Scottish Independence and the North Sea Oil and Gas Sector
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1. Scottish independence would have significant consequences for the North Sea oil and gas industry, and the wider Scottish economy, including the balance of payments and budgetary position of a Scottish Government. This memorandum discusses key issues affecting the oil sector.

2. Scottish independence would require the establishment of boundaries to demarcate the Scottish Continental Shelf. Historically, boundaries in the North Sea were established through negotiations with the median line being employed as the main guiding principle. The UK Government favoured this approach in the discussions leading up to the UN Convention on the Continental Shelf in 1958. But negotiations can involve other considerations, and, if no agreement is reached, the issue can be referred to the International Court. This body may not adhere to the median line principle as happened when it determined the boundary lines between West Germany and Denmark/Netherlands in 1969. Currently the median line principle is employed to demarcate the North Sea between Scotland and rest of the UK for fisheries management purposes. This constitutes a precedent for the adoption of this principle. The consequences of its use are shown in Chart 1.
Chart 1
Scottish Maritime Boundaries
3. The UK Government has boundary agreements with Norway, Denmark/Faroe Islands, and Ireland. These would require ratification on Scottish independence. Conformity with the UN Convention on the Continental Shelf would also require application from the Scottish Government though conformity is likely under customary international law.

4. Over the years Professor Kemp and Linda Stephen of the University of Aberdeen have estimated the hypothetical shares of the various activities in the UKCS which would have accrued to Scotland had it been independent. The median line principle has been employed for this purpose. These calculations have recently been updated. The results are shown in Charts 2 – 9 for the period 2000-2012. It is seen that the hypothetical Scottish share of oil production has generally exceeded 90%. The Scottish share of gas production has generally exceeded 50%. In 2012 it fell to 47%, reflecting a substantial increase in downtime on fields in the Scottish sector. The Scottish share of total hydrocarbon production (including NGLs) has generally been in the 70%-80% range. It fell to 76% in 2012 as a consequence of increased gas field shutdowns. The Scottish share of development expenditures (Chart 5) has generally been in the 80%-90% range. In recent years it has increased due to the very large investments in new fields in the Scottish sector. Accompanying this has been substantial cost inflation. The Scottish share of operating expenditures (Chart 6) indicates that this has been just over 80% in recent years. The Scottish share of total field expenditures (including decommissioning) is shown in Chart 7. The increase to nearly 85% in recent years reflects the very large investment in the Scottish sector. The hypothetical Scottish share of gross production revenues is shown in Chart 8. Generally they have been in the 80%-90% range since 2000. The fall to 85% in 2012 reflects the downtime in gas fields in the Scottish sector. The very high share of gross revenues reflects the preponderance of oil in the Scottish sector. The hypothetical Scottish share of tax revenues is shown in Chart 9. It has often been in the 80%-90% range since 2000. This reflects in particular the effects of the preponderance of the much more highly
priced oil compared to gas emanating from the Scottish sector. Over the last couple of years the Scottish share has fallen due to the particularly high investment and thus related tax allowances in the Scottish sector, plus the decline in the share of gas production. Estimation of the share of tax revenues applicable to the Scottish sector involved substantial modelling and related assumptions. Thus the Scottish and rest of UK sectors had to be separated for tax purposes, so that allowances for all types of expenditures could be offset only against income from the sector in which they took place. The economic modelling was conducted with the use of a high-quality field database. The separation of fields between the Scottish and rest of UK sectors was relatively straightforward. But there are several categories of non-field specific costs which are tax deductible. These were allocated between the two sectors. The total exploration and appraisal costs for the UKCS were allocated to the two sectors on the basis of (1) the respective numbers of wells and (2) the estimation that the average well costs were twice as high in the Scottish sector as in the rest of the UK. Loan interest and R and D costs were allocated on the basis of the percentage of total field development costs in the Scottish sector compared to the rest of the UK. Deductible overhead costs were allocated on the basis of total operating costs in the Scottish sector compared to the rest of the UK. The economic model contains all the PRT, CT and SC tax arrangements including the relevant field allowances for SC.
Chart 2
Scottish Share of Oil Production

Chart 3
Scottish Share of Gas Production

Chart 4
Scottish Share of Total Hydrocarbon Production
5. Scottish independence would involve significant transitional issues. On the taxation aspects it was noted above that separate accounts would be required for the Scottish and rest of UK, distinguishing between revenues and expenditures/allowances emanating from each. Effective taxation would require investors to designate establishments with central management and control based in Scotland. Currently a branch of a foreign company undertaking exploration /production in the UKCS is deemed to have a permanent establishment, with the taxable profit being computed separately from the non-resident company. A Scottish Government would have to make provision for this. There could be a perceived need for a tax treaty between Scotland and the rest of the UK
and indeed with other countries from which investors in oil and gas emanate. Some gas fields which would be in Scottish waters export the gas by pipeline to terminals in England. There would be a need to clarify the jurisdiction and tax status of these pipelines. The UK Government already has experience of such international agreements. A specific tax issue relates to decommissioning relief. For PRT the rules are that decommissioning losses in a field are clawed back indefinitely against earlier PRT field profits and tax refunds made. For CT and SC the claw back is permitted to 2002. A complex situation arises when decommissioning takes place after Scottish independence but the claw back extends to the pre-independence date. Although there are no known discoveries which straddle the median line between Scotland and the rest of the UK it is possible that this could arise in the future. In that case the need for unitisation across jurisdictions would arise and separate taxation levied to reflect the unitisation agreement. Again the UK Government has substantial experience in negotiating unitisation agreements across jurisdictions. The UK government is currently making provisions for guaranteed tax relief for decommissioning costs through long term contractual arrangements with licensees (decommissioning relief deeds). This issue is of major importance and any uncertainty over this would need to be addressed by an independent Scottish government.

6. The current tax system applicable to the UKCS is very complex and much specialist knowledge and large amounts of data are required to operate and maintain the scheme. The taxable position of a company depends on the accumulated allowances which are likely to be voluminous and complex. A Scottish Government would have to acquire such knowledge and data. As an interim measure the work involved could be contracted to the specialist part of HMRC which is currently responsible for policy implementation and maintenance. The concept of shared competence is well-established in other areas.

7. Similar issues arise with licensing and related regulations. These include the following:
(a) Arrangements for awarding licences
(b) Drilling and field development approvals
(c) The fallow initiative
(d) The stewardship initiative (including production efficiency)
(e) The government’s role in third party access to infrastructure, including the ICOP
(f) The regulations relating to decommissioning

The implementation of the Wood Review proposals emphasise collaboration among licensees and the onus on the new regulator to promote such collaboration. The Scottish Government has already stated that it would honour existing licences and the contracts guaranteeing tax reliefs for decommissioning. There would be significant transitional problems relating to the transfer of responsibilities for the issues listed above. Effective licensing and regulation require substantial specialised skills and a large amount of data and other information relating to performance of licensees against their work programmes and development plans, the interpretation and use of seismic and well data, and the assessment of new field development and IOR/EOR plans. The new regulator will be responsible for much of all of these. As a practical interim measure there would be merit in contracting the new UK regulator to undertake these tasks.

8. Similar issues apply to HSE matters. There would again be merit in contracting the responsibilities to the current HSE, at least as an interim measure.

9. The independent Scottish Government would, of course, be responsible for policy formulation within its own jurisdiction for taxation, licensing and regulations.

10. Much media attention has been given to the question of investment risks following Scottish independence. Generically political risk is the term applied to reflect the uncertainties regarding any legislative matters which could impact on the industry. The Scottish Government
has already given some assurances, including no intention to increase taxation, the honouring of existing licences, and guarantees of tax relief for decommissioning. Other policy areas remain to be clarified. An Independent Expert Oil and Gas Commission will soon produce further policy recommendations. In the meantime it can be said that some uncertainties remain and there will be some compliance costs. But these political risks are relatively small compared to those faced by the oil industry in other countries. As examples it can be said that the political risks facing the industry in Russia, Iraq, Egypt, Libya, Venezuela, Iran and Algeria are much greater than in Scotland. In the UK it is also arguable that the political risks since, say, 2000 have been substantial given the significant and unforeseen tax increases in 2002, 2006 and 2011.

11. Professor Kemp and Linda Stephen have produced a new research paper which models the prospective future activity in the UKCS to 2050. A large financial simulation model is employed to project activity levels with assumptions based on recent trends in exploration effort, discoveries, new field developments and new incremental investments. Probable and possible new field developments and currently-examined incremental projects are based on information validated by operators. This also applies to existing sanctioned fields. The financial model incorporates all the elements of the complex tax system. For investment screening purposes an oil price of $90 per barrel in real terms and a gas price of 58 pence per therm in real terms have been employed. (These are not intended to reflect market values). Two assumptions are made about the current production efficiency problem. In the first case it is assumed, that, following the implementation of the Wood Review proposals, the production efficiency problem is largely resolved by 2019. In the second case it is assumed that the problem is only partially resolved by 2019.

12. Some key results for the case where the production efficiency problem is largely resolved by 2019 are shown in Charts 10-21. Over the period 2014-2050 inclusive, for the whole of the UKCS 15 bn boe is produced.
The share of this from the CNS/MF, NNS, and W of S regions combined is 84.6%. The great majority of this would be attributed to the Scottish sector if the median line were employed for demarcation purposes. The above figures relate to total hydrocarbon production. The share of oil production attributable to the Scottish sector is substantially higher. The share of total development expenditure attributable to the CNS/MF, NNS, and W of S regions is just over 90%, the share of operating costs is 90% and share of decommissioning costs 86.5%.

Chart 10

Potential Oil Production
$90/bbl and 58p/therm

Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved

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Chart 11

Potential Gas Production

$90/bbl and 58p/therm

Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3

Production efficiency problem resolved

Sanctioned Incremental Future Incremental Probable Possible Technical Reserves New Exploration

Chart 12

Potential Total Hydrocarbon Production

$90/bbl and 58p/therm

Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3

Production efficiency problem resolved

Sanctioned Incremental Future Incremental Probable Possible Technical Reserves New Exploration
Chart 13
Potential Development Expenditure
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved

Chart 14
Potential Operating Expenditure
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved
Chart 15

Potential Cumulative Decommissioning Expenditure
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved

Sanctioned
Incremental
Future Incremental
Probable
Possible
Technical Reserves
New Exploration

Chart 16

Potential Oil Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved

Cns / MF
Irish
Nns
SNS
WoS
Chart 17

Potential Gas Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved

Chart 18

Potential Total Hydrocarbon Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved
Chart 19
Potential Development Expenditure
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved

Chart 20
Potential Operating Expenditure
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem resolved
13. In the case where the production efficiency problem is only partly resolved the related total cumulative production from the UKCS to 2050 is 14.1 bn boe. Key results are shown in Charts 22 and 23. The shares attributable to the CNS/MF, NNS, and W of S are very similar to those for the more optimistic case described above.
Chart 22
Potential Total Hydrocarbon Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem partly resolved

Sanctioned  Incremental  Future Incremental  Probable  Possible  Technical Reserves  New Exploration

Chart 23
Potential Total Hydrocarbon Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.3
Production efficiency problem partly resolved

Cns / MF  Irish  Nns  SNS  WoS
14. If tougher investment hurdles were applied new investment and thus production would be less. Thus if the hurdle were raised from NPV@10%/I@10% > 0.3 to NPV@10%/I@10% > 0.5 the total cumulative production becomes 12.6 bn boe with the optimistic assumption regarding resolution of the production efficiency problem. Key results are shown in Charts 24-25. A total of 11.6 bn boe is produced if the production efficiency problem is only partially resolved. Key results are shown in Charts 26 and 27.

Chart 24

Potential Total Hydrocarbon Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.5
Production efficiency problem resolved

![Graph showing potential total hydrocarbon production with different categories and years from 2014 to 2050, with various production levels and color-coded layers for Sanctioned, Incremental, Future Incremental, Probable, Possible, Technical Reserves, and New Exploration.]
Chart 25

Potential Total Hydrocarbon Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.5
Production efficiency problem resolved

Chart 26

Potential Total Hydrocarbon Production
$90/bbl and 58p/therm
Hurdle: Real NPV @ 10% / Real Devex @ 10% > 0.5
Production efficiency problem partly resolved
15. In conclusion it can be said that the long run potential is greater than that indicated from the modelling results described above. But this would require a substantial increase in exploration, resolution of the production efficiency problem, more efficient third party access to infrastructure, a substantial number of cluster developments, greater application of more new R and D schemes, and much more enhanced oil recovery. These issues were all identified in the Wood Review. Successful implementation is clearly not easy, but could add substantially to the wealth generated.

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