The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Oil Watch: Reconciliation of JODI and EIA C+C Production Data

Posted by Euan Mearns on January 17, 2013 - 5:50am

Executive Summary

Oil production and consumption data reported by JODI (Joint Organisations Data Initiative) is reported to JODI by national governments giving us reason to believe that this may be the most reliable data set upon which to base interpretations about national and global oil supply and demand. However, the JODI data set is incomplete. 15 countries that report production data to JODI have incomplete returns since the project began in January 2002. Furthermore, there are 15 countries for which the EIA (US Energy Information Agency) report data that do not report to JODI at all. Based on the observation that JODI and EIA C+C (crude oil + lease condensate) data for OECD countries are very closely aligned we have used EIA data to patch the gaps in the JODI data set. This has produced a very close alignment between JODI and EIA global C+C data (Figure 1) and since the JODI data is based on returns from national governments, this in turn provides confidence in the veracity of the EIA data which is more complete and easier to use.

The IEA (International Energy Agency) and BP (British Petroleum) do not report C+C separately and so cannot be compared to the EIA and JODI (corrected) C+C data. However, there is good alignment between EIA, IEA and BP for C+C+NGL since January 2002 although the IEA data is currently >2 million bpd higher than the EIA and this reporting gap will one day need to be closed (Figure 2).

Figure 1 *Patches for missing JODI data taken from the EIA results in good agreement between global C+C production estimates for JODI and the EIA.*

Oil Watch posts are joint with Rembrandt Koppelaar.

Figure 2 *Comparison of C+C published by **JODI** and the **EIA** and of C+C+NGL as published by the EIA, **IEA** and **BP**.*

As part of our drive to restart Oil Watch Quarterly we have plotted hundreds of charts in recent weeks. Getting close to the data we began to recognise a large number of disparities between the various organisation's data leading to a crisis of confidence - are any of the data and the charts we are plotting meaningful? This drew us to the JODI database where the provenance of the data is known. National governments have been reporting oil production and oil products consumption data to JODI since January 2002 making it a powerful source of energy statistics. However, the incompleteness of the JODI production data has hindered its use in tracking global oil production trends.

47 countries report oil production data to JODI. However, the JODI production database suffers from 5 significant shortcomings:

1. 15 of these 47 countries have incomplete reporting records.
2. 15 further countries followed by the EIA do not report to JODI at all.
3. The EIA reports a further category of "other countries" for each continent which are an amalgamation of very small producers and these too are not included by JODI,
4. Canadian tar sands production is not included in the JODI C+C category.
5. Countries only began reporting NGL to JODI in January 2009 and these reports are very fragmented to the extent that JODI NGL reports are not currently useful at a global scale.

As described below, correcting the JODI C+C data for shortcomings 1 to 4 provides a close alignment with the global C+C data reported by the EIA - problem solved!

Alignment of JODI and EIA data for OECD countries

The alignment of JODI and EIA C+C data for most OECD countries is very good and is near perfect for the last 4 years. See for example data for the USA and Norway in Figures 3 and 4. This led us to believe that the EIA data could perhaps be used to patch the holes in the JODI production database.

Figure 3 *There is excellent agreement between JODI and EIA C+C production data for the USA. In fact for the last 4 years the agreement is exact suggesting that the EIA and JODI are using the same data reported by the US government.*

Figure 4 *There is also excellent agreement between JODI and EIA C+C production data for Norway and as a general rule this applies to all OECD countries.*

Incomplete records of 15 countries

15 countries reporting oil production data to JODI have incomplete records including some important producers like Kazakhstan (Figure 5), Iraq (Figure 6) and smaller producers like Oman (Figure 7). Other notable countries like Iran, Libya, Columbia and Romania have incomplete records. In order to try and make sense of the JODI data, these data gaps have been patched using data from the EIA. Incomplete records are the greatest source of disparity between JODI and EIA data and are weighted towards the beginning and end of the 10 year period since January 2002, approximately 5 million bpd at the beginning and 7 million bpd at the end of the reporting period. During 2008 the JODI reports were complete and the missing data patch is zero (Figure 1).

Figure 5 *The JODI record for Kazakhstan is incomplete and there is poor agreement between the JODI and EIA C+C production data. Data gaps such as those shown have been patched using EIA data to produce the corrected JODI global C+C chart (Figure 1). It is often, though not always the case that the EIA estimates are higher than JODI.*

Figure 6 *The JODI record for Iraq is incomplete but since Iraq began reporting in January 2007 there has been good agreement with the EIA data.*

Figure 7 *The JODI C+C production record for Oman is also incomplete but like Iraq, there is good agreement with the EIA for the periods where JODI reports exist.*

15 countries not reporting to JODI

There are 15 individual countries for which the EIA report data that do not report to JODI. These are mainly very small producers like Pakistan and Bangladesh but includes some more important new producers like Sudan and larger nations like Ukraine that does not have much production. The missing countries patch ranges between 1.5 and 2 million bpd (Figure 1).

Other countries category

The EIA also reports a category of "other countries" for each continent being an amalgamation of very small producers. This patch varies between 300 and 600, 000 bpd (Figure 1)

The curious case of Canada

While JODI C+C data for the vast majority of OECD countries is closely aligned with the equivalent EIA data (see above). Somewhat surprisingly this is not the case for Canada where the EIA estimates are considerably higher. Since January 2009, JODI have reported an additional category of "other" defined as *"Refinery feedstocks + additives/oxygenates + other hydrocarbons"* and adding this to the JODI C+C figure produces alignment with the EIA C+C. In Jan 2012, the other category = 937,174 bpd which matches exactly the synthetic crude production from tar sands reported by Statistics Canada and thus Canadian synthetic crude production needs to be added to the JODI C+C number. However, synthetic crude only represents about half of tar sands output with Crude Bitumen representing the rest at around 800,000 bpd. The only other country to have a substantial entry under the JODI *other* category is the USA and I suspect this may be linked to upgrading and refining Crude Bitumen but at present I am unsure how to handle this component - if anyone can advise...

Figure 8 *The EIA C+C production data for Canada is significantly higher than the JODI estimate. The disparity is due to synthetic crude production that is reported in the JODI other category. A patch for synthetic crude production has been applied since Jan 2002 (Figure 1). It is unclear at present how crude bitumen should be handled.*

Wild cards

While adjusting the JODI data for a variety of omissions has produced good alignment with the EIA (Figure 1) there are also a significant number of anomalies that seem to cancel each other out in the production stack. Angola, for example, shows good agreement up until 2008 when the two data sets begin to diverge (Figure 9). The EIA data for Algeria is way higher than the JODI data (Figure 10). As already mentioned there is a tendency for EIA data for non-OECD countries to be higher than JODI but this bias is cancelled by Venezuela where the EIA data comes in significantly lower (Figure 11). It would be interesting to hear from the EIA their views on the origins of these significant discrepancies. There are several more.

Finally, it is interesting to note that the Iranian authorities do not concur with the EIA view that their production is in decline under the weight of international sanctions (Figure 12).

Figure 9 *JODI - EIA C+C production comparison for Angola.*

Figure 10 *JODI - EIA C+C production comparison for Algeria.*

Figure 11 *JODI - EIA C+C production comparison for Venezuela.*

Figure 12 *JODI - EIA C+C production comparison for Iran. Note that the EIA view is that Iranian production is falling, the result of international sanctions whilst the Iranian authorities' data reported to JODI shows production stable / rising.*

Concluding thoughts

Whilst the gaps in the JODI production data are a frustrating inconvenience this venture is highly worthwhile providing a means of cross checking data published by other agencies whose independence may on occasions be questioned. In addition to production data JODI also gathers extensive data on oil products consumption that will be the subject of a future post. With natural gas becoming an ever more important part of the global energy mix, it would be wonderful to see JODI begin to start gathering natural gas statistics.