

Harnessing the Gains from Natural Gas: Opportunities and Challenges for Tanzania

Key Policy Messages

This note identifies ten key policy messages for the POPC and Government of Tanzania emerging from the POPC-MEM-BoT-IGC seminar and meeting on “Harnessing the Gains from Natural Gas” held in Dar es Salaam and Zanzibar on 12 and 14 December respectively. This note is not meant to be comprehensive but should be read in conjunction with the presentations made at the Dar es Salaam meeting and the summaries of both meetings prepared by the IGC and POPC Steering Group.

- 1. First, a clear distinction needs to be drawn between developments in the established on-shore natural gas field – which will occur quite rapidly – and the development of the deep offshore reserves.** The completion of the new Mtwara to Dar es Salaam gas pipeline offers the prospect of rapid improvements in the reliability and cost of domestic power generation regardless of what happens further offshore. *In the short-run, government must seek to secure the gains from the increased supply of natural gas by addressing as a priority the weaknesses and bottlenecks in power generation including issues of energy pricing, billing and the distribution network.*
- 2. In terms of the development of offshore reserves, the long lead time for the development of this sector is both an opportunity and a challenge.** Government has the opportunity to invest in research and planning to ensure that critical decisions are taken with full information and good analysis and that the institutional and policy regime put in place for the sector blends best practice from around the world with the specific characteristics of Tanzania. On the other hand, though, the perception that there is plenty of time may lead to drift and a failure to appreciate the challenges inherent in establishing (and testing) a robust and coherent institutional framework for managing the eventual increase in resources. *Government needs to foster a sense of urgency in its planning for eventual resource inflows. This should be clearly projected through the Natural Gas Policy and the Utilization Masterplan.*
- 3. Expectations need to be carefully managed during the transition with clear communication the key.** It will be hard to resist the tendency for people to believe not only that natural gas discoveries will transform economy but that this promise justifies increased expenditure today (i.e. to “mortgage the future”). During the gestation phase -- which may well be characterized by large-scale but highly localized investment activity associated with exploration and development -- speculation about the scale of the windfall will spread like wildfire and is likely to be prone to rumour that government is failing to secure a ‘fair deal’ from contracts with foreign investors and partners. There is an inevitable and irreducible degree of uncertainty in this sector, particularly as projections are updated, global market conditions change and contract arrangements remain fluid, but *this only reinforces the need for government to develop as transparent and plausible a narrative of developments in the sector as possible in order to anchor expectations. This narrative needs to offer to citizens an*

understanding of what can -- and cannot -- reasonably be expected from resource wealth. This transparency helps stem corruption and allows citizens to hold the government to account for failures and contribute to policy debate. But at the same time, well grounded expectations provide government with an instrument to resist popular pressure to undertake excessive (and premature) current spending.

The case for a clear narrative can be seen today where there is already dissonance between popular perceptions and the current best estimates of the scale of resource discoveries. On the basis of current knowledge, the revenue flow to government from the export of LNG might be around \$2.5bn - \$3bn per annum starting from around 2020 for the duration of the resource flow. If realized, this would amount to US\$ 40 to \$50 per capita per annum, depending on estimated population size, something similar to the level of aid inflows today. This is a large amount and, if managed well, can substantially boost growth. But of itself it is not transformative: the rents from natural gas *will not* transform Tanzania into a Qatar (or even a Mozambique). Government needs to clearly broadcast this 'important but not transformative' message.

- 4. A coherent strategy for natural gas requires careful consideration of the alternative uses to which natural gas can be applied.** There are three choices: gas can be liquefied for export to world markets; it can be used to substitute for liquid fuels in power generation and (if compressed) as a substitute for gasoline for urban transport; or it can be used as feedstock.

Given the enormous capital costs involved, investors (i.e. foreign gas companies) will need to be certain that there is sufficient guaranteed throughput to justify the construction of the infrastructure to produce LNG for export ('LNG trains'). If and only if this is secured will any of the offshore gas reserve be developed, from which the 'excess over exports' may then be allocated to alternative uses.

- 5. Assuming this threshold is met – and we expect the major investors to commit within the next 3-4 years – the government's share of income from exporting will be determined by two parameters.** The first is the rent per unit of gas exported from Tanzania. This is defined as the difference between the price in the export market less the full cost of exporting (liquefaction, transport and re-gasification) and the full 'on the beach' cost of Tanzania gas (the 'on the beach' cost consists of the full cost of extracting gas, including financing and costs borne by the operators before the distributable rent is declared). The second parameter is the fraction of this distributable rent secured by government through negotiated royalty, profit share and corporate tax arrangements.

How large the public revenue from exporting will be clearly depends on both parameters. While the latter can be secured through careful design and negotiation of contract terms and the regime for natural resource taxation (processes that are underway), the former is and will remain highly uncertain. Many of the geological and technical challenges faced in extracting gas from the Indian Ocean are yet to be fully understood – so that the underlying

cost structure remains uncertain -- while huge uncertainties as to how the global gas market and gas prices will evolve over the coming decades means that the likely market price Tanzanian gas may command in future decades is almost impossible to predict. *Recognizing these uncertainties, Government needs to pay close attention to the technical and market developments for natural gas and to be prepared to re-calibrate its own gas sector strategy as new information arrives. Per-unit rents could be significantly higher or significantly lower than current estimates suggest and government planning must be flexible enough to respond to such eventualities. In particular, government must be careful not to lock itself into planning assumptions that prove to be wildly over-optimistic.*

- 6. Natural gas production in excess of the minimum required to ensure export viability offers an important route out of the trap of high cost and low reliability of power generation, and opens us the possibility of a new comparative advantage in energy-using sectors.** The economics of substitution towards local natural gas are simple. It makes sense to sell gas to domestic power generators at the *net export price* for gas (i.e. the relevant world price less export costs, as defined above). Assuming this is lower than the current price of oil/diesel used for power generation, substitution from high-cost oil generation to gas-fired generation will boost real incomes in a manner directly equivalent to a terms-of-trade improvement. This comes in two parts: first is an *income effect* arising from the fact that current levels of power generation will be cheaper, and second is a *substitution effect* arising from the increase in energy demand coming from the growth of energy-intensive activities which are now profitable at the lower cost of power. These gains will be reduced by the cost of switching and adding new generation capacity to take advantage of lower gas costs. *It probably does not make sense to sell gas for domestic power generation - below the net export prices. To do so would be to offer a subsidy which raises concerns about inefficient resource allocation. The case for subsidizing power generation would need to be justified by appeal to clear arguments that there is some externality that warrants a specific input subsidy. Whilst not ruling out such a possibility, government's starting point should be to set domestic gas prices at their opportunity cost on world markets.*
- 7. The availability of a local source of natural gas may allow the economy to exploit new sources of comparative advantage in terms of domestic production,** either for export to regional or world markets or as a substitute for existing imports as Tanzania goes from being a high- to a low-energy-cost economy. Given its location, competitive labour and cheap energy could give Tanzania a comparative advantage in a range of goods. *Whether this potential can be realized is likely to depend as much on the quality of infrastructure and other complementary public inputs (financed by gas revenues) as on lower energy costs. However, if supported by well-designed infrastructure investments, the prospects for diversification and growth are encouraging.*
- 8. It does not necessarily follow that gas should be used as feedstock for the development of downstream activities.** As in the previous paragraph, whether Tanzania becomes globally (or regionally) competitive in these sectors will depend not just on the availability of gas but on a range of other factors determining comparative advantage. Moreover, it should be noted that the opportunity cost of gas in Tanzania is likely to be higher than for producers

elsewhere (such as Qatar): given the sharp fall in global transportation costs over the last 30 years or so, it may well be the case that it is still more efficient to import gas-intensive goods such as fertilizer produced elsewhere at a lower cost than to invest in domestic capacity. *This is, of course an open question, but public investment in downstream investment must be assessed on a case-by-case basis and government must avoid the temptation of assuming that because Tanzania produces gas it should necessarily produce gas-intensive goods.*

- 9. Opportunities for local participation in the sector can be enhanced by promoting the engagement of mid-size local firms in international supply chains in the natural gas sector.** Left to its own devices, the natural gas sector does not generate strong backward linkages to the domestic economy, either in terms of employment or the demand for intermediate inputs. While mandated local content rules may generate demand for local goods and employment in the short run, a growing domestic participation will be strengthened if domestic firms become increasingly engaged in the sector's global supply chains so that they, as well as foreign firms, generate the demand for skilled local labour and other inputs. *The design of a local content policy should focus as much on promoting domestic firm capabilities and productivity (recognizing that these will emerge at the top end of the firm sector) as placing simple local content requirements on foreign firms.*
- 10. Finally, experience from around the world suggests that economies that manage natural resource discoveries well do so by leveraging resource rents to grow the non-resource economy.** It is the non-resource economy that will generate the employment and distribute the gains from natural gas widely through the population. When such strategies are successful the returns dwarf the direct value of resource rents alone. *It follows that government policy should be built on three pillars. The first is the focus on developing a growth and employment strategy in the non-resource economy. The second is the need to ensure that systems of public resource management can efficiently leverage gas rents into key infrastructure and complementary inputs (both physical and human) that can support private investment. And the third is a strategy for macroeconomic management capable of smoothing public expenditures in the face of potentially volatile resource revenues so as to insulate the non-resource economy from the potentially damaging 'Dutch disease' effects that often accompany a resource inflow.*