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DEMOCRATIC REPUBLIC OF TIMOR-LESTE

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REPORT ON MEASURING NATURAL RESOURCE WEALTH IN NATIONAL ACCOUNTS TECHNICAL ASSISTANCE MISSION (DECEMBER 10–14, 2018)

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CONTENTS

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Glossary

ABS	Australian Bureau of Statistics
AUD	Australian dollar
ANPM	Autoridade Nacional do Petróleo e Minerais
BCTL	Banco Central do Timor-Leste
BPM6	*Balance of Payments and International Investment Position Manual, Sixth Edition*
BU	Bayu-Undan oil field
BUCLCP	Bayu-Undan Consolidated Local Content Plan
COE	Compensation of employees
EITI	Extractive Industry Transparency Initiative
FDI	Foreign direct investment
FTP	First tranche production
GDS	Timor-Leste General Directorate of Statistics
GDP	Gross domestic product
GDP(E)	Gross domestic product by expenditure
GDP(I)	Gross domestic product by income
GDP(P)	Gross domestic product by production
GNI	Gross national income
GVA	Gross value added
IC	Intermediate consumption
JPDA	Joint Petroleum Development Area
MNRW	Measuring Natural Resource Wealth
MOF	Ministry of Finance
NOS	Net operating surplus
PPI	Producer price index
PSC	Production-sharing contract
2008 SNA	*System of National Accounts, 2008*
SUT	Supply and use table
STARE	Real Sector Division, IMF Statistics Department
TA	Technical assistance
TST	*Timor Sea Treaty between the Government of East Timor and the Government of Australia*
USD	US dollar

SUMMARY OF MISSION OUTCOMES AND PRIORITY RECOMMENDATIONS

1. **A national accounts technical assistance (TA) mission was conducted at the Timor-Leste General Directorate of Statistics (GDS) by the Real Sector Division of the IMF's Statistics Department (STARE) during December 10–14, 2018.** The mission was staffed by Mr. Timmi Rølle Graversen (IMF short-term expert) and Mr. Richard Wild (Senior Economist, STARE).

2. **The mission was part of a multi-year project to improve measures of natural resource wealth (henceforth simply MNRW) relating to mineral extraction and related activities in national accounts.** The MNRW is the IMF's primary vehicle to provide policy advice and capacity development to 50 low- and lower-middle income member countries in the areas of fiscal affairs, revenue administration, macro-fiscal management, exchange rate policy, and national accounts and government finance statistics. MNRW activities are financed through the MNRW Topical Trust Fund, which is generously supported by donors.[1]

3. **MNRW work on national accounts statistics is based on the IMF's *Guide to Measuring Natural Resource Wealth in National Accounts* (the *Guide*).** The *Guide* was developed during an earlier phase of the MNRW project and provides detailed assistance to compilers on how to measure flows and stocks in the mineral resources industry feeding into measures of production, income and wealth, consistent with the *System of National Accounts, 2008 (2008 SNA)*. The *Guide* provides eight template tables for countries to populate based on the guidance, and then to use directly to improve their national accounts estimates.

4. **As Timor-Leste is one of the most resource-dependent countries in the world, it is essential to ensure measures of mineral extraction and related activities in national accounts are as accurate and consistent as possible**. National accounts provide estimates of GDP and gross national income (GNI), as well as gross national disposable income, gross national saving and, ultimately, national wealth. These statistics provide indispensable inputs to policymakers, investors and international observers. The mineral extraction industry has accounted for up to 80 percent of Timorese GNI in many recent years, meaning that any data and/or methods deficiencies may have a substantive impact on economic levels and growth; and in turn on key medium- and long-term decisions by government and the market sector.

5. **The framework of the *System of National Accounts* is designed to help policymakers and analysts to identify separately income generated from production and other sources of income, including rent (or 'royalties') earned from non-produced assets**. Domestic production involves the organization of labor as well as goods and services inputs, and therefore impacts directly on the real sector through employment, other domestic production,

[1] Comprising Australia, the European Union, the Netherlands, Norway, Switzerland, and the United Kingdom.

imports and exports. Conversely, property income from the provision of rights for others to use natural resources may be generated by nonresident producers with little or no direct impact on domestic labor, production or trade. The ability to distinguish accurately between production and property income is therefore vital to effective and appropriate policymaking.

6. **The mission focused on two main objectives.** Firstly, to review the extent to which mineral extraction and related production activity in the Joint Petroleum Development Area (JPDA) can be attributed to Timor-Leste and Australia, given conflicting assumptions currently made by the GDS, the Banco Central do Timor Leste (BCTL) and the Australian Bureau of Statistics (ABS); and secondly, to identify improvements to the data sources and methods used by GDS staff to estimate mineral extraction and related activities in national accounts.

7. **Against these needs and based on a review of evidence, in accordance with international guidance, the mission recommends revising the split of JPDA oil and gas extraction between Timor-Leste and Australia from 90 percent (Timor Leste) and 10 percent (Australia) to 0 percent (Timor Leste) and 100 percent (Australia).** Given overlapping claims on ownership of the JPDA, the economic residence of producing units cannot be established using geographical demarcation and nor can it be inferred from arrangements for the distribution of income generated from production. As past and present JPDA production has been organized from Australia with very largely Australian physical and labor inputs to production, in accordance with guidance on joint zones set out in the *Balance of Payments and International Investment Position Manual, Sixth Edition* (*BPM6*), all producing units to date should be classified as 100 percent resident in Australia.

8. **However, the reduction in recorded GDP levels through nonresidence of JPDA production, if all flows are measured correctly, will result in increased net property income from abroad such that GNI estimates will remain unchanged**. The reduction in GDP from what is presently recorded as domestic production will be canceled out by an increase in net primary income recorded as being received from Australia. This correction to the way production and income are recorded in the national accounts is crucial. By properly identifying Timor-Leste's role in the production process, it will allow the compilation of GDP and GNI estimates that are consistent with the balance of payments and that form much more useful indicators for policymaking and surveillance. To note, from the revenue perspective, these changes will have no impact on the amount of income Timor-Leste has received from JPDA production.

9. **Notwithstanding the revised determination of residence, the mission also recommends updating various aspects of the current methods used to calculate the oil and gas sector.** It remains important for GDS staff to measure JPDA activity accurately so that data users can continue to make historical comparisons; and also to ensure that compilers are ready to measure activity from producing units that may become resident through a new treaty.

10. **The GDS should take an active, lead role to ensure the implementation of the new determination of residence is pre-publicized, well-understood and applied consistently by related data producers and users.** The GDS is strongly urged to start a process of regular

engagement with staff at the Timor-Leste Ministry of Finance (MOF), the Ministry of Petroleum and Natural Resources (MPNR),[2] the *Autoridade do Petroleos e Minerais* (ANPM), the *Banco Central do Timor-Leste* (BCTL), the ABS and other data users, including international donors and the media, to communicate the rationale, scope and timing of these changes. Such work should include information papers, seminars, technical groups and bilateral meetings designed to meet the technical understanding of different audiences but in all cases making it clear that the changes have no effect on Timor-Leste's national income.

11. In support of this domestic work, staff should work closely with the ABS with the objective of defining consistent counterpart assumptions to be put in place in Australian national accounts and balance of payments estimates. This process has already been discussed in principle with the ABS national accounts advisor assigned to assist the GDS and would greatly benefit from his intermediation. However, while ABS alignment is desirable, it is not essential and should not hold up work to revise Timor-Leste's statistics.

12. To support progress in the above work areas, the mission recommends a detailed one-year action plan with the following priority recommendations carrying particular weight to make headway in improving national accounts quality and consistency with other economic statistics, with particular regard to the extractive industries:

Table 1. Priority Recommendations

Target Date	Priority Recommendation	Responsible Institutions
April 2019	*Formally write to the ANPM to request access, in electronic format, to existing public information on JPDA activities and any further data relevant to national accounts compilation*	**GDS**
April 2019	*Commence consultations with key users on the revised JPDA residence determination and use dialogue to help define the implementation and numerical presentation strategies*	**GDS, ABS, BCTL**
June 2019	*Develop GDP estimates for the oil and gas industry using appropriate volume estimation methods for intermediate consumption and net taxes on products; and utilizing any additional production data from related agencies*	**GDS**
December 2019	*Publish updated national accounts estimates by revising the share of mineral extraction, exploration and support services producing units within the JPDA between Timor-Leste and Australia respectively from 90/10 to 0/100*	**GDS, ABS[1], BCTL**

Further details on the priority recommendations and the related actions/milestones can be found in the action plan under *Detailed Technical Assessment and Recommendations*.

[2] Currently operating under transitional arrangements, headed by the Minister of State of the Presidency of the Council of Ministers.

DETAILED TECHNICAL ASSESSMENT AND RECOMMENDATIONS

Priority	Action/Milestone	Target Completion Date
Outcome: Data are compiled and disseminated using appropriate statistical techniques, including dealing with data sources, and/or assessment and validation of intermediate data and statistical outputs		
H	The GDS should remove JPDA production from estimates of domestic production, ideally by zeroing multiplication factors used in the 'Oil' spreadsheet	December 31, 2019
H	The GDS, in consultation with the BCTL, should reclassify any primary and secondary income earned by Timor-Leste from JPDA production (revenue shares, taxes, interest income, compensation of employees resident in Timor Leste) as being received from overseas in order to revise estimates of GNI and GNDI	December 31, 2019
H	The GDS should begin a program of engagement with key domestic data users and suppliers, via meetings and seminars, to determine an effective dual presentation of national accounts statistics based on the existing and revised determination of residence	November 30, 2019
H	The GDS should consult with the ABS to discuss the residence revision and promote a coordinated adoption of the changes in ABS national accounts and external sector statistics	November 30, 2019
M	The GDS should consult closely with the ANPM and MOF to understand the residence implications for existing and future institutional units wholly or partly within the JPDA should the area become part of Timorese national waters	If and when a new treaty comes into force.
M	The GDS should work with the ANPM and MOF to understand and resolve where appropriate discrepancies between each agency's JPDA production and income (including interest income) information	June 30, 2019
M	The GDS should work with the ANPM and other agencies serving the minerals sector to review the scale of non-JPDA activities, including oil activities in Timor-Leste's territorial waters; quarrying; and exploration and evaluation services	June 30, 2019
M	The GDS should work with MOF to review and potentially revise the assumed share of COE in JPDA production costs	September 30, 2019
M	The GDS should work with MOF to understand the timing of prices used to value JPDA production and potentially lag these to reflect national accounts valuation principles	September 30, 2019

Priority	Action/Milestone	Target Completion Date
M	The GDS should develop a new model to deflate oil and gas production (as described in paragraphs 59–60 and Annex 3)	September 30, 2019
M	The GDS should estimate taxes and subsidies on products using the volume changes in the underlying series to which they relate	September 30, 2019
L	The GDS should work with the ANPM, MOF and other agencies involved in the mining sector to obtain any available sub-annual production and income data	February 29, 2020

A. Review of the Economic Residence of JPDA production

Background and Context

13. To date, inconsistent assumptions by Timorese and Australian agencies on where producers in the JPDA are/were resident for statistical purposes have stemmed from disparate reliances on indicators of sovereignty, contractual jurisdiction and income distributions. The objective of this reassessment is to provide a firm, logical and factual basis for establishing a harmonized treatment of the residence of JPDA producers in the national accounts and the balance of payments of Timor-Leste, Australia and the rest of the world.

14. Both the *BPM6* and the *2008 SNA* define the residence of institutional units based on their centers of predominant economic interest.[3] In the simplest case where an enterprise (an institutional unit engaged in production activities) is resident within a defined economic territory under the control of a single government, its center of predominant economic interest is assumed to be that territory.

15. In more complex cases, including those involving multinational enterprises and producers based in disputed or shared territories, the centers of predominant economic interest must be determined through analysis of how production processes are organized and controlled. Of particular significance in this recommendation is the *BPM6*, paragraph 4.10, which describes approaches to measuring activity in ‘joint zones’ (such as the JPDA), and is shown in full below with key sentences shown in bold:

‘…In some cases, areas are under joint administration or sovereignty, that is, an area is under the effective economic control of two or more governments. These areas can be called joint administration or sovereignty zones. Because, typically, they have laws that differ from the primary territories of the individual governments, the zone could be considered an economic territory in its own right. Because the number of enterprises in these zones typically is small, however, it may be preferred to split the enterprises in the zone between the primary territories rather than publish

[3] *2008 SNA*, paragraph. 2.19; *BPM6*, paragraph. 4.113.

separate data for the zone. The method of splitting should be to prorate on the basis of a relevant factor according to the circumstances, such as some operational indicator or equal proportions for each of the primary territories. ***This general guidance needs to be applied appropriately to the economic circumstances faced. For instance, when the enterprises that account for the vast majority, or all, of the economic activity in the zone are effectively operated from the economy of just one of the sovereign authorities, it may be preferred to treat those enterprises as residents of that economy****, showing the other economy as recipient of its share of property income, taxes, and so on, and avoiding most of the complexities of prorating for those enterprises. The statistical compilers of each primary territory involved should consult with each other to adopt consistent methods with no gaps or overlaps. Through metadata and consultations, they may also assist compilers in counterpart economies to ensure consistency of bilateral data.*

16. For practical reasons, none of the determinations of residence made so far by the GDS, the BCTL or the ABS have treated the JPDA as an economic territory in its own right. To do so would require a significant, coordinated effort between Timor-Leste and Australia to jointly measure all economic statistics within the area, then adjust both countries' national accounts and balance of payments statistics accordingly. A further burden would weigh on international observers, who would also need to treat the area effectively as a separate country and/or make their pro-rata assumptions.

17. The various assumptions used by these agencies instead split production activity based on a 'relevant factor' (GDS), an even split (ABS),[4] or assume that all activity has been resident in Australia (BCTL). In the GDS decision, the split of 90 percent of production to Timor-Leste and 10 percent to Australia was based on the revenue shares set out in the *Timor Sea Treaty*[5] (*TST*), which came into force in 2003, while the ABS decision was based on the joint Timorese/Australian jurisdiction of the JPDA set out in the *TST*. The reason for the BCTL decision is less clear but is understood to have been driven in part by measurement practicalities.

18. The revised determination of residence proposed here is consistent with guidance set out in the *BPM6* and the *2008 SNA* and considers specific evidence in two areas:

- The *TST*, which defined the JPDA and the relationship between Timor-Leste and Australia regarding petroleum activities and revenue-sharing in the area.
- The organization of production activities in the JPDA from 2003 to the present.

19. The impact of the revised determination of residence should be applied to the extent of national accounts statistics produced by the GDS, currently 2000 to 2017, rather than from 2003 when the *TST* came into force. Two facts determine the length of the proposed revisions window. Firstly, limited activity occurred in the area (pre-JPDA) from 2000 to 2003, but not at a level considered to be of significance in the determination

[4] See http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/1350.0Feature%20Article34Jan%202004.

[5] Formally, the *Timor Sea Treaty between the Government of East Timor and the Government of Australia.*

of residence, while activity that occurred prior to 2000 is out of the current statistical scope. Secondly, the future ratification of a new treaty between the governments of Timor-Leste and Australia, which would create a permanent, shared maritime boundary locating the entirety of the JPDA within Timorese waters, will require a revised assumption about the residence of JPDA production. This latter issue is discussed further (paragraph 48), but, though it dominates present JPDA discussions, is not relevant in determining historical residence under existing international arrangements.

Rejection of Arrangements Under the Timor Sea Treaty to Determine Economic Residence

20. The *TST* was written to facilitate interim arrangements between Timor-Leste and Australia to jointly administer petroleum extraction activities in the JPDA, but without prejudicing either country's claims of sovereignty over the area. As well as setting out common rules and the establishment of a jointly-administered 'Designated Authority'.[6] it states the following on sovereignty:

'Article 2: Without prejudice

(a) This Treaty gives effect to international law as reflected in the United Nations Convention on the Law of the Sea done at Montego Bay on 10 December 1982 which under Article 83 requires States with opposite or adjacent coasts to make every effort to enter into provisional arrangements of a practical nature pending agreement on the final delimitation of the continental shelf between them in a manner consistent with international law. This Treaty is intended to adhere to such obligation.

(b) Nothing contained in this Treaty and no acts taking place while this Treaty is in force shall be interpreted as prejudicing or affecting Australia's or East Timor's position on or rights relating to a seabed delimitation or their respective seabed entitlements.' [7]

21. It follows that, in the absence of an agreement on the final delimitation of the maritime boundary (a) and with neither country ceding any rights to the other (b), the *TST* itself does not establish either country's sovereign economic territory within the JPDA. This was also the view taken in the ABS's residence note.

22. While the *TST* does set out how 'oil revenue'[8] must be shared between Timor-Leste (90 percent) and Australia (10 percent), this allocation relates to only to the residence of the *recipients* of property income, not the residence of the producing units *generating* the income. In the national accounts, income generated from production by a resident unit may then be allocated as primary income to other resident units and/or nonresident units in the form

[6] Formerly, this was the Timor Sea Designated Authority but is now overseen by the ANPM.

[7] Excerpt from the full document, available at: http://www.austlii.edu.au/au/other/dfat/treaties/2003/13.html.

[8] Without providing a definition.

of compensation of employees (COE) or property income (profits, dividends, interest, natural resource rents).

23. The allocation of property income has no bearing on the residence of producing unit itself. For example, a factory may be sold from a domestic to foreign entity with all profits being sent overseas thereafter, but the factory would remain resident in the domestic economy. The current GDS assumption of a 90:10 split based on the allocation of part of primary income is therefore not based on a factor relevant to production activity.

24. In contrast, the allocation of COE may provide an indication as to how production is organized, as labor is a primary input to the production process. The allocation of COE is not a qualifying criterion for residence; rather, it is one of various pieces of information that help statisticians to form a reasonable narrative on complex production arrangements such as this. In the JPDA, available information indicates the mix of Timorese and Australian staff has been largely in Australia's favor in terms of headcounts, and even more so in terms of Australian employees' share of COE, which suggests that more of the management and decision-making is undertaken in Australia.

25. While the *TST* establishes joint Timorese/Australian jurisdiction of production in the JPDA, it is invalid to assume a 50:50 split of the producing unit on this basis. Although assuming an even split follows the broad initial principles of territorial definition set out in the *BPM6* (paragraphs 4.3-4.6), it ignores the further specific guidance on the treatment of 'joint zones' later set out in paragraph 4.10 to make case-by-case decisions based on the particular economic circumstances. As such, the assumption of a 50:50 split of production misrepresents the connection of the past and present operating entities to each country and reduces the usefulness of macroeconomic statistics for policymaking and analysis, which should be its principal aim.

26. As a general agreement forming the basis of future contractual arrangements in the JPDA, the *TST* does not provide any information on the centers of predominant economic interest of future producers operating in the JPDA. Establishing the center of predominant economic interest for a production unit is the fundamental principle to establish residence set out in the *2008 SNA* and *BPM6*. Accordingly, JPDA producers' residence must be determined by examining the extent to which each field's production is organized—that is, how labor and product inputs are combined to produce outputs—from Timor-Leste, Australia, or some combination thereof.

Recommended Use of Information on the Organization of Production to Determine Economic Residence

27. Since 2004, the Bayu-Undan field has dominated mineral extraction activity in the JPDA, with the Kitan field extracting much lower volumes. Bayu-Undan is a joint investment venture between several companies but is operated by ConocoPhillips Pty (Australia). It has been continuously operational since 2004, though production is now in decline. Kitan was operated by ENI Pty (Australia) and was engaged in extraction from 2011 to 2017. A third field, the Elang-Kakatua area, was operational between 2004 and 2008 but produced very minor amounts of condensate and light crude, so is not considered further in determining residence.

28. Mineral exploration, evaluation and support service activities in the JPDA have been conducted by enterprises from various countries, with some recent work legally organized as joint ventures with the Timor Gap Corporation. However, total estimated annual production values are small fractions of the value of extraction activities, so form a separate but very much secondary consideration in terms of residence. Currently, within the national accounts all such production is assumed to be imported so is not part of domestic production—though it is correctly included as an addition to capital formation.

29. Field-specific 'production-sharing contracts' (PSCs) were drafted to define the exploration, production and revenue-sharing arrangements between the Designated Authority and the contracted enterprise. The PSC for Bayu-Undan is publicly available, though partially redacted, while for Kitan the PSC is available in full.

30. Though the Bayu-Undan and Kitan contracts are distinct, they share fundamental terms of agreement. Of particular pertinence here, they specify that the contractor in each case:

a) Must provide all human, financial and technical resources for the performance of the petroleum activities;

b) Receives a majority share in petroleum revenue from the contract area;

c) Has exclusive rights to engage in petroleum operations in the designated area for a long period—20 years for Bayu-Undan, and either the exhaustion of reserves or the cessation of the Timor Sea Treaty for Kitan.

31. From (a) it is clear from the production perspective that in neither case can petroleum operations have been carried out jointly. Within each field, all extraction activities have been organized solely by the Australian firms contracted. The provision of capital equipment and intermediate consumption has been operated through Australia and the ownership and control of these inputs lies with the Australian firms. No Timorese enterprises or establishments ever engaged in extraction activities in Bayu-Undan or Kitan. In contrast, in other joint zones around the world, production by a single establishment or enterprise is genuinely split between two (or more) economic units resident in different economies, with each working together in a seamless operation, or alternatively, various establishments exist with clear ties to one or other of the countries administering the area.

32. From (b), while the allocation of primary income is not directly relevant in determining production residence, it should be noted that the 90/10 split of revenue between the Timor-Leste and Australian governments as set out in the *TST* relates only to portions of income generated from production. These comprise shares of first tranche petroleum (FTP)—for example, 10 percent of total oil and gas revenue before cost recovery, and 50 percent of profit oil—defined as petroleum revenue remaining after 'cost oil'—operational and capital costs (including decommissioning and, in the case of BU, a 27 percent mark-up)[9]—have been recovered and a split of tax on profits.

33. From (c), although JPDA contracts are very long, the Designated Authority retains certain rights over activity within the JPDA and hence is the legal owner of the mineral reserves. This means payments from contractors to the Designated Authority for distribution to Timor-Leste and Australia should be classified as rent,[10] as is presently done, and that the mineral reserves remain legal assets of the JPDA rather than being treated as sold to, and legally owned by the contractors, as would be the case if all ownership rights had been ceded.[11]

34. The legal ownership of the reserves does not, however, indicate the economic residence of the units extracting the mineral products. Extraction of mineral resources can only be undertaken by resident institutional units and those resources can only be owned by resident institutional units.[12] In this case, as sovereignty over the area is disputed and the *TST* explicitly does not determine Timor-Leste's or Australia's territorial entitlements, a split of the economic ownership of the reserves between the two countries cannot be observed, and nor can it be inferred from the income sharing arrangements.

35. In this case, by relying on the organization of production to determine economic residence, economic ownership of the reserves is determined by the same rationale. As the organization of production makes the Bayu-Undan and Kitan operators economically resident in Australia, and as mineral extraction and resource ownership can only be by resident institutional units, the mineral reserves are also economically owned by institutional units resident in Australia.

36. Based on the above, <u>no institutional units engaging in mineral extraction activities within the JPDA are considered to be resident in Timor-Leste</u>. The extent of national accounts statistics from 2002 to the present should accordingly be revised to reflect this recommendation, including large reductions in nominal and real GDP levels and large, offsetting increases in GNI levels; in both cases the variable nature of oil and gas extraction will likely also cause the respective growth rates of these series to be significantly revised.

37. The recommended residence changes will reclassify various flow and stock series, but they will have no impact on the underlying value of JPDA production and the revenues provided to the governments of Timor Leste and Australia. The reduction in GDP and offsetting increase in net property income from abroad, such that GNI remains unchanged, will

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[9] See paragraph 7.10 of the PSC for JPDA 03–12.

[10] See *2008 SNA*, paragraph 13.50.

[11,12] Ibid, paragraphs 17.340–17.343.

provide a clearer view of economic reality, as JPDA production involves very little domestic input but does provide heavy support to public finances. The residence change will in no way alter the revenues received by either Timor-Leste or Australia from JPDA production, only from where they originate. (The changes in GNI arise in respect of the income of the mining companies).

Impact on GDP and GNI

38. The removal of JPDA activity from GDP estimates will reduce GDP levels by up to 80 percent. Estimates of GDP in current, purchasers' prices in 2015, the most recent year published, would fall from around USD $3.1bn to $1.6bn or just under 50 percent; on average from 2012 to 2015, GDP would be reduced by 67 percent.

39. The reductions in GDP will be offset by increases in net property income such that GNI levels will remain unchanged. Reducing Timor-Leste' share of production will result in an equal, positive offset in the net property income it receives from overseas, which consists of various key components. Using the current GDS assumptions, four elements explain the impacts on GDP and GNI:

- **Value added (-)**: currently, 90 percent of JPDA value added is assumed to be from Timorese production. This will fall to zero.

- **Royalties and taxes (+)**: at present these are assumed to cancel out, as Timor-Leste records giving Australia a 10 percent share from its share of JPDA production (10 percent x 90 percent) and receiving from Australia a 90 percent share from its share of production (10 percent x 90 percent). This will switch to Australia being recorded as giving Timor-Leste 90 percent of 100 percent of production.

- **COE (no change*)**: presently the GDS assumes all JPDA employees are nonresident in Timor-Leste. This will be unaffected by the change in producing units' residence. (*However, under the present assumptions, GDS' GNI calculations should be recording 90 percent of COE generated in the JPDA as a primary income debit).

- **Net operating surplus (+)**: active and formerly active producing units have been foreign direct investment (FDI) enterprises. In principle, their distributable income—effectively net operating surplus (NOS)[13]—should be recorded as a primary income debit, either directly if dividends are remitted or via the imputed value of reinvested earnings if no dividends are remitted.[14] No FDI-related dividends are shown in the template table compiled by the GDS, implying imputation of reinvested earnings is required.[15] For Timor, this should be 90 percent of total NOS; for Australia, not all of the remaining 10 percent may be a debit if some JPDA

[13] Gross operating surplus *less* consumption of fixed capital.

[14] See *2008 SNA*, paragraph 7.139; also *BPM6*, paragraphs 11.40–11.47.

[15] Advice on how this series may be derived and its implications for series presently reported in the template tables is given in section B, paragraphs 54–55.

investors are ultimately resident. For Timor-Leste, the NOS debit will fall to zero, while it will increase for Australia by an equal amount.

40. The following numerical example illustrates this and is drawn from the illustrative table in Annex 2.

Scenario A (GDS assumption): 90 percent of JPDA activity is assumed to be in Timor-Leste and 10 percent in Australia

- Of total JPDA value added of 60, 54 is ascribed to Timor-Leste and 6 to Australia;
- Because the residence splits match the revenue-sharing splits in the *TST*, the property income flows between the two countries cancel out at 0 each;
- Of estimated NOS of 14, 12.6 is recorded as a debit from Timor-Leste to Australia (0.9 x 14); which Australia passes along the chain to the beneficial owners, along with its own NOS debit of 1.4 (0.1 x 14);
- Looking at GDP and net property income for each country, Timor-Leste has GDP= 54, GNI=36; and Australia has GDP=6, GNI=10.

Scenario B (recommended assumption): 0 percent of JPDA activity is assumed to be in Timor-Leste and 100 percent in Australia

- Of total JPDA value added of 60, 0 is ascribed to Timor-Leste (a loss of 54) and 60 to Australia (an increase of 54);
- Timor-Leste receives 90 percent of FTP (0.9 x 10) and taxes (0.9 x 10), plus it receives 90 percent of half of profit oil (0.9 x 0.5 x 40), giving total net property income of 36. This is all paid from Australia, which thus has net property income of -36;
- Of estimated NOS of 14, none is generated within Timor-Leste. The total of 14 is all generated in Australia so has no impact on Australia's primary income credits but is then, as before, passed entirely along the chain to the beneficial owners, resulting in a primary income debit of 14;
- Adding up GDP and net property income for each country, Timor-Leste has GDP= 0, GNI = 36; and Australia has GDP=60, GNI=10.

Hence, although a revised residence determination alters Timor-Leste and Australia's respective GDP levels, the resulting changes in net primary income leave both countries with unchanged GNI levels.

41. **All series relating to JPDA activity in GDP by production (GDP(P)), income (GDP(I)) and expenditure (GDP(E)) would need to be removed**. In more detail, Table 2 lists the main national accounts components and how they would be impacted by the residence change.

Table 2. Impact of Revised Determination of residence on Key National Accounts Components

JPDA component	Revised impact on GDP	Revised impact on GNI	Notes
Output	Remove from GDP(P)	-	
Intermediate consumption (IC)	Remove from GDP(P)	-	
Value added	Remove from GDP(P)	-	Reduction is greater than increase in GNI
Taxes on products	Remove from GDP(P)	Include 90 percent share as primary income credit	Revision has no impact on revenue received by ANPM and MOF
Subsidies on products	Remove from GDP(P) [already zero in JPDA]	Include 90 percent share as primary income debit	No impact on expenditure made by ANPM and MOF
Petroleum exports	Remove from GDP(E)	-	
Related Imports (goods and services supporting petroleum activity; exploration)	Remove from GDP(E)	-	Exploration also to be removed from GFCF
Gross fixed capital formation (GFCF) from exploration	Remove from GDP(E)		Also to be removed from imports
COE	Remove from GDP(I)	Include any resident workers' COE as primary income credit.	All workers currently assumed nonresident – likely incorrect (via BUCLCP evidence) – but if true, then there is a missing primary income debit in the template tables
Gross operating surplus	Remove from GDP(I)	-	
Dividends to government	-	Include any paid to TIMOR-LESTE as property income credit, remove any	

JPDA component	Revised impact on GDP	Revised impact on GNI	Notes
		debits from TIMOR-LESTE > ROW	
Net operating surplus	-	Remove imputed value for NOS from primary income debits	Assumes an imputed value is currently being made by GDS in the absence of any recorded dividends to nongovernment beneficiaries
Rent (royalties, bonuses, licenses, entitlements)	-	Include 90 percent share of JPDA revenues as primary income credits	No impact on revenue received by ANPM and MOF

Implementation Considerations

42. The revision to the residence of JPDA producing units will improve the accuracy and comparability of national accounts and other economic statistics, but the size of the change means careful consideration must be given to users' needs. This includes consulting in advance with ministries and agencies, including MOF, the MPNR and the ANPM, to explain the reasons behind the changes; and setting out a release plan that is coordinated with the BCTL (and ideally the ABS) and that minimizes disruption to key users. Release by end-2019 is recommended.

43. A dual presentation of 'revised' and 'former' national accounts estimates on the existing and revised determination of residences is recommended for the next few years, supported by clear and concise user guidance. Most key users are already familiar with the difficulties of ascribing JPDA activity between Timor-Leste and Australia. A form of dual presentation would allow them to identify familiar aggregate series alongside unfamiliar revised aggregates, supporting continuing and new economic analyses. In more detail with some initial suggestions:

- Notwithstanding the effect of suggested data and methods improvements set out in Section C/Annex 2, what is currently presented as 'Non-Oil Sector'[16] GDP would be renamed simply as 'GDP;' the existing GDP series could be renamed 'Old GDP' with 'Oil sector' GDP renamed '*of which JPDA*.' This approach would provide a direct link between the old and new approaches.

[16] GDS's release tables denote the oil industry and all non-oil industries as the 'oil sector' and 'non-oil sector' respectively, though neither is formally an institutional sector.

- The GNI total should remain the same, with the new, larger difference between GNI and GDP equal to the value of the 'Oil sector/*of which JPDA*' series

44. Various presentational options should be considered in order to identify the neatest and clearest solutions. In any event, the GDP release presenting the new estimates should include a detailed discussion of the revised determination of residence impact as well as table footnotes.

45. Explanatory text and footnotes should make it clear that the changes will bring Timor-Leste's national accounts into alignment with international best practice. The changes will bring about consistency between the GDS's national accounts and the BCTL's balance of payments estimates an—if coordination is timely—with national accounts and balance of payments estimates compiled for Australia by the ABS. They will not, however, have any impact on the revenue received by the ANPM and the Ministry of Finance—a point that should also be clearly emphasized.

46. The large difference between GDP and GNI requires policymakers and international observers to be more flexible than usual in their analyses and advice. GNI, and also gross national disposable income (GNI plus net secondary income from abroad, including foreign aid), should be considered where pertinent as complements or alternatives to GDP when calculating commonly used ratios, for example when analyzing debt and revenue.

47. A dual presentation would make it easier to adopt revised determination of residence should the new maritime treaty come into force. It would nevertheless be a complex task as the arrangements would likely require a new determination of residence rather than a reversion to anything assumed prior. This work would need to consider the nature of any activity at the Greater Sunrise field that straddles the border between the JPDA and territorial waters claimed by Australia.

48. Care should be taken, however, to consider the residence impact of any new treaty arrangements. While particular producing units may come to lie entirely within Timorese waters, others may still straddle international jurisdictions. It will be important to analyze these production arrangements thoroughly to determine each producing unit's residence, rather than reverting to the erroneous assumption that it must fall in line with agreed income shares.

Recommended actions:

- The GDS should remove JPDA production from estimates of domestic production, ideally by zeroing multiplication factors used in the 'Oil' spreadsheet, by end-December 2019.

- The GDS, in consultation with the BCTL, should reclassify any primary and secondary income earned by Timor-Leste from JPDA production (revenue shares; taxes; interest income; compensation of employees resident in Timor Leste) as being received from overseas in order to revise estimates of GNI and GNDI, by end-December 2019.

- The GDS should consult with key domestic data users and suppliers to determine an effective dual presentation of national accounts statistics based on the existing and revised determination of residences, beginning in March 2019 and concluding no later than November 2019.

- The GDS should consult with the ABS to discuss the residence revision and promote a coordinated adoption of the changes in ABS national accounts and external sector statistics, beginning in March 2019 and concluding no later than November 2019.

- The GDS should consult closely with the ANPM, MPNR and MOF to understand the residence implications for existing and future institutional units wholly or partly within the JPDA should the area become part of Timorese national waters, beginning in March 2019 and concluding if and when a new treaty comes into force.

B. Review of GDS Data and Methods for Oil and Gas Extraction

49. In line with the recommendation that the GDS continues to estimate oil and gas extraction activity, the following paragraphs summarize the main areas for improvement noted during the mission.

50. The mission reviewed the eight national accounts template tables set out in the *Guide* that GDS staff had populated in advance. The efforts of GDS compilation staff in this regard were extremely beneficial, as they allowed the mission to make immediate progress towards a key objective.

51. The data used by GDS compilers were broadly consistent with figures presented in the latest published set of GDP estimates, though some small discrepancies were noted. These included some likely errors in reported product taxes on oil production (Table 1.1—ascribed to VAT, which is not normally levied on exports) and minor differences in oil and gas production (also Table 1.1), potentially due to revisions in source data made by staff at the ANPM and/or the intermediary supplier, the Ministry of Finance.

52. Industrial coverage appears to be incomplete, which will understate GDP and GVA assuming positive value added is being missed. While oil and gas extraction (under the current GDS assumption of a 90–10 production split between Timor-Leste and Australia) dominates the entire economy, estimates of production of other mining activities (such as quarrying) include only a very small estimate of informal mining based on the Labour Force Survey. These estimates are included within GDP and should also be entered into the template tables. Production levels were noted to be low at resent during various official meetings but are expected by the *Instituto do Petróleo e Geologia* (IPG) and other agencies to increase in the near future – for example, marble quarrying. In addition, the GDS should attempt to quantify the value of any domestic exploration activity, such as aerial and seismic surveys; and also any mining support services.

53. The assumed share of employment costs in current production costs should be reviewed. Estimates of IC have been calculated since 2010 by deducting 15 percent from the total current expenditure figure provided by the MOF (Table 1.1). It is not clear how this percentage was derived but different assumptions would have a significant impact on IC and GVA. In addition, even where originally justified, fixed assumptions are unlikely to hold over longer periods of time.

54. Estimates of COE paid to nonresident JPDA workers under the present GDS residence determination are missing from the template table. If they were correctly included, there should be a primary income debit showing in template table 2, which would be removed under the revised residence determination. In addition, evidence (ANPM annual reports and discussions with ConocoPhillips on the Bayu-Undan Consolidated Local Content Plan (BUCLCP) strongly suggests some JPDA workers are resident in Timor-Leste. Work is recommended to review workers' economic residence in the first instance; if substantive, existing COE resident/nonresident series should be revised before applying the new determination of residence, under which COE paid to any workers resident in Timor-Leste should form a primary income credit.

55. Estimates of net operating surplus are needed within primary income. Producing units in the JPDA are part of FDI enterprises, which requires that NOS generated is either remitted back to the beneficial owners (a primary income debit) or held as retained earnings. In the case of the latter, an imputed value for NOS should be derived, which would form a primary income debit for reinvested earnings. As presently populated, Template Table 2 does not indicate any dividends paid to nongovernment beneficiaries, while no imputed values have been entered for reinvested earnings; these lead to overestimates of gross saving. These entries should be investigated by GDS staff, but, assuming such estimates do not appear in the main national accounts estimates, reinvested earnings should be imputed as: gross operating surplus (row 16) less consumption of fixed capital (row 30), while gross saving (row 27) should be equal to consumption of fixed capital.[17]

56. This in turn requires estimates of consumption of fixed capital. This could be made using information collected by the ANPM and/or MOF on capital costs. A potential source may be the amounts set aside annually by operators to feed into the decommissioning reserves, as required under the PSCs, though it should be checked if these values include the depreciation of capital assets or purely relate to the expected cost of decommissioning.

57. No entries have been made (Table 2) for interest income received. However, values are shown in ANPM 'monthly FACTS data,'[18] while estimates of royalties and dividends should be

[17] i.e., net saving should be zero—see *2008 SNA*, paragraph. 7.139.

[18] Available at:
http://web01.anpm.tl/webs/anptlweb.nsf/pgLafaekActivityList?openview&RestrictToCategory=Feb-2019.

compared with administrative data compiled by the ANPM and/or MOF. Taxes on income should be verified against GFS figures (Table 2.1).

58. No estimates have been made by the GDS for depletion of known reserves or reserve levels. An initial step should be to examine/request ANPM and other source data to get some estimates for the JPDA. Useful further information may be available from the Extractive Industry Transparency Initiative (EITI), or alternatively local EITI officials may be willing to support any GDS requests to government agencies and JPDA enterprises, as this work strongly overlaps with the EITI's primary objective to foster greater transparency in mineral resource management.

59. Discrepancies exist between nominal estimates of oil and gas production compiled by the MOF and the ANPM. This may partly relate to cash-to-accruals adjustments made by the MOF, but it may also reflect different assumptions about realized sale prices, data for which do not appear to be publicly available. It is presumed that for the purposes of accurate revenue calculation in line with JPDA contracts, the ANPM and also the MOF have such data and may be able to explain to the GDS the causes of these discrepancies. As for reserves, EITI officials may also have further insights on the cause of these differences.

60. The prices used to value components of production should be reviewed to ensure they reflect any timing issues. As all exploration and evaluation services are assumed to be imported, output for the oil sector comprises market sales plus changes in inventories of finished goods (there is no work-in-progress for oil and gas products). For the purposes of determining JPDA revenue to be allocated to the Designated Authority, prices realized at the point of sale are used. However, if sales are based on advance contracts, lagged adjustments may be required in order to reflect the nominal value of sales on an accruals basis. If any inventories existed or exist, changes should be valued using the prevailing prices at the point of entry and agreed prices at the (accruals basis) point of withdrawal, less the value of any recurrent losses due to, for example, deterioration or wastage. Sales and changes in inventories of finished goods in volume terms must also take account of these pricing issues.

61. Estimates of constant price oil GDP should be updated using more appropriate methods to calculate volume IC. The current GDS method deflates current price IC by the WEO composite index of commodity prices (including agricultural products). This is unlikely to reflect the composite price change of products used up in the oil and gas extraction process. Given the activity of Australian enterprises in the JPDA, a composite producer price index (PPI) deflator could be constructed using shares of extractive industry IC by product from the Australian supply and use table (SUT) for 2015 (the Timor-Leste GDP base year) to weight together corresponding Australian PPIs, adjusted for Australian dollar (AUD) to US dollar (USD) exchange rates, to form a new composite deflator. The mission made good progress on the SUT analysis but further assistance from the ABS is required to locate PPIs at an appropriate level of aggregation.

62. Estimates of net taxes on products in constant prices are derived via deflation, which is not recommended. Taxes and subsidies on products do not have natural volume and price components, so the recommended approach is to ensure the growth rate of a given tax (or subsidy) equals the growth rate in the volume component to which it relates—for example, a tax on oil sales should be assumed to grow in volume terms at the same rate as the constant price series for household consumption of oil. This may be achieved mathematically either by multiplying the base year tax level by the parent series volume growth rate, or by multiplying the volume level of the parent series by the tax rate in the base year.

63. **TA was provided on the compilation of an SUT for the extractive industries**. The GDS model uses export values to represent Output and specific import values (supplied by MOF) to represent IC. GDS staff were shown how to populate elements of domestic supply and imports by industry and product; IC by industry and product; and exports by product.

64. **The mission investigated the possibility of measuring oil and gas extraction on a quarterly basis (Tables 7 and 8).** Data collected by the ANPM, MOF and BCTL (in some cases, likely the same data shared between each agency) appears to be monthly or daily in its original form. The GDS should work to obtain Excel files from source owners.

Recommended Actions:

- The GDS should work with the ANPM, MOF and the EITI to understand and resolve where appropriate discrepancies between each agency's JPDA production and income (including dividends or retained earnings (NOS); and interest income) information, by end-June 2019.
- The GDS should forge stronger links with the EITI to improve its data sources and compare/improve its measurement assumptions.
- The GDS should work with the ANPM and other agencies serving the minerals sector to review the scale of non-JPDA activities, including oil activities in Timor-Leste's territorial waters, quarrying, and exploration and evaluation services, by end-June 2019.
- The GDS should work with MOF to review and potentially revise the assumed share of COE in JPDA production costs, by end-September 2019.
- The GDS should work with MOF to understand the timing of prices used to value JPDA production and potentially lag these to reflect national accounts valuation principles, by end-September 2019.
- The GDS should develop a new model to deflate oil and gas production (as described in paragraph 57, Annex 3) by end-September 2019.
- The GDS should estimate taxes and subsidies on products using the volume changes in the underlying series to which they relate, by end-September 2019.

- The GDS should work with the ANPM, MOF, the EITI and other agencies involved in the mining sector to obtain any available sub-annual production and income data, by end-February 2020.

C. Officials Met During the Mission

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Annex I. Timor-Leste Template Tables 1–8

(as of December 2018)

Template Table 1. Proportion of Natural Resource Industries to GDP							
Row	**Description**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
A.	**Output (Millions US Dollars)**						
1	Mining of coal and lignite (ISIC Division 05)						
2	Extraction of crude petroleum and natural gas (ISIC Division 06)	6,394.8	5,207.6	3,810.1	2,253.4	1,394.9	1,482.2
3	Mining of metal ores (ISIC Division 07)						
4	Other mining and quarrying (ISIC Division 08)						
5	Mining support service activities (ISIC Division 09)						
6	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
7	Transport via pipeline (ISIC Class 4930[b])						
8	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
9	**Natural Resource Industries [sum rows 1 to 8]**	6,394.8	5,207.6	3,810.1	2,253.4	1,394.9	1,482.2
10	**All Industries in the Economy**	9,385.7	8,233.6	7,046.5	5,400.7	4,532.3	4,359.3
B.	**Value Added (Millions US Dollars)**						
11	Mining of coal and lignite (ISIC Division 05)						
12	Extraction of crude petroleum and natural gas (ISIC Division 06)	5,470.9	4,225.5	2,577.6	1,473.1	814.4	888.9
13	Mining of metal ores (ISIC Division 07)						
14	Other mining and quarrying (ISIC Division 08)						
15	Mining support service activities (ISIC Division 09)						
16	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
17	Transport via pipeline (ISIC Class 4930[b])						
18	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
19	**Natural Resource Industries [sum rows 11 to 18]**	5,470.9	4,225.5	2,577.6	1,473.1	814.4	888.9
20	**All Industries in the Economy**	6,717.6	5,657.6	4,036.6	3,051.2	2,488.6	2,511.1
C.	**Taxes on Products[d] (Millions US Dollars)**						
21	Mining of coal and lignite (ISIC Division 05)						
22	Extraction of crude petroleum and natural gas (ISIC Division 06)	6.5	8.9	13.4	22.6	5.1	5.8
23	Mining of metal ores (ISIC Division 07)						
24	Other mining and quarrying (ISIC Division 08)						
25	Mining support service activities (ISIC Division 09)						
26	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
27	Transport via pipeline (ISIC Class 4930[b])						
28	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
29	**Natural Resource Industries [sum rows 21 to 28]**	6.5	8.9	13.4	22.6	5.1	5.8
30	**All Industries in the Economy**	67.8	73.3	84.1	91.3	83.9	82.4
D.	**Subsidies on Products (Millions US Dollars)**						
31	Mining of coal and lignite (ISIC Division 05)						
32	Extraction of crude petroleum and natural gas (ISIC Division 06)	0.0	0.0	0.0	0.0	0.0	0.0
33	Mining of metal ores (ISIC Division 07)						
34	Other mining and quarrying (ISIC Division 08)						
35	Mining support service activities (ISIC Division 09)						
36	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
37	Transport via pipeline (ISIC Class 4930[b])						
38	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
39	**Natural Resource Industries [sum rows 31 to 38]**	0.0	0.0	0.0	0.0	0.0	0.0
40	**All Industries in the Economy**	72.1	78.2	79.5	59.1	49.1	8.0
E.	**Value Added + Taxes less Subsidies on Products [B + C – D] (Millions US Dollars)**						
41	Mining of coal and lignite (ISIC Division 05)						
42	Extraction of crude petroleum and natural gas (ISIC Division 06)	5,477.4	4,234.4	2,591.0	1,495.7	819.5	894.7
43	Mining of metal ores (ISIC Division 07)						
44	Other mining and quarrying (ISIC Division 08)						
45	Mining support service activities (ISIC Division 09)						
46	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
47	Transport via pipeline (ISIC Class 4930[b])						
48	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
49	**Natural Resource Industries**	5,477.4	4,234.4	2,591.0	1,495.7	819.5	894.7
50	**All Industries in the Economy[e, f]**	6,713.2	5,652.7	4,041.3	3,083.4	2,523.5	2,585.6
F.	**Share of GDP [E / (50)] (percent)**						
51	Mining of coal and lignite (ISIC Division 05)						
52	Extraction of crude petroleum and natural gas (ISIC Division 06)	81.6	74.9	64.1	48.5	32.5	34.6
53	Mining of metal ores (ISIC Division 07)						
54	Other mining and quarrying (ISIC Division 08)						
55	Mining support service activities (ISIC Division 09)						
56	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
57	Transport via pipeline (ISIC Class 4930[b])						
58	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
59	**Natural Resource Industries**	81.6	74.9	64.1	48.5	32.5	34.6
60	**All Industries in the Economy**	**100**	**100**	**100**	**100**	**100**	**100**

Template Table 2. Distribution of the Income of Natural Resource Enterprises (Millions US Dollars)							
Row	**Description**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
1	**Output of the Natural Resource Industries at Basic Prices, Comprising:**	6,394.8	5,207.6	3,810.1	2,253.4	1,394.9	1,482.2
2	Natural resource products						
3	Other products						
4	**Intermediate Consumption of the Natural Resource Industry at Purchasers' Prices, Comprising:**	924.0	982.1	1,232.5	780.3	580.5	593.3
5	From domestic units, excluding government						
6	Fees and other purchases of government services						
7	Imported	924.0	982.1	1,232.5	780.3	580.5	593.3
8	**Value Added at Basic Prices [(1) – (4)]**	5,470.9	4,225.5	2,577.6	1,473.1	814.4	888.9
9	**Compensation of Employees**	53.7	63.8	97.0	72.9	40.2	43.4
10	Payable to residents						
11	Payable to nonresidents	53.7	63.8	97.0	72.9	40.2	43.4
12	**Other Taxes Less Subsidies on Production**	0.0	0.0	0.0	0.0	0.0	0.0
13	Other taxes on production	0.0	0.0	0.0	0.0	0.0	0.0
14	Other subsidies on production	0.0	0.0	0.0	0.0	0.0	0.0
15	**Gross Operating Surplus**	5,417.1	4,161.7	2,480.6	1,400.2	774.2	845.5
16	**Property Income, Payments net of Receipts**[a]	4,340.9	3,185.3	1,813.9	1,022.8	791.2	633.0
17	Interest						
18	Dividends	2,603.2	1,700.4	918.1	536.2	517.2	326.3
19	Of which, to government	2,603.2	1,700.4	918.1	536.2	517.2	326.3
20	Reinvested earnings on foreign direct investment						
21	Rent (royalties[b], bonuses, licenses, and production entitlements)	1,737.7	1,484.9	895.7	486.6	274.0	306.7
22	Of which, to government	1,737.7	1,484.9	895.7	486.6	274.0	306.7
23	**Current Transfers, Payments net of Receipts**[a]	0.0	0.0	0.0	0.0	0.0	0.0
24	Taxes on income and other current taxes						
25	Net transfers from state owned enterprises						
26	Other current transfers						
27	**Gross Saving [(15) – (16) – (23)]**	1,076.3	976.4	666.7	377.5	-17.0	212.5
28	**Gross Capital Formation**	62.6	61.4	42.0	5.7	4.8	11.4
29	Gross fixed capital formation						
30	Consumption of fixed capital						
31	Net fixed capital formation						
32	Changes in inventories						
33	**Capital Transfers (paid less received)**[a]						
34	**Acquisitions less Disposals of Nonproduced Nonfinancial Assets**						
35	**Net Lending (+) / Net Borrowing (-) [(27) – (28) – (33) – (34)]**	1,013.6	915.1	624.7	371.8	-21.8	201.2
Addendum							
36	Total government revenue related to natural resources[c]						
37	Total government revenue from all sources						
38	Exports of natural resource products[d]	6,401.3	5,216.5	3,823.5	2,276.0	1,400.0	1,488.0
39	Exports of goods and services	6,525.6	5,310.4	3,897.7	2,326.5	1,457.7	
40	Depletion of reserves						
41	Depletion-adjusted net value added [Template Table 1, (20) – (30) – (40)]						
42	Value of reserves						
43	Total assets						

Template Table 3. Labor in the Natural Resource Industries							
Row	**Description**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
A.	**Compensation of Employees**[a] **(Millions US Dollars)**						
1	Natural resource industries	53.7	63.8	97.0	72.9	40.2	43.4
2	All other industries	287.7	293.0	329.9	328.5	343.4	332.3
3	All industries	341.4	356.8	426.9	401.4	383.7	375.7
B.	[b]**Employees (persons)**						
4	Natural resource industries						
	of which female						
5	All other industries						
	of which female						
6	All industries				388,952		
	of which female				160,563		
C.	**Compensation of Employees per unit of Labor [A / B] (Dollars)**						
7	Natural resource industries						
8	All other industries						
9	All industries				1,032.0		
D.	**Compensation of Employees as a share of Value Added**[c] **[100 × A / Value Added] (percent)**						
10	Natural resource industries	1.0	1.5	3.8	4.9	4.9	4.9
11	All other industries	23.1	20.5	22.6	20.8	20.5	20.5
12	All industries	5.1	6.3	10.6	13.2	15.4	15.0

Template Table 4. Contributions of the Natural Resource Industries to Volume Change in GDP

Row	Description	2012	2013	2014	2015	2016	2017
A.	**Value Added in Base Year Prices[a] (Millions US Dollars)**						
1	Mining of coal and lignite (ISIC Division 05)						
2	Extraction of crude petroleum and natural gas (ISIC Division 06)	2,445.0	1,977.9	1,007.2	1,473.1	1,430.6	1,203.2
3	Mining of metal ores (ISIC Division 07)						
4	Other mining and quarrying (ISIC Division 08)						
5	Mining support service activities (ISIC Division 09)						
6	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
7	Transport via pipeline (ISIC Class 4930)						
8	Service activities incidental to land transportation (ISIC Class 5221)						
9	**Natural Resource Industries [sum rows 1 to 8]**	2,445.0	1,977.9	1,007.2	1,473.1	1,430.6	1,203.2
10	**All Other Industries**	1,391.4	1,464.4	1,494.7	1,578.1	1,656.5	1,501.6
11	**Taxes less Subsidies on Products**	42.6	44.2	49.1	32.2	21.3	76.1
12	**Gross Domestic Product**	3,879.1	3,486.5	2,551.0	3,083.4	3,108.5	2,780.9
B.	**Value Added of the Previous Period in Base Year Prices[b] (Millions US Dollars)**						
13	Mining of coal and lignite (ISIC Division 05)						
14	Extraction of crude petroleum and natural gas (ISIC Division 06)	2,324.4	2,445.0	1,977.9	1,007.2	1,473.1	1,430.6
15	Mining of metal ores (ISIC Division 07)						
16	Other mining and quarrying (ISIC Division 08)						
17	Mining support service activities (ISIC Division 09)						
18	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
19	Transport via pipeline (ISIC Class 4930)						
20	Service activities incidental to land transportation (ISIC Class 5221)						
21	**Natural Resource Industries [sum rows 13 to 20]**	2,324.4	2,445.0	1,977.9	1,007.2	1,473.1	1,430.6
22	**All Other Industries**	1,330.8	1,391.4	1,464.4	1,494.7	1,578.1	1,656.5
23	**Taxes less Subsidies on Products**	49.9	42.6	44.2	49.1	32.2	21.3
24	**Gross Domestic Product**	3,705.1	3,879.1	3,486.5	2,551.0	3,083.4	3,108.5
C.	**Contribution to Volume Change in GDP [100 × (A – B) / (24)] (percentage points)**						
25	Mining of coal and lignite (ISIC Division 05)						
26	Extraction of crude petroleum and natural gas (ISIC Division 06)	3.3	-12.0	-27.8	18.3	-1.4	-7.3
27	Mining of metal ores (ISIC Division 07)						
28	Other mining and quarrying (ISIC Division 08)						
29	Mining support service activities (ISIC Division 09)						
30	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
31	Transport via pipeline (ISIC Class 4930)						
32	Service activities incidental to land transportation (ISIC Class 5221)						
33	**Natural Resource Industries [sum rows 25 to 32]**	3.3	-12.0	-27.8	18.3	-1.4	-7.3
34	**All Other Industries**	1.6	1.9	0.9	3.3	2.5	-5.0
35	**Taxes less Subsidies on Products**	-0.2	0.0	0.1	-0.7	-0.4	1.8
36	**Gross Domestic Product**	4.7	-10.1	-26.8	20.9	0.8	-10.5

Template Table 5. Contributions of Prices Paid and Received by the Natural Resource Industries to the Cumulative Change in GDP Implicit Deflator since the Base Year

Row	Description	2012	2013	2014	2015	2016	2017
A.	**Value Added in Current Prices (Millions US Dollars)**						
1	Mining of coal and lignite (ISIC Division 05) [Template Table 1, (11)]						
2	Extraction of crude petroleum and natural gas (ISIC Division 06) [Template Table 1, (12)]	5,470.9	4,225.5	2,577.6	1,473.1	814.4	888.9
3	Mining of metal ores (ISIC Division 07) [Template Table 1, (13)]						
4	Other mining and quarrying (ISIC Division 08) [Template Table 1, (14)]						
5	Mining support service activities (ISIC Division 09) [Template Table 1, (15)]						
6	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420) [Template Table 1, (16)]						
7	Transport via pipeline (ISIC Class 4930) [Template Table 1, (17)]						
8	Service activities incidental to land transportation (ISIC Class 5221) [Template Table 1, (18)]						
9	**Natural Resource Industries [Template Table 1, (19)]**	5,470.9	4,225.5	2,577.6	1,473.1	814.4	888.9
10	**All Other Industries [Template Table 1, (20) – (9)]**	1,246.7	1,432.1	1,459.0	1,578.1	1,674.2	1,622.2
11	**Taxes less Subsidies on Products [Template Table 1, (30) – Template Table 1, (40)]**	-4.3	-5.0	4.7	32.2	34.9	74.4
12	**Gross Domestic Product [Template Table 1, (50)]**	6,713.2	5,652.7	4,041.3	3,083.4	2,523.5	2,585.6
B.	**Contribution to change in GDP Deflator (percentage points) [100 × (A – Template Table 4, A) / Template Table 4, (12)] (percentage points)**						
13	Mining of coal and lignite (ISIC Division 05)						
14	Extraction of crude petroleum and natural gas (ISIC Division 06)	45.1	39.8	38.9	0.0	-24.4	-12.2
15	Mining of metal ores (ISIC Division 07)						
16	Other mining and quarrying (ISIC Division 08)						
17	Mining support service activities (ISIC Division 09)						
18	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
19	Transport via pipeline (ISIC Class 4930)						
20	Service activities incidental to land transportation (ISIC Class 5221)						
21	**Natural Resource Industries [sum rows 13 to 20]**	45.1	39.8	38.9	0.0	-24.4	-12.2
22	**All Other Industries**	-2.2	-0.6	-0.9	0.0	0.7	4.7
23	**Taxes less Subsidies on Products**	-0.7	-0.9	-1.1	0.0	0.5	-0.1
24	**Gross Domestic Product**	42.2	38.3	36.9	0.0	-23.2	-7.6

Template Table 6. Terms of Trade Index [a]							
Row	**Description**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
A: Index Numbers							
1	Implicit Deflator – Exports of Goods and Services	201.7	189.2	188.8	100.0	69.0	
2	Implicit Deflator – Imports of Goods and Services	123.2	123.9	120.2	100.0	94.8	
3	Terms of Trade Index [100 × (1) / (2)]	163.8	152.7	157.1	100.0	72.8	
4	Implicit Deflator – Exports of Goods and Services excluding natural resources	106.3	100.2	104.0	100.0	99.0	
5	Implicit Deflator – Imports of Goods and Services excluding natural resources	116.0	116.5	114.7	100.0	95.4	
6	Terms of Trade Index – excluding natural resources [100 × (4) / (5)]	91.6	86.0	90.7	100.0	103.9	
7	Implicit Deflator – GDP	171.0	162.7	157.5	100.0	80.5	
8	Implicit Deflator - Gross Domestic Final Expenditure	97.3	103.1	101.9	100.0	98.6	
9	Effect of export and import prices on real gross domestic income[b] [100 × (7) / (8)]	175.8	157.7	154.5	100.0	81.7	
10	Implicit Deflator - GDP excluding exports and imports of natural resources	82.9	95.3	94.1	100.0	100.4	
11	Effect of export and import prices on real gross domestic income excluding natural resources [100□× (10) / (8)]	85.3	92.4	92.3	100.0	101.9	
B: Percentage Change since Preceding Period							
12	Implicit Deflator – Exports of Goods and Services	6.5	-6.2	-0.2	-47.0	-31.0	
13	Implicit Deflator – Imports of Goods and Services	2.8	0.6	-3.0	-16.8	-5.2	
14	Terms of Trade Index [□(12) – (13)]	3.6	-6.8	2.9	-36.3	-27.2	
15	Implicit Deflator – Exports of Goods and Services excluding natural resources	-2.6	-5.7	3.8	-3.9	-1.0	
16	Implicit Deflator – Imports of Goods and Services excluding natural resources	10.7	0.4	-1.5	-12.8	-4.6	
17	Terms of Trade Index – excluding natural resources [□(15) – (16)]	-12.1	-6.1	5.4	10.2	3.9	
18	Implicit Deflator – GDP	11.9	-4.8	-3.2	-36.5	-19.5	
19	Implicit Deflator - Gross Domestic Final Expenditure	7.7	6.0	-1.2	-1.9	-1.4	
20	Effect of export and import prices on real gross domestic income[b] [□(18) – (19)]	3.8	-10.3	-2.0	-35.3	-18.3	
21	Implicit Deflator - GDP excluding exports and imports of natural resources	6.0	15.0	-1.3	6.3	0.4	
22	Effect of export and import prices on real gross domestic income excluding natural resources [□(21) – (19)]	-1.6	8.4	-0.1	8.3	1.9	

Template Table 7. Quarterly Indicators[a] of the Contributions of the Natural Resource Industries to GDP							
Row	**Description**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
A. GDP × Production in current prices (Millions US Dollars)							
1	Mining value added (ISIC Section B)	5,470.9	4,225.5	2,577.6	1,473.1	814.4	888.9
2	All other industries value added	1,246.7	1,432.1	1,459.0	1,578.1	1,674.2	1,622.2
3	Taxes less subsidies on products	-4.3	-5.0	4.7	32.2	34.9	74.4
4	Gross domestic product [(1) + (2) + (3)]	6,713.2	5,652.7	4,041.3	3,083.4	2,523.5	2,585.6
B. GDP × Production in current prices [100 x A / (4)] (percent)							
5	Mining value added (ISIC Section B)	81.5	74.8	63.8	47.8	32.3	34.4
6	All other industries value added	18.6	25.3	36.1	51.2	66.3	62.7
7	Taxes less subsidies on products	-0.1	-0.1	0.1	1.0	1.4	2.9
8	Gross domestic product	100.0	100.0	100.0	100.0	100.0	100.0
C. GDP × Production in base year prices[b] (Millions US Dollars)							
9	Mining value added (ISIC Section B)	2,445.0	1,977.9	1,007.2	1,473.1	1,430.6	1,203.2
10	All other industries value added	1,391.4	1,464.4	1,494.7	1,578.1	1,656.5	1,501.6
11	Taxes less subsidies on products	42.6	44.2	49.1	32.2	21.3	76.1
12	Gross domestic product [(9) + (10) + (11)]	3,879.1	3,486.5	2,551.0	3,083.4	3,108.5	2,780.9
D. GDP × Production, corresponding quarter of previous year, in base year prices[b] (Millions US Dollars)							
13	Mining value added (ISIC Section B)	2,324.4	2,445.0	1,977.9	1,007.2	1,473.1	1,430.6
14	All other industries value added	1,330.8	1,391.4	1,464.4	1,494.7	1,578.1	1,656.5
15	Taxes less subsidies on products	49.9	42.6	44.2	49.1	32.2	21.3
16	Gross domestic product [(13) + (14) + (15)]	3,705.1	3,879.1	3,486.5	2,551.0	3,083.4	3,108.5
E. Contribution to annual volume change in GDP [100 × (C – D) / (16)] (percentage points)							
17	Mining value added (ISIC Section B)	3.3	-12.0	-27.8	18.3	-1.4	-7.3
18	All other industries value added	1.6	1.9	0.9	3.3	2.5	-5.0
19	Taxes less subsidies on products	-0.2	0.0	0.1	-0.7	-0.4	1.8
20	Gross domestic product	4.7	-10.1	-26.8	20.9	0.8	-10.5
F. Implicit deflator [100 × A / C]							
21	Mining value added (ISIC Section B)	223.8	213.6	255.9	100.0	56.9	73.9
22	All other industries value added	89.6	97.8	97.6	100.0	101.1	108.0
23	Taxes less subsidies on products	-10.2	-11.2	9.5	100.0	163.4	97.9
24	Gross domestic product	173.1	162.1	158.4	100.0	81.2	93.0

Template Table 8. Quarterly Indicators[a] of the Contributions of Natural Resources to Exports of Goods and Services							
Row	Description	2012	2013	2014	2015	2016	2017
A.	**Exports of Goods and Services in Current Prices (Millions US Dollars)**						
1	Natural resource products	6,401.3	5,216.5	3,823.5	2,276.0	1,400.0	1,488.0
2	Other products	124.2	93.9	74.2	50.5	57.6	
3	Exports of goods and services [(1) + (2)]	6,525.6	5,310.4	3,897.7	2,326.5	1,457.7	
B.	**Exports of Goods and Services in Current Prices [100 × A / (3)] (percent)**						
4	Natural resource products	98.1	98.2	98.1	97.8	96.0	
5	Other products	1.9	1.8	1.9	2.2	4.0	
6	Exports of goods and services	100.0	100.0	100.0	100.0	100.0	100.0
C.	**Exports of Goods and Services in Base Year Prices[b] (Millions US Dollars)**						
7	Natural resource products	3,117.9	2,712.7	1,992.8	2,276.0	2,053.7	1,881.5
8	Other products	116.9	93.7	71.3	50.5	58.2	
9	Exports of goods and services [(7) + (8)]	3,234.8	2,806.3	2,064.1	2,326.5	2,111.9	
D.	**Exports of Goods and Services, Corresponding Quarter of Previous Year, in Base Year Prices[b] (Millions US Dollars)**						
10	Natural resource products	2,827.1	3,117.9	2,712.7	1,992.8	2,276.0	2,053.7
11	Other products	89.4	116.9	93.7	71.3	50.5	58.2
12	Exports of goods and services [(10) + (11)]	2,916.5	3,234.8	2,806.3	2,064.1	2,326.5	2,111.9
E.	**Contribution to Annual Volume Change in Exports of Goods and Services [100 × (C – D) / (12)] (percentage points)**						
13	Natural resource products	10.0	-12.5	-25.7	13.7	-9.6	-8.2
14	Other products	0.9	-0.7	-0.8	-1.0	0.3	
15	Exports of goods and services	10.9	-13.2	-26.4	12.7	-9.2	
F.	**Implicit Deflator [100 × A / C]**						
16	Natural resource products	205.3	192.3	191.9	100.0	68.2	79.1
17	Other products	106.3	100.2	104.0	100.0	99.0	
18	Exports of goods and services	201.7	189.2	188.8	100.0	69.0	

Annex II. Example of How Changes in JPDA Residence Affect GDP and GNI

Illustrative example - JPDA splits

			Explanatory notes
Primary income from oil splits (royalty, profit oil, tax)			
	Timor-Leste	*0.9*	*Defined in PSC*
	Australia	*0.1*	*"*
JPDA output		100	
Royalties (10%)		10	*Shared using PI split*
IC		40	
Total JPDA value added		60	*Split using residency assumption*
COE (all to non-residents)		6	*Assumed 15% of IC, same as in present GDP calculations*
Cost recovery (CFC)		10	
Cost oil (CFC + IC)		50	
Profit oil (to be shared under PSC)		40	
Profit split		*0.50*	*Contractor retains half, other half shared using PI split*
Retained earnings (NOS)		14	*Contractors' share of profit oil less COE*
Tax		10	*Shared using PI split*

Timor-Leste						*ABS*				*GDS*	
Residence assumption (%)	*0*	*10*	*20*	*30*	*40*	*50*	*60*	*70*	*80*	*90*	*100*
Value-added	0.0	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0	60.0
PI credit - royalties	9.0	8.1	7.2	6.3	5.4	4.5	3.6	2.7	1.8	0.9	0.0
PI credit - profits	18.0	16.2	14.4	12.6	10.8	9.0	7.2	5.4	3.6	1.8	0.0
PI credit - tax	9.0	8.1	7.2	6.3	5.4	4.5	3.6	2.7	1.8	0.9	0.0
PI credit - COE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PI credit - reinvested earnings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PI debit- royalties	0.0	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.7	-0.8	-0.9	-1.0
PI debit - profits	0.0	-0.2	-0.4	-0.6	-0.8	-1.0	-1.2	-1.4	-1.6	-1.8	-2.0
PI debit - tax	0.0	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.7	-0.8	-0.9	-1.0
PI debit - COE	0.0	-0.6	-1.2	-1.8	-2.4	-3.0	-3.6	-4.2	-4.8	-5.4	-6.0
PI debit - reinvested earnings	0.0	-1.4	-2.8	-4.2	-5.6	-7.0	-8.4	-9.8	-11.2	-12.6	-14.0
Net primary income	36.0	30.0	24.0	18.0	12.0	6.0	0.0	-6.0	-12.0	-18.0	-24.0
GNI	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0

Australia											
Residence assumption (%)	*100*	*90*	*80*	*70*	*60*	*50*	*40*	*30*	*20*	*10*	*0*
Value-added	60.0	54.0	48.0	42.0	36.0	30.0	24.0	18.0	12.0	6.0	0.0
PI credit - royalties	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
PI credit - profits	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
PI credit - tax	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
PI credit - COE	0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0
PI credit - reinvested earnings	0.0	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0
PI debit- royalties	-9.0	-8.1	-7.2	-6.3	-5.4	-4.5	-3.6	-2.7	-1.8	-0.9	0.0
PI debit - profits	-18.0	-16.2	-14.4	-12.6	-10.8	-9.0	-7.2	-5.4	-3.6	-1.8	0.0
PI debit - tax	-9.0	-8.1	-7.2	-6.3	-5.4	-4.5	-3.6	-2.7	-1.8	-0.9	0.0
PI debit - COE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PI debit - reinvested earnings	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0
Net primary income	-50.0	-44.0	-38.0	-32.0	-26.0	-20.0	-14.0	-8.0	-2.0	4.0	10.0
GNI	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Explanatory notes

- Numbers are purely illustrative, though the proportions used equal or approximate to those defined in the TST and/or respective PSCs

- The sequence of deductions from oil and gas production revenues is complex, with the FTP royalty deducted from output; profit sharing derived from (no more than) half of the profit remaining after 'cost oil' is deducted, and tax revenue derived from revenue less royalties and shared profits.

- When an assumed change in residence splits is applied, the amount of GVA on a national accounts basis that is switched from one economy to the other is offset by an equal change in net primary income, assuming all components are appropriately measured or (in the case of FDI enterprises' reinvested earnings) imputed. The rows shown in purple text are currently not populated in the template tables provided by the GDS, but evidence and national accounts principles indicate that estimates are required in both instances.

- For simplicity, it is assumed here, that all FDI goes through Australia and all reinvested earnings relate to FDI investors resident outside of Australia and Timor-Leste, but it is recognized in reality that some FDI shares may be owned by investors resident in Australia.

- Estimates of capital cost recovery may vary according to production levels, but over the lifetime of a project should equal the producer's accounting estimate of depreciation, notwithstanding any agreed uplift but including annual present value estimates of decommissioning costs. This may not be wholly consistent with estimates of the consumption of fixed capital as measured in the national accounts (which will assume a fixed life length for the assets that may differ from those assumed in the projects accounts), but commercial accounting information should be used as a strong preference simply to assuming zero consumption of fixed capital.

Annex III. Suggested Method to Estimate Intermediate Consumption in Constant Prices

- GDS does not have complete production data for the Oil sector, which would enable it to come up with better estimates of intermediate consumption in constant prices, as well as allowing a more complete population of the separate oil/gas SUT

- The recommended solution is to use ABS SUT information on the composition of IC in the Australian Oil/Gas industry, relevant Australian PPIs by product, and the AUD: USD exchange rate. In more detail:

- The ABS SUTs will have IC values for 2015 for the oil and gas industry (or industries if separated) by product, from which IC shares by product can be calculated.

- The ABS PPI series will include PPIs for each of the IC products above. Using the IC shares in (i) the individual PPI series can be weighted together to form a composite PPI for Oil and Gas IC that—on the assumption that the overall production technology used in Australian oil and gas extraction approximates the specific production technologies used by Australian-resident enterprises extracting oil and gas in the JPDA—appropriately reflects JPDA oil and gas extraction input price changes.

- However, as Timor-Leste uses the USD, this series must be adjusted for the AUD:USD exchange rate to reflect JPDA input cost price changes for the notional JPDA production units assumed to be resident in Timor-Leste.