

**PRELIMINARY REPORT ON FISCAL DESIGNS
FOR THE DEVELOPMENT OF ALASKA NATURAL GAS**

BY
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For

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Section 1.2

Glossary of Terms Used, Abbreviations and Terms Avoided

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Terms Used in the Report

Associated Gas. Natural gas found in association with oil, either dissolved in the oil or found as a cap of free gas above the oil in the reservoir. Associated liquids refer to liquid hydrocarbons in association with natural gas.

Barrels of Oil Equivalent (boe). Unit conversion to express various forms of hydrocarbons in the standard terms of a barrel.

Calorific Value. A measure of the amount of energy released as heat when a fuel is burned.

Depreciation. The reduction in the value of plant or equipment over time due to wear, tear and obsolescence generally at rates specified by accounting or taxation rules of the jurisdiction in which the assets are operated.

Destination Value (DV). A sales value expressed per unit (per barrel or per mcf or per mmbtu) at the final destination (end of the pipe or refinery dock). DV is the same as revenue when it is expressed as total dollars from sales equal to the market price (DV) times the volume sold of the commodity (whether actually sold or transferred to an owed refinery or other facility).

Fiscal Certainty. A status referring to a high level of legally enforceable confidence from taxpayers, underpinned by a law or a contract, where the fiscal terms are not going to be changed over a specified planning horizon. Such confidence is usually only provided to a taxpayer in the form of a contractual agreement, fiscal statute or constitutional amendment specifying that total government fiscal take from a specified project will not change over a specified period and if subsequent government actions cause it to change during that specified period adjustments will be made to restore the agreed fiscal status quo.

Fiscal Credibility. This is a perception rather than a status has more to do with the consensus view of taxpayers and public opinion concerning the fiscal policies being adopted by the government (or other authority with tax-raising powers). Are those fiscal policies considered to be consistent and the fiscal burden placed on major industries predictable in terms of a stated fiscal strategy with clear objectives concerning sovereign take, incentives for industrial growth, resource development and expanded employment opportunities and improved local skills? Are such strategies being pursued over the long term or are they being changed frequently and with little discussion and consultation with major taxpayers by new political leaders with short-term objectives without apparent regard for long-term consistency? If the perceptions are that fiscal policies are inconsistent, unpredictable and without clear long-term objectives it is safe to conclude that the taxing authority lacks credibility among its major taxpayers.

Fiscal Stability. This is a perception backed up by historical performance and requires the taxing authority to have a track record of prudent fiscal policy, not necessarily one that has not been changed for many years, but one where the changes have been prudently considered with wide discussion involving all stakeholders and with clear long-term development objectives sought in the best interest of all taxpayers and without rendering some industry assets sub-commercial. Fiscal stability requires fiscal credibility, but not fiscal certainty. It is possible to achieve fiscal stability with actions that achieve alignment the major taxpayers and the taxing authority through a combination of fiscal incentives and progressive taxes that lead to an equitable and sustainable share of economic rent in both highly profitable and marginal projects. Regressive taxes that lead to projects with sizeable reserves becoming marginal from a taxpayer / investors perspective, i.e. providing high fiscal revenues to the government but no positive return to the taxpayer even at quite high unit product values, are unsustainable in terms of promoting resource development over the long term and are not conducive to growing fiscal revenues.

Gas or Natural Gas. A mixture of hydrocarbon gases predominantly methane (C1) with additional fractions of ethane (C2), propane (C3) and butane (C4) (that is up to and including C4 including some impurities and only residual traces of C5+).

Gas Cycling. A process in which produced gas is re-injected into a reservoir after condensate and other gas liquids are stripped from it to maintain reservoir pressure above the dew point or to preserve the gas until a market for it becomes available. It is essential to maximise gas liquids recovery from certain reservoirs.

Gas Grid or Gas Distribution Network. The grid or network of pipelines used to distribute gas around a region for delivery to end users of the gas.

Gas Processing versus Gas Treatment. Although the precise definitions can be found in AS 43.55.900 (9) – (11), generally processing is getting gas ready to be produced typically by separating it from other hydrocarbons (and water) and is upstream of the point of production. Gas treatment is downstream of the point of production and consists of getting gas ready for transportation on a gas line and meeting the specs required for that pipeline. In Alaska this is expected to mean removing carbon dioxide and hydrogen sulphide. Some NGLs may be removed as either part of gas processing or gas treatment operations.

Gas-to-Oil Ratio (GOR). The volume of gas at atmospheric pressure produced per unit volume of oil produced. Each oil and gas reservoir tends to have its own unique GOR which determines how much associated gas is produced from a specific oil field.

Government Take. In Alaska this means local, state and federal take, which is in line with the international usage of this term referring to the sum of government take at all levels.

Henry Hub. A pipeline interchange near Erath, Louisiana, where a number of interstate gas pipelines meet. It is the delivery point for New York Mercantile Exchange (NYMEX) natural gas futures contracts in the U.S. and the benchmark natural gas price for gas trading in the U.S. Gulf Coast.

International Energy Agency (IEA). Organisation established in 1974 to monitor the world energy situation, promote good relations between producer and consumer countries and develop strategies for energy supplies during times of emergency. The IEA is an autonomous body within the Organization of Economic Cooperation and Development, OECD.

International Oil Company (IOC). Oil and gas companies producing in more than one country, typically the kinds of bidders seen as major investors in Alaska's oil and gas industry and in the oil and gas industries around the world.

Liquefied Natural Gas (LNG). Gas, mainly methane, liquefied at very low (cryogenic) temperatures close to minus 256 degrees Fahrenheit at close to atmospheric pressure conditions.

Liquefied Petroleum Gas (LPG). Propane and butane liquefied under pressure or refrigeration (moderate cryogenic temperatures as low as about minus 40 degrees Fahrenheit). LPG is sometimes referred to as bottled gas.

Mineral-Interest Fiscal System. One in which the permit, concession, license or lease holders are granted title to production and reserves and in which the fiscal take consists mainly of bid bonuses, royalties and taxes on production and income from the sale of oil and gas produced. Such systems have evolved in OECD countries and are favoured by them, but also exist in other countries.

Net Revenue. This refers to the total money to a producing company after subtracting all costs (including royalties and property taxes) but prior to income and production taxes (which are similar to income taxes in that costs are accounted for). It would be distinguished from the production tax value (PTV) because the PTV only allows for the deduction of allowable lease expenditures, while net revenues allows for the subtraction of all actual costs whether they are allowable lease expenditures or not.

Natural Gas Liquids (NGLs). These are light hydrocarbons which can be extracted as liquids during the manufacture, purification and stabilisation of natural gas in processing plants or from gas field facilities. NGL compositions range from propane (C3) to condensates (C5+). The lighter NGLs commonly exist in gaseous form in a subsurface reservoir, whereas the heavier NGLs may be in either gas or liquid in a subsurface reservoir.

National Oil Company (NOC). In an international context government-owned oil companies, although the percentage of ownership by the state and private investors may vary greatly

between NOCs. Typically focused on the development of the resources within the owner country. This is not a hard and fast rule, and many NOCs are now seeking opportunities internationally. Currently some NOCs operate in Alaska, such as ENI and StatoilHydro, which are partially owned by their national governments (i.e., Italy and Norway, respectively). The term NOC is also used loosely to cover national gas companies (e.g. Gazprom or Russia).

Net Present Value (NPV). This discounted cash flow value as used in the analysis presented in this report is performed using real dollars based in year “0” dollars – and thus when a project is valued over time, it is the value in real year 0 dollars of the project over time. Cash flows in far-out years are worth less today than cash flows in near-term years, so cash flows are put on a year 0 basis through discounting and deflating (i.e., removing the effects of inflation).

Oil and Pentane Plus (C5+). These include hydrocarbon compounds of C5 and above which commonly occur in the liquid state. However, some C5+ does exist in the gaseous state in subsurface reservoirs and in petroleum produced from them and brought to the surface. Such gaseous C5+ is usually condensed or liquefied in gas processing or treatment plants and commingled with crude oil for transportation and sale. The term Oil (C5+) is used in this report to include both crude oil and condensed C5+ originally produced in a gaseous state.

Point of Production (POP). In this report point of production is the same as found in Alaska at AS 43.55.900 (19). For oil that means delivery into a pipeline in pipeline quality. For gas it is the first point where sufficient processing has occurred that the gas is accurately metered. Except in an integrated plant that includes gas treatment, it is the furthest upstream point where gas processing has been completed or gas treatment has begun.

Point of Production Value (PPV). This is destination value (DV) minus Treatment, Transport and Tariff (TT&T). This is not the same as Destination Value (revenue), since TT&T is deducted to reach PPV. When it is appropriate to express on a per-unit basis it will be seen as for example PPV/bbl or PPV/mcf of PPV/boe.

Production-Sharing Agreement (PSA) or Production-Sharing Contract (PSC). An upstream contract type widely used internationally between governments and oil and gas companies. Title to petroleum remains with the government. The contractor, usually an IOC, meets all exploration and development costs in most PSAs, and earns revenue from a share of production controlled by specified fiscal terms. An IOC may also have to pay royalties and taxes on its share of production, although in some cases the contract specifies that taxes are paid from the government’s share of production.

Production Tax Value (PTV). This tax base value is destination value (DV) minus TT&T and minus allowable upstream costs (or PPV minus allowable upstream costs). Again, when it is appropriate to express on a per-unit basis, it will be seen as for example PPV/bbl or PPV/mcf of PPV/boe – the latter of course being the trigger for progressivity under Alaska’s current oil and gas production tax law.

Progressivity and Production Taxes. These taxes have been applied in Alaska since the fiscal reforms of 2006 / 2007. In this report we use the abbreviations BPT (base production tax), CPT (combined production tax), GPT (gas progressivity tax) and OPT (oil progressivity tax) to distinguish different ways of potentially calculating an additional progressivity component to Alaska's production tax

Production taxes under AS 43.55 will be broken into

- The base production tax (BPT), defined as 25% of PTV at AS 43.55.011(e).
- A combined oil and gas progressivity tax (CPT), defined as between 0% and 50% of PTV, as set out at AS 43.55.011(g).

This report recommends separating the progressivity tax into two distinct components – one each for oil and for gas, which are designated OPT and GPT respectively for the recommended oil and gas progressivity tax.

Proven Reserves. The quantity of crude oil and natural gas demonstrated with reasonable certainty to be recoverable from known reservoirs under existing economic and operating conditions. These are the highest-confidence reserves category and established according to Society of Petroleum Engineers' guidelines. Lower-confidence categories of reserves (e.g. probable and possible) and contingent resources also contribute to the overall mineral resource base.

Recoverable Reserves. The proportion of oil and gas that can be recovered to the surface from a subsurface reservoir using existing techniques that can be applied using the facilities and equipment installed at the surface production site.

Regasification Plant (LNG Receiving Terminal). A facility that receives LNG and processes it back into natural gas for injection into a gas transmission / distribution pipeline network.

Royalty. Payment to the state of a percentage of (gross) point of production revenue from the production of minerals, including hydrocarbons, by the company licensed to produce. Or, transfer of actual ownership of the commodity to the state of the same percentage of production.

Spot Contract. A sale and purchase agreement for a commodity describing a one-time open-market transaction where a commodity is purchased "on the spot" at current market rates. Spot transactions are made in the short term in contrast to term deals, which specify a steady supply of product over a period of time.

Take-or-Pay. A clause in a contract that dictates a minimum quantity of a commodity to be paid for in a specified period whether or not buyer is able to or wants to take delivery of it from the supplier. Common in gas sales and LNG contracts, where take-or-pay contracts are required to obtain project financing.

Treatment, Transport and Tariff (TT&T). These are downstream costs in Alaska (including oil and gas treatment, pipeline tariffs and tanker charges) and modelled as such in this report being fully expensed from DV to derive PPV.

Upstream Costs. In an Alaska context these are costs of exploring for, developing and producing oil and gas that are upstream of the point of production.

List of Abbreviations

bbbl	Barrel(s) of oil
b/d	Barrel(s) per day
C5+	Pentane plus
cf	Cubic feet of gas
DMO	Domestic market obligation
DV	Destination value
EIA	Energy Information Administration (U.S. government agency)
IOC	International oil company
GOR	Gas-to-oil ratio
IRR	Internal rate of return
LNG	Liquefied natural gas
LPG	Liquid petroleum gas
NGL	Natural gas liquid
NOC	National oil company
NPV	Net present value
OECD	Organization of Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
PPV	Point of production value
PSA	Production-sharing agreement (PSC - Production-sharing contract)
PTV	Production tax value
ROR	Rate of return
tcf	Trillion cubic feet
TT&T	Treatment, transport and tariff

Terms Avoided in the Report

Terms avoided or carefully qualified when used in this report to avoid ambiguities that might occur when used in an Alaska context are:

- Price, unless it is specifically in the context of a market price recitation, such as “Henry Hub price” or “NYMEX price”. In any other use, readers will be confused as to the pricing point and whose price we’re talking about
- Gross, since one man’s gross is another man’s net, especially in Alaska (How many costs get deducted before a value can no longer be called gross and becomes net?).
- Export, because to many Alaskans it means an LNG export gas project. But it’s OK to use export as a verb, as in, “exporting North Slope gas to Lower 48 markets.” But calling the pipeline an export project, or referring to exporting gas from Alaska without a qualifier of where/how it is going, would conjure up inaccurate images of a specific export project.
- Field costs, unless referring specifically to the field costs agreed upon in the 1980 Prudhoe Bay settlement agreement or the various 1990s royalty settlement agreements, all resolving issues in the so-called Amerada Hess royalty litigation. .
- Wellhead value, since we will use PPV and PTV as more specific definitions than the unspecific “wellhead.”
- Downstream and Midstream Costs, because in Alaska it appears that any cost downstream of the point of production – such as TAPS and tankers – are considered “downstream” costs, while in the world at large transportation elements such as pipelines and marine transportation necessary to get hydrocarbons to market could be considered “midstream” and refining and marketing would be considered “downstream.”
- Liquids because of the confusion over NGLs potentially occurring in gas and liquid forms. Oil (C5+) is used to cover crude oil plus condensed NGLs.