exist, it may be legally impossible to reverse the initial voluntary or soft approach to local content. Governments could devise a policy that exempts early entrants (the first IOCs that assumed higher exploration risks) but requires newcomers to respect mandatory local content policy.

Low capacity to analyse and negotiate, or weak decision-making processes and accountability, can be exploited and lead to inconsistent application of local content policy and the corruption of due process or public officials. In this context, producers might consider establishing a local content framework enshrined in national legislation, to avoid opening up terms for local content to negotiation. Such a framework would be applicable to all companies, with criteria for exemptions (or softer targets) in specific instances or flexible targets, according to evolving market conditions (similarly to royalty payments using an R-factor).

Principle 5 – Integrate the procurement strategy with local content efforts

In a company's operations, local content strategies sometimes reside in separate units or in the CSR department. This means local content is often a later consideration in the planning process. A requisite local content ramp up of supplier skills and capacity may be developed too late in the design and engineering process to provide timely local goods and services to the project. Operators have considered various organizational models for handling local content. Industry discussions recognize the risk that if local content sits with the procurement unit, opportunities for optimizing local content are missed. To avoid this different models are being considered to front-load strategic thinking in regard to local content and to better assess the trade-offs that companies must consider between different objectives, such as managing long-term risks versus minimizing costs.

To ensure early consideration of local content, governments can request that companies embed local content in their initial procurement strategy when preparing their field development plans. Integrating local content objectives into procurement strategies and engineering plans can significantly increase the impact of efforts to benefit the local economy.

5. The Decision Tree Process

The process for developing a local content policy should involve the following steps:



The first step involves a clear identification of country objectives. An important exercise at this stage is to map out the objectives and expectations of different stakeholders. For example, investors would expect clear and stable rules and policy stability. Local businesses would want some guarantees that they can compete on a level playing field with foreign companies, taking into account any disadvantages caused by operating in a country with low levels of development. Local citizens may expect to have access to the jobs offered by the new industry, or at least an education path that could give them a chance to participate in a workforce related to the petroleum sector, in the near or medium term.¹⁴ Finally, the government would want to balance the need to monetize the resource through exports and the pressure to create opportunities through lateral and forward linkages.¹⁵

In this section, we review the next steps of the decision tree process, involving different scenarios for the resource potential (the demand side of the equation) and for the economic preparedness of the country for linkages to the petroleum sector (the supply side). In each scenario, we discuss strategic capacity development options that can prepare the economy to meet the demand from the petroleum project (filling the gap).

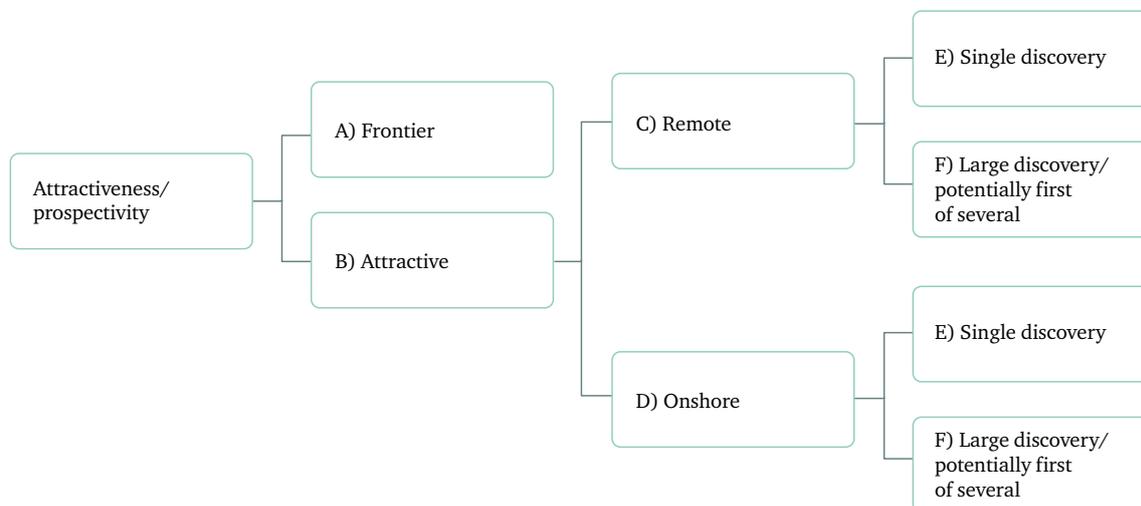
Decision tree for assessing the demand side of local content: the resource potential

Following Principle 3, the first decision tree is based on an assessment of the resource potential. The scale of activities and their duration are critical factors in the design and the implementation of policies to develop local content. The stage of development of the resource base is also a key factor and the petroleum sector activities during exploration, development and production bring different sets of opportunities for value capture and linkages to the national economy.

¹⁴ It should not be assumed that because a country has discovered hydrocarbons that its citizenry and government will decide to develop the resource. Some countries such as Costa Rica have opted to discourage oil exploration activities as potentially detrimental to the country's competitive advantages derived from enjoying one of the most diverse and pristine rainforests in the world.

¹⁵ Objective 1 of the Guidelines for Good Governance in Emerging Oil and Gas Producers (2016), Chatham House, reviews some of the considerations involved in devising a national vision for the development of the sector.

Figure 2: Decision tree for assessing geological type



Governments should assess where they stand on the geological decision tree. In each circumstance and at each stage of the process, from first exploration to production, governments should ask ‘what opportunities are there to develop the types of skills, goods and services that are needed, and when are they required?’ Also, in view of focusing on local content policies that create value beyond a specific project, as outlined in Principle 2, governments should ask, ‘what skills and supply developments create value in this set of geological circumstances?’

In each circumstance and at each stage of the process, from first exploration to production, governments should ask ‘what opportunities are there to develop the types of skills, goods and services that are needed, and when are they required?’

Governments should request foreign oil companies provide early data on their needs throughout the project development lifecycle and share this data with learning institutions and local suppliers. Training times and costs differ, from construction workers and electricians to specialist engineers and geologists. Governments and training institutions would need to know how many of which type are needed. Geologists and specialist engineers (those trained at the tertiary-education level) are by far outnumbered by skilled and semi-skilled construction tradesmen, metal and mechanical tradesmen, electrical and electronic tradesmen and other experienced heavy industry machine and plant operators. None of these are ‘low skilled’ and their training paths (post-secondary education) range from two to five years. Most training therefore requires considerable front-end loading, but some training has greater potential for transferable skills across sectors.

At the licensing stage, oil companies can be asked to provide details on their procurement strategy and annual updates to local suppliers. At the pre-FEED (front-end engineering design) stage, operators can produce estimates of demand and cost of goods and services required, as they will have received these from suppliers, engineering companies and benchmark analyses of their own or industry experience. During the FEED stage, companies elaborate their procurement plan and can provide forward looking plans outlining their needs over the stages of the project. At the point of final investment decision (FID), companies develop detailed engineering, procurement and construction (EPC) plans, which provide detailed estimates of costs and timelines and they will typically give suppliers a limited

timeframe of only a few weeks to bid for the work.¹⁶ Governments from emerging producer countries would benefit from guidance in order to request the most useful data for evaluation. Government should also prepare their own estimate of expected petroleum sector demand for skills, goods and services (with external assistance). This independent assessment will be a useful counterpoint in negotiations with companies.

At each step in the geological decision tree, governments should also assess whether the broader market environment is conducive. Commodity cycles and broader economic cycles affect foreign oil companies' attitudes to investment. In a low-price oil/gas environment or when there is uncertainty regarding future oil/gas demand, investor oil and gas companies will be focused on optimizing project delivery and lowering costs. This has an impact on their approach to local content development.

These following categories are simplifications of complex national circumstances.

1. *Attractiveness and Prospectivity: Countries in the exploration phase may identify their resource base as either:*
 - A) *Frontier: High-risk exploration frontier for political, geographic or geological reasons.*
 - B) *Attractive: Prospectivity is recognized by the industry and oil companies are keen to explore.*
2. *Remoteness of petroleum activities in terms of physical distance to business and industrial centres and of technical complexity:*
 - C) *Offshore or remote onshore.*
 - D) *Onshore.*
3. *A discovery may be:*
 - E) *A single discovery: At present the country can count only one discovery and therefore a project of definite scale and duration (exploration success may later move the country into type F).*
 - F) *A large discovery or potentially the first of several: The scale and duration of the project is significantly greater than in type E and there are expectations of further discoveries to increase the resource base.*

If Frontier (geology type A), exploration activities will be limited. A key focus should be on developing knowledge about the resource base.¹⁷ In a frontier country with no history of oil exploration, the government should hire a firm to evaluate its geological potential. This could be considered too speculative by a risk averse government, but it is important that governments know the value of their assets. Commissioning seismic studies will enable governments to have knowledge of and control over the resource base from an early stage. That data should be owned by the government and offered or sold to interested oil companies. If, on the other hand, the government has a history of exploration, it can develop its own capabilities to evaluate its geological potential. In either case, data management should not be outsourced to IOCs. It is preferable that a government agency invests time, effort and resources in developing the capabilities to know and understand its geological potential. Better data

¹⁶ Marcel, V. (2016), *Guidelines for Good Governance in Emerging Oil and Gas Producer Countries 2016*, Research Paper, London: Royal Institute of International Affairs.

¹⁷ It makes sense for the governments of such countries to invest in collecting geological data before licensing so as better to understand the value of what they intend to license, and to reduce the risk for investing companies. Governments should also actively explore funding options for the acquisition of richer data about their own acreage. (Marcel (2016), *Guidelines for Good Governance in Emerging Oil and Gas Producers 2016*).

also decreases risk, and this is particularly warranted in a low-price environment. Government can get support from experienced international practitioners for developing that knowledge. Donor countries can finance investments to map the geological potential of a region. Countries may also draw on the donor country's expertise and benefit from technology and skills transfer.

If the country has a potentially attractive resource (geology type B), the government should plan ahead and train the workforce required for initial upstream activities.

Alternatively, if the country has a potentially attractive resource (geology type B), the government should plan ahead and train the workforce required for initial upstream activities. Seismic studies create employment opportunities for labourers, surveyors and electricians, for example. During drilling, opportunities will arise to support a wide range of activities such as the provision of fluids and chemicals, repair and maintenance of equipment and supply of manifolds, tools, equipment, logistics and other services such as HSE services. They will benefit from collaborating with oil companies to invest in front-end loaded skills development. Front-end loading is a methodology that aligns an operator's technical and business goals to create a more comprehensive development plan and smarter project execution.

If the country has an attractive resource (type B) and its operations are remote (type C), it is new to the petroleum sector and the gap between the requirements of the project and the readiness of the economy would be hard to overcome in the short or medium term. Governments must be careful to manage public expectations regarding the extent and potential of local content in offshore exploration projects, particularly those in deep-water areas. They must communicate truthfully about geological and project uncertainties and the extent of expected impact of petroleum activities on the local economy.¹⁸ Similarly, for exploration activities onshore in remote areas (e.g. Amazon basin, Turkana), it will be a challenge for communities to fill the jobs, sometimes even those that are low skilled and require a limited amount of training (e.g. truck driving). The first step would be to map out the project's activities with the oil company, in order to identify in which activities the country's and community's people and local businesses could participate.

If the country has an attractive resource (type B) and it is located onshore (type D), and at the exploration stage, companies may commit to local content for those goods and services that are already available and meet required standards. They may not be enthusiastic to invest heavily in capacity/supplier development. However, they will require some skills, infrastructure and goods that can be supplied locally. This is an area where front-end loaded social investment can contribute to the development of local content. The key is for government negotiators to have a clear view of national objectives and capabilities and to negotiate local content provisions with the partner companies at the time that the licence is being issued.

Early planning for job training can reduce social tension between the local community and the 'imported' workforce (even if they are nationals). That said, early workforce preparation presents a risk in terms of unmet expectations. If the seismic studies do not prompt exploration activity or if the exploration does not lead to a commercial discovery, there will not be a project to generate jobs. Nevertheless, even basic safety training is already a value-added skill for communities living in traditional rural areas.

¹⁸ Refer to Objective 4 'Earn and retain public trust and manage public expectations' of Marcel (2016), *Guidelines for Good Governance in Emerging Oil and Gas Producers 2016*, for detailed recommendations on managing expectations.

Post discovery

If the discovery is remote (type C) in relation to the business and industrial base of the country and is a single discovery (type E), there will be fewer opportunities for the existing national supply base to interact with the petroleum project. Opportunities for local content will mainly arise in the time-limited construction phase. Priority must be given to: i) minimize the negative impact of the project on the local populations living nearby, and ii) ensure rents generated from the resource are used to maximize societal welfare of current and future generations.

In the case of the discovery being remote (type C) and being a large discovery or potentially the first of several (type F), pressure would be given to ‘localize’ some of the activities and construct facilities onshore, rather than offshore. For example, governments prefer to build LNG terminals onshore (as is the preference of the Tanzanian government) since they offer better opportunities for local content. However, governments will need to carefully weigh the costs and benefits of these policies and the trade-offs in areas such as time to first production versus revenue flows.

If there is only one project (with a known lifespan), the appropriate local content policy will focus on ‘dual-use’ applications.

In terms of maximizing linkages between the local businesses and the oil/gas project over time, fostering the development of the ‘right’ capabilities early on and maximizing the learning-by-doing and partnering process will enhance the competitiveness of the local firms and workforce. On a broader level, national development plans should factor in the economic transition from an agrarian economy to one dependent on oil/gas revenues.

If the discovery is onshore (type D) and it is a single discovery (type E), the oil and gas sector is going to be small relative to the overall economy. If there is only one project (with a known lifespan), the appropriate local content policy will focus on ‘dual-use’ applications. It is more important to develop capabilities that will be useful to the country after that discovery is exhausted and to enhance and utilize those capabilities that are already in existence locally. Focussing on low-hanging fruit – for example, training construction workers, plant and machine operators, industrial carpenters, electricians and other skills to common standards – is beneficial to both industry and the country. These skills are built on a secondary education and take less time to develop than those of a petroleum engineer or industry specialist welders and technicians (which require several years of post-secondary education training and practical experience).

The policy will seek to maximize the economic benefits from capacity development related to petroleum activities, without creating dependencies on the sector. Efforts to minimize dependency on the oil sector should always be made, regardless of resource base. However, in this instance, there is a greater urgency to minimize this dependency. Therefore, instead of training a national for a skill that can only be used by the petroleum sector and which risks becoming redundant after petroleum activities cease, a national will be trained in a skill that can be used by the petroleum sector *and* other sectors. That said, there are some technical petroleum skills and services for which the demand crosses over the various phases of a field’s life. Such skills and services include engineering, procurement and construction services, logistics, production testing, operations and maintenance services, and well servicing. The life span of a field can easily be 20–30 years, which is enough to make careers for a whole generation of workers (albeit a limited number). Timely industrial and skills development is especially important in a country with only one or two fields. At the stage of FID it is

already too late to engage potential local suppliers, in terms of helping them access finance and build the required capacity for major projects. These matters should be incorporated well before FID is reached. Procurement plans can be shared at the licensing stage and, in greater detail, at the pre-FEED and FEED stages, providing estimates of demand and costs.

Regional cooperation could be developed to share scarce, specialized skills and services for the oil and gas industry. This strategy creates a larger and longer-term market for the development of specialized skills. Neighbouring producers can pool specialized technical capacity, through a roster of petroleum lawyers, for example. Specialization of skill development could be based on historical legacy, existing areas of expertise, geographic or other competitive advantages. There are potential synergies for skills sharing that could be developed across West Africa, for instance. Though Ghanaian and Nigerian academics are engaged in discussions to develop a regional approach to local content, political interest and support has been lacking. Regional organizations such as the African Union or ECOWAS may play a role to take such initiatives forward and overcome existing regional competition.

Another issue to consider at this stage (and which may also be relevant in geology types C, D and F, below) is whether slowing the pace of project development would be warranted, to allow more time to build a stronger legal and regulatory framework to manage revenues and develop local capabilities more effectively. There is certainly merit to this approach, but it also carries risks. First, there is also no guarantee the slow build-up of capacity and regulations would be more effective. Project delays impact the net present value (NPV) of expected revenues and the country may also acquire a reputation as a 'difficult country in which to do business'. Moreover, a slow pace keeps the scale of the resource base smaller (because further exploration is on hold) and limits the scale of the project's demand for goods and services, reducing the potential for linkages.

On the other hand, if the country proceeds at a swift pace to develop the discovery, early revenues can be used to address some basic social or security needs. But without the necessary national vision for development or monitoring and oversight institutions and rules in place, there is a greater risk that revenues will not be used as productively. A 'third way' could entail a moderate pace that aims at building capacities but does not stop development, and introduces regulations signalling to the oil companies that local content requirements will tighten as capabilities improve.

If the discovery is onshore (type D) and large (type F), the petroleum sector will potentially have a much longer life than if it is a single discovery (type E), and its scale relative to the economy will be larger. The development of more sector specific skills will be justified and the local content policy should be focused on developing linkages with and leveraging existing services and industries. Governments should consider an incremental build-up of sector specific skills. There are often 'base skills' on which 'specific skills' can be built. For example, a broadly trained mechanical fitter has the foundation to develop further into a specialist mechanical technician and become a specialist mechanical engineer. The industry will need good quality broadly trained mechanical fitters during the construction phase and these skills should be developed first.

It is sensible in all cases to develop skills, goods and services that are transferable, because the petroleum sector is a cyclical business. The level of activity of the sector fluctuates, which exposes domestic businesses and labour to greater risk of redundancy in a downturn. However, for cases where the oil and gas sector is likely to be large relative to the overall economy and to have a longer lifespan, a strategy that develops oil and gas sector specific capacity is justified, even before production begins.

This may take the form of:

- Specific training either in country or abroad (including time seconded to oil companies to gain experience).
- In the case of pre-production countries, efforts should be made to develop public sector and private sector training to produce an increasing number of skilled workers for the oil and gas industry, with projects becoming largely manned by local employees, and supplied by local goods and services. This can have a strong multiplier effect into the local economy.
- Building up a supply chain and service sector specific to projects. Clearly this is best done by the private sector in a well-diversified economy, but may need encouragement (by industry-led cooperation and initiatives) in some less developed economies.
- Providing fiscal incentives to local companies entering the supply chain. The issue is not only to 'protect' local companies, but also to recognize that many may not have the financial capabilities to enter into an industry they do not know.
- Creating a supportive environment for the creation of indigenous oil and gas companies. Governments of emerging producers could consider strategically whether there is merit in being less reliant on foreign oil companies in the longer term – Nigeria, for instance, nurtured the establishment of indigenous oil companies after 2010. This strategy presents the risk of enabling 'shell companies' with connections but no capacity, especially in the early days, but can also build real indigenous capacity. In some countries, marginal bids (for access to blocks with modest production potential) are offered under preferential conditions to local entrepreneurs.
- Encouraging foreign oil service companies to set up a production process in the country, as long as their process adheres to strict local content regulations.
- Development of associated downstream industries, particularly if there is associated gas (e.g. fertilizers, petrochemicals, refining).
- Developing industries with application to the oil and gas sector but wider potential (e.g. IT, maritime services, logistics, engineering).

If the discovery is expected to be such that it would transform the economic structure of the country by its size, then the government should plan an oil development strategy for the long term. In this case, careful studies of the value chain should be conducted, identifying the activities in which the country may have some competitive advantage, and the areas where crossovers into other economic activities can be maximized.

It is usually not appropriate to replicate global supply chains locally. Instead, niche activities that address segments of the supply chain can be attractive investments. For instance, Trinidadian oilfield service companies have largely focused on specific activities where they can compete with larger foreign companies. Tucker Energy Services, for one, began by offering cementing and cased hole wireline services in 1939, expanded into slickline services in 1967, coiled tubing services in 1978 and was able to offer hydraulic fracturing in 2012. It could not match the research and development of larger players and instead opted for importing and adapting existing technology, and focused its research on technologies to support its services when there was no pre-existing technology.¹⁹

¹⁹ V. Marcel, A. Kennedy, Z. Thompson (2016), *Unsung Workhorses of the Oil Industry; Oilfield Services Companies*, KPMG Global Energy Institute, <https://home.kpmg.com/xx/en/home/insights/2016/03/oilfield-services-companies-unsung-workhorses-oil-industry.html>.

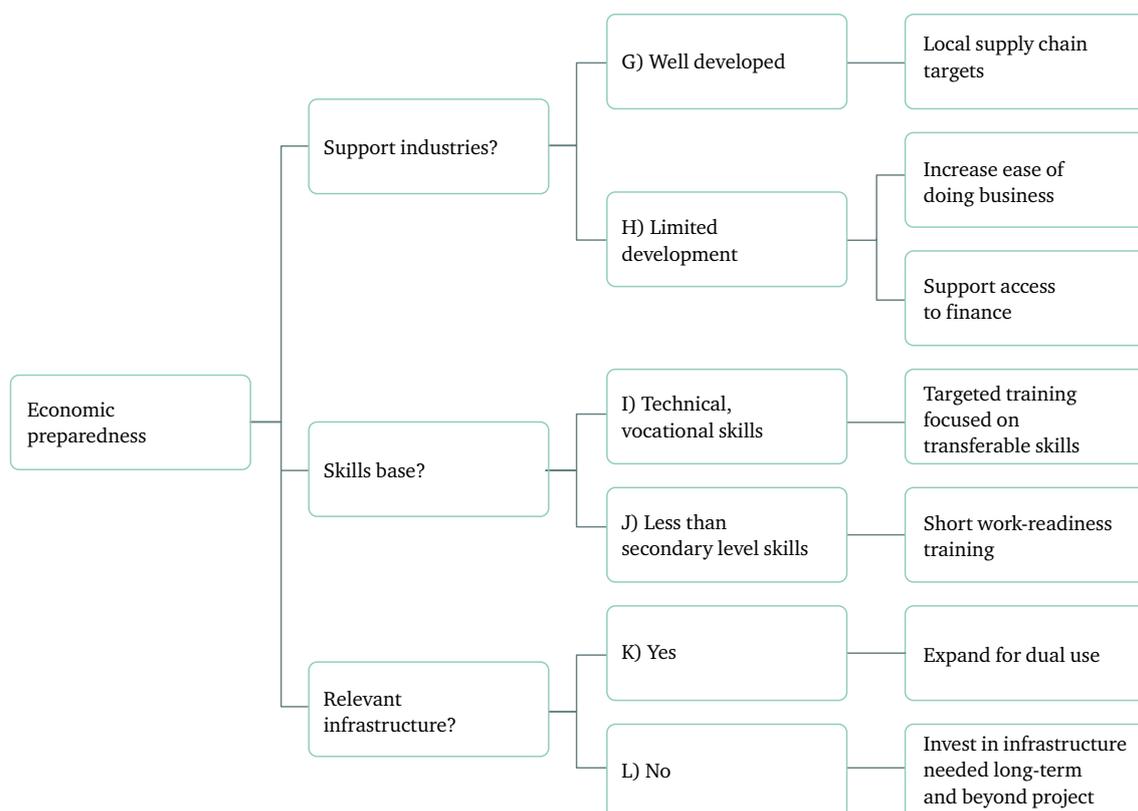
As the learning curve improves, the competitiveness of the country would increase – since geography forces the oil companies to operate in the location where the resource is located. As the project develops, infrastructure development should also be a priority. Again the development of the infrastructure (roads, airports, ports) should be aimed at reducing costs to the project, but also allowing for crossovers into other economic activities. Indeed, a modern airport infrastructure facilitates the export of flowers, for instance.

Decision tree for assessing the readiness of the economy to provide the local content

The earlier decision tree analysis focused on assessing the expected level of activity of the petroleum sector and its demand for national skills, goods and services. It also examined the proximity of these activities to the country’s centres of economic activity. This section tackles the question of proximity of the petroleum projects in regard to the country’s economic readiness. The decision tree outlined here examines the capacity of the economy to interact with and support the activities of the petroleum sector. Greater readiness of the economy allows more ambitious local content targets in the short and medium term.

For each step in this decision tree identifying the readiness for local supply, the key strategic question that follows is ‘what gaps between demand and supply should and can be addressed?’ The answer to that question is guided by the country’s strategic economic objectives and conditioned by the potential of the petroleum sector demand. The next step is a capacity development plan to address the gap, where this is most feasible and makes most sense from a development perspective.

Figure 3: Decision tree for assessing readiness of the economy



1. *Are industries available nationally to meet the needs of the petroleum sector?*

G) Well-developed support industries exist, such as hospitality, construction and manufacturing.

H) Limited development of support industries.

If the economy has well-developed support industries (type G) to meet the needs of the petroleum sector, efforts should be made to leverage that capacity and source locally. Building a local supply chain and service capability is easier in a large economy (Brazil, for example) and enables local content requirements to be more extensive.

Government and operator should work together to identify the demand for goods and services, available local capacity and services, and a strategy for training and supplier development to close gaps, as determined by national or local development priorities. The extent to which efforts to bridge the demand-supply gap are warranted depends on the analysis made in the first decision tree evaluating the scale and duration of the petroleum activities. Even in large economies, governments should consider that if the petroleum project is geographically remote (type C) from the industrial and service bases (or offshore), as described in the previous section, then it will be more challenging for the project to draw on some of the existing supply chain.

A key issue here is to identify which entity, government or operator, pays for covering any shortfalls in the supply chain. The international oil companies should not object to clarifying their needs and offering the opportunities for jobs and contracts to locals that meet their quality standards. They can provide demand data in their work programmes and project pre-FEED or FEED, in various degrees of detail. However, they will be reluctant to finance the cost associated with bridging any gaps between needs and available capacity (without those costs being repaid during production).

A key issue here is to identify which entity, government or operator, pays for covering any shortfalls in the supply chain. The international oil companies should not object to clarifying their needs and offering the opportunities for jobs and contracts to locals that meet their quality standards.

If the economy is unable to offer support industries (type H) that meet the needs of the oil and gas project, and the project is remote (type C), modest requirements for partner companies should be applied, as the supply chain gaps will be greater. Governments can investigate the potential for basic transport services to the project site to be provided by local suppliers and for catering services to be sourced domestically. Greater economic impact may be achieved through a strategic use of revenues from the project. When the petroleum project is onshore (type D), flexibility (in terms of areas of focus and targets) in local content policies is preferable. The focus of initial capacity building may be on industries outside the petroleum sector, infrastructure or institutions. For instance, military procurement often uses 'offsets' where suppliers are required to locate part of their supply chain locally or cause one of their suppliers to bring part of their business to the country, even if unrelated to the industry. When dealing with large discoveries or what is potentially the first of several (type F), the government should strategically assess what industries could be developed to foster supply chains over time. It could conduct studies in cluster development and growth poles.

If the economy is ill equipped to supply goods and services to the petroleum sector (type H), the government should assess whether the national supporting environment is conducive to the emergence of these industries. The ease of creating businesses and doing business will affect what is available to support the oil and gas sector.

If no, government policies and regulations should adapt to support the domestic private sector. Possible government policies in this regard could target:

- Enhancing the ease of doing business, simplifying the bureaucratic requirements for the creation of local private sector companies. This will be beneficial to the current economy and will help prepare the country for future opportunities that arise to serve the petroleum sector.
- Introducing fiscal incentives to encourage the creation of small and medium-sized enterprises. The impact of the fiscal incentive for petroleum supply chains should be weighed against that of other industrial sectors that may already be more successful or have better chances of succeeding.
- Developing the infrastructure (roads, airport, telecommunications) that enables the private sector to provide goods and services. The focus of infrastructure development should be creating synergies between the petroleum project and other economic activities (for example, opening access to new agriculture land or tourist activities).
- Informing the private sector about the standards and accreditations required by the petroleum sector for the delivery of goods and services.
- Encouraging the oil and gas companies to co-operate to save costs and create markets for standardized products and services.
- Providing reliable information in a timely manner, so as to allow for good investment decisions by local companies. Clarifying the areas of goods and services for which locals might be afforded preferential access.

If support industries are limited (type H), government should also assess whether there is a strong domestic financial services industry. Access to capital is an important enabler for small and medium-sized businesses that would supply the oil and gas industry.

If yes, government can support the education of domestic banks about the oil and gas sector and help them understand the risks involved. It can provide information about the expected demand for goods and services from petroleum projects.

If no, what alternatives are available to local participants? To what extent can governments actively seek support from inter-governmental financial institutions and other similar sources of development-targeted capital? Are there measures to encourage the domestic financial services industry to partner with international counterparts? In Ghana, for instance, the local content law stipulates that contractors must maintain bank accounts with an indigenous bank and transact business through banks in Ghana. There may also be scope to develop financial tools using oil company invoices as guarantees to allow local firms access financing. Governments can develop financial mechanisms in coordination with local banks to reduce the cost of capital for local firms (levelling the playing field with the foreign supplier).

2. Does the workforce have the skills required by the petroleum sector?

I) Secondary and tertiary level technical and vocational skills exist. The workforce offers general skills, tradesmen and craftsmen (such as welders, fabricators, electricians, plumbers, mechanics), bookkeepers, administrators, and perhaps the potential to build up a supply chain and service capability. Key here is not whether the technical vocational education and training institutions exist, but what level of general and specific competencies they can provide in training and how practically oriented and current that training is.²⁰

J) Less than secondary level skills exist.

If the level of competencies is high (type I), governments can assess skills availability in each trade or profession and design targeted local content requirements to raise the level of national participation in the petroleum sector. To do so effectively, governments would need to know what skills are required and at what level, which requires a demand-driven technical vocational education training (TVET) assessment. In practice this is rarely done.

If the standard of the skills base is below the secondary level (type J), closing the gap will be more difficult. The focus should be on short work-readiness training. If training investments fall under the portfolio of the oil company's CSR department, their impact and scope will likely be limited and at the mercy of the company's budget and goodwill. It would be important to address skills development through front-end loading and bringing in third parties with an interest in skills development serving the petroleum and other sectors.

Companies might calculate that the benefits of training nationals may offset direct costs. In this case, the reach of the training would be limited to the project needs. If broader training and gap-closing efforts are imposed on the oil companies, they will demand compensation – via tax breaks, lower royalties, for example – to finance these efforts. The bottom line is that the cost of closing a skills development gap will not be borne by IOCs. Options therefore include the incorporation of contractual training obligations agreed with the IOC and recognition of such financial commitments as legitimate recoverable costs for tax purposes.

Ultimately, training beyond the direct requirements of the project should not be a responsibility of oil companies, but of the government. However, oil companies should assist by providing early assessments of their skills needs. Governments can then work with technical schools and universities to assess if the training offered is adequate. If national training is non-existent or deficient, the oil company can offer a training programme or can enlist the support of its country of origin (through programmes at the embassy or foreign aid activities).

In the instance of both technical and vocational skills being limited (type J) and there being a single discovery (type E) – and if the scale of the petroleum sector is smaller – it may be better to focus on training and apprenticeships in skills with wider applications in the economy.

The training and capacity building efforts will have more of a petroleum sector focus if the resource base and expected scale and duration of activities in the petroleum sector are large (type F) – as per the outcome of the analysis in the first decision tree. In such cases, it may well be worth establishing an engineering college, with courses designed in collaboration with partner companies to ensure a good match between graduates and job opportunities.

²⁰ For example, are metal workers roughly at City and Guilds level 2, or at levels 4–6, with the difference being years of additional training and foundational skills development?

3. *Is the relevant infrastructure in place to enable projects to go ahead?*

K) Yes

L) No

If yes (type K), there are a number of issues to consider:

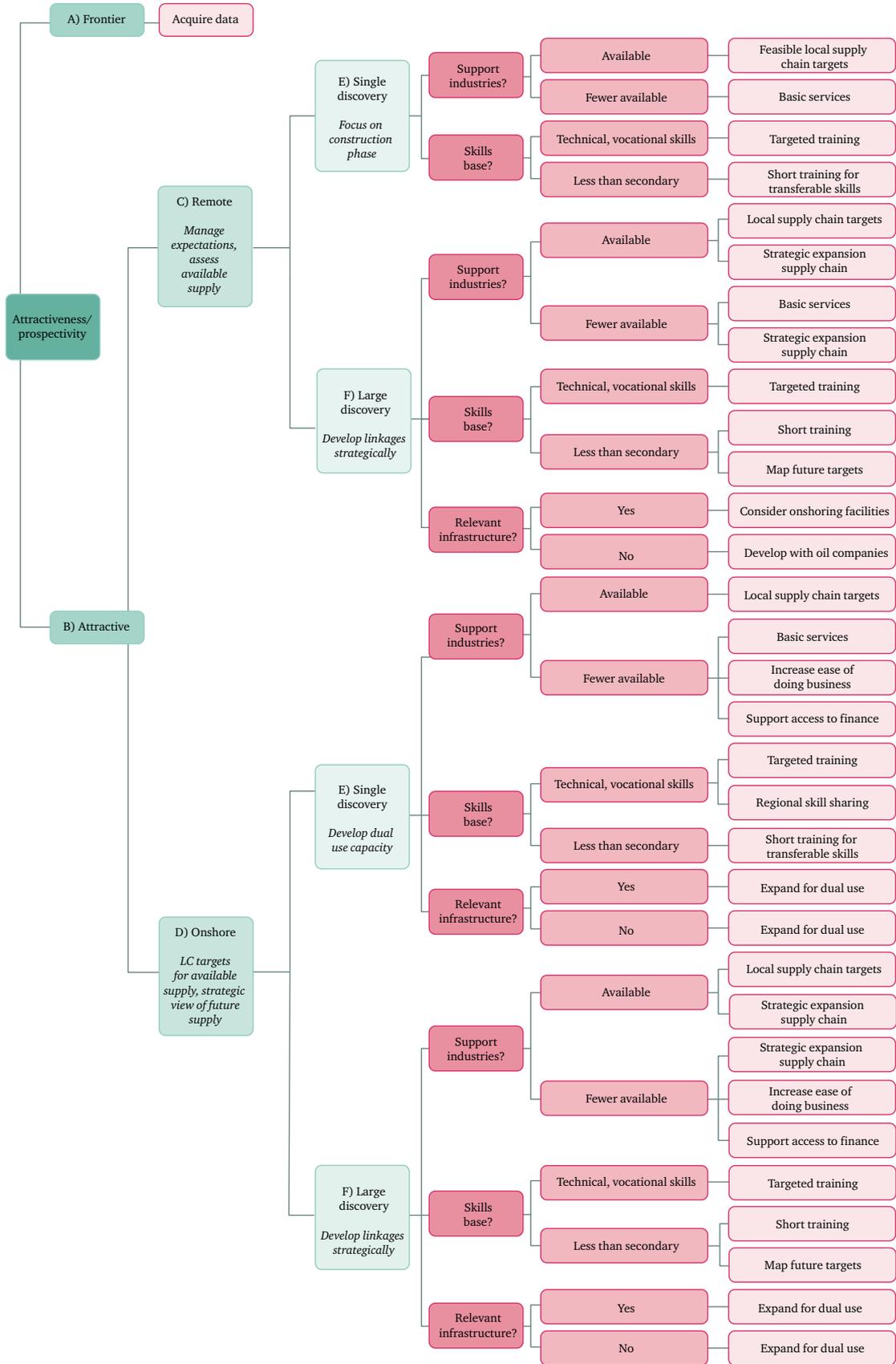
- The state and capacity of such infrastructure to support the projects and, by implication, the necessary work that will be required to bring it up to standard.
- The various purposes for which such infrastructure can be utilized and the potential opportunity cost of incorporating new projects.
- The availability of enabling/supporting legislative and regulatory instruments for access to such infrastructure if they are natural monopolies.
- The maintenance, environmental and sustainability implications of adding new projects to such infrastructure.

If no (type L), could its provision (or part thereof) be provided by partner companies? Companies find it more straightforward to justify spending that is directly linked to project infrastructure, for example, access roads or electricity grid extensions. Governments need to exert leverage in deciding infrastructure development in order to both support the project and create opportunities for broader economic development. When companies select the design and route of infrastructure, their focus is on cost minimization. They may miss opportunities to create linkages and maximize economic development. For example, in the development of infrastructure to support an LNG project, a gas pipeline designed to go from the production area to the gasification port may miss the possibility of moving gas to areas that are remote but would have potential for development if they had access to energy. This is what Rodrik refers to as ‘coordination externalities’: businesses do not invest because they require electricity or roads to support the investment, and investors do not invest in supplying electricity or roads because they do not see business investing in expanding their production capacity, creating a demand that would justify additional roads or power supply. Profitable new industries can fail to emerge without the necessary and simultaneous investments upstream and downstream. Government will need to coordinate such investments. Its focus should be on building infrastructure not from a project centric perspective (lowest cost pipeline route for example) but based on a long-term national development vision.²¹

Companies are unlikely to be willing to pay for large-scale public infrastructure, even in relation to a large discovery (type F) – as demonstrated in Tanzania. Larger infrastructure investment may require some sort of consortium funding (e.g. public-private partnerships, multilateral support), which is particularly adapted for dual use infrastructure and may benefit development more broadly. If there are several petroleum projects, there is the possibility of grouping the burden of infrastructure development across projects. The government may still need to support this financially and coordinate the parties.

²¹ Rodrik, D. (2004), ‘Industrial Policy for the Twenty-First Century’, KSG Faculty Research Working Paper Series RWP04-047: <https://research.hks.harvard.edu/publications/getFile.aspx?id=146>. According to Rodrik, the government’s focus should also be on supporting activities that are new to the economy, rather than those that are already established.

Figure 4: Full local content decision tree



Implementation, monitoring and review

Governments should clearly define terms used (such as Local Content, Local Company/Supplier, Locals/Nationals) and ensure that activities and targets are measurable, in order to enable a monitoring, reporting and enhancement process. Governments need a simple and standardized measurement and reporting system, to support ease of implementation and also to minimize the burden for investors. Further research is needed in this area, to develop key indicators to measure compliance and success of the policy that are easy to implement, easy to administer and easy to understand.

There should be regular reviews with the partner companies and other supporting agencies (such as training institutions and industry associations), and policy and targets should be amended where necessary. This process will work best where there is clarity at the time of the licence being issued, ongoing good communication between the national oil company (NOC), the ministry and the partner companies and also good in-country coordination (for example, between the energy, transport, education and commerce ministries).

To increase coordination and efficiency, a central planning agency can be a good candidate for driving this process. Central planners can provide a holistic view grounded in the national economic vision. There may be capacity issues to consider, but the process can identify means to address capacity gaps. Their efforts should be supported by the political leadership, driving the agenda, and challenged by civil society, as a check on bureaucracy.

6. Conclusion

This paper draws a map to simplify the complex considerations that come into play when designing local content policy in an emerging producer context. Better than best practice guidance, it offers context appropriate advice. But the real challenge comes in implementation. Further research is necessary to develop the tools to support policy-making in this area.

Governments of emerging producer countries would benefit, specifically, from guidance on how to make qualitative assessments of both demand and supply, as suggested throughout the paper. It is not straightforward to assess local capabilities in relation to the typical demand for labour as well as goods and services of the sector. They would need a competency-based TVET, to assess their skills, and reliable labour market data, in order to assess the supply side of the equation. To understand the demand side, they would need to know what skills the oil and gas sector typically needs, what the associated training paths are, and where and to what extent these skills overlap with the needs of other sectors, including civil engineering/construction, energy sector more broadly (e.g. downstream, midstream), infrastructure and utilities, and the green economy.

This paper sets out an approach that serves as a basic roadmap, to be refined and expanded upon, to reflect more accurately oil and gas projects' typical demand for goods, services and labour. Guided by this decision tree and supported in its implementation by assessment tools, governments would have greater chances of developing effective local content policies and meeting the expectations of their citizens. They would also be better positioned to ask more of oil companies.

In a context of low oil prices, governments have lost some leverage in negotiations with oil companies. With new exploration delayed in many countries and final investment decisions postponed in others, governments may be encouraged to think that local content requirements are not appropriate. But it is in fact an opportune time to put a value creation proposal to the companies that are going ahead with investments. It is of mutual interest to investors and host countries to develop timely goods, skills and services to meet the needs of petroleum projects and to increase public support of projects and governments. A strategic approach to local content development and regulations enables that.

This approach stands in contrast to the local content policies that impose a sector wide target for local content, matching or upping the neighbour's target. Even with nominally lower local content targets, local content policies grounded in a rigorous and honest assessment of the country's strengths and weaknesses will be more impactful in terms of creating in-country value. Governments will be creating a more attractive environment for investment than if they had imposed an arbitrary target of local content.

The current slowdown of upstream activity also gives producers the time and space to reflect on national strategic goals, weigh the opportunities and risks of pursuing different policies. Offering a clear framework for investment reduces risk and this will be increasingly important in an age of low commodity prices and relative resource abundance. Governments should also factor in ease of doing business (e.g. corporate governance, weight of bureaucracy, independence of the judiciary, efficiency of the indigenous private sector), which will be considered by potential investors and partner companies as they review project opportunities. This is as important, if not more so, for the local companies.

Glossary

City and Guilds level: City and Guilds qualifications cover a wide range of sectors. Vocational qualifications range from entry-level to level 3, with the latter involving more complex tasks and beginning the development of supervisory skills. In many professions, level 3 is the benchmark to be considered competent.

Corporate social responsibility (CSR): Also called responsible business, CSR is a form of corporate self-regulation through which a business monitors and ensures its active compliance with the spirit of the law, ethical standards and national or international norms. The aim is to increase long-term profits and shareholder trust and reduce business and legal risk by taking responsibility for corporate actions. CSR strategies encourage companies to make a positive impact on the environment and stakeholders including consumers, employees, investors and communities.

Cluster development: Cluster development is the economic development of business clusters. A business cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters are considered to increase the productivity of companies so they can compete, nationally and globally.

Downstream: The downstream sector commonly refers to the refining of crude oil and the processing of natural gas, as well as the marketing and distribution of products derived from crude oil and natural gas.

EPC: The engineering, procurement and construction (EPC) phase of a petroleum project is also known as the execution phase. It normally follows the FEED phase.

FEED: Front-end engineering design (FEED), also referred to as front-end loading, is an engineering design approach used to control project expenses and thoroughly plan a project before a fixed bid quote is submitted. It involves robust planning and design at the front end of a project, when the ability to influence changes in design is relatively high and the cost to make those changes is relatively low. The FEED is used as the basis for the EPC phase.

FID: The final investment decision (FID) triggers the execution and the EPC phase of a petroleum project.

Flaring: When crude oil is produced, raw natural gas associated with the oil is brought to the surface as well. Especially where there is a lack of pipelines and other gas transportation infrastructure to capture the associated gas it is burned or vented, as waste or unusable gas.

Growth poles: Economic growth takes place around a specific pole of core industries around which linked (or cluster) industries develop, mainly through direct and indirect effects.

In-country value: The total expenditure retained in-country that can benefit business development, contribute to human capability and stimulate productivity.

Net present value (NPV): NPV is the difference between the present value of cash inflows and the present value of cash outflows. NPV is used to analyse the profitability of a projected investment or project.

Prospectivity: A prospect is an area where more geological data has been acquired and its feature is more robustly defined. Prospectivity refers to features that present more attractive mineral exploration data.

R-factor: An R-factor is the ratio of cumulative receipts from the sale of petroleum to cumulative expenditures. This ratio is initially zero during exploration as there is no sale of petroleum while there may be considerable expenses. The larger the R-factor, the more profitable the operation. The royalty rate or the government's share of production may rise with an increasing R-factor.

TVET: Technical vocational education and training (TVET) is defined by UNESCO as 'those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic life'.

Upstream: The upstream sector includes searching for potential underground or underwater crude oil and natural gas fields; drilling exploratory wells; and subsequently drilling and operating wells that extract crude oil and/or raw natural gas.

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Cover image: A worker stands on a platform next to the Tullow Oil Plc Prof. John Evans Atta Mills Floating Production Storage and Offloading (FPSO) vessel at the Sembcorp Marine Tuas shipyard in Singapore, January 2016.

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