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King Abdullah Petroleum Studies and Research Center

OPEC Oil Production Data: The Role of Secondary Sources

Paul Mollet and Saleh Al Muhanna

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Key Points

- Secondary sources play a critical function in collating OPEC oil production data that is widely used by international oil markets and by the OPEC Secretariat itself.
- The methodology used by these data providers to collect oil production data varies little between organizations and includes a mix of confidential sources, government statistics, shipping and port data, and tanker tracking information.
- The robustness of data published by secondary sources varies by country and secondary source, with production from some OPEC countries such as Iran particularly opaque.
- Tanker tracking techniques using Automatic Identification System monitoring and satellite imagery are still in their infancy and do not provide sufficiently robust data to give an alternative to secondary sources.
- Although much of the data secondary sources collate is unverifiable, there are currently no alternative sources or methodologies that are more robust.

Executive Summary

OPEC oil production data is a key to understanding not just global energy balances but also the international oil market. Historically, most OPEC oil production figures are opaque as governments either consider them to be confidential and do not publish the data or publish numbers that many analysts consider to be unreliable. The OPEC Secretariat publishes monthly production data on the basis of estimates produced by 'secondary sources.' These include S&P Global Platts, Argus Media, Energy Intelligence Group, IHS-Markit, the Energy Information Administration (EIA) and the International Energy Agency (IEA).

Even though the OPEC Secretariat makes it clear that its data comes from such secondary sources, its production figures are often mistaken as primary data. For example, the widely-quoted annual BP Statistical Review of World Energy uses the OPEC Secretariat's production data, which are an average of the numbers published by secondary sources. Other reports and academic literature also cite OPEC production numbers published by the OPEC Secretariat, or those of the IEA and the EIA, as if they were based on primary sources.

Since all OPEC members have coastal borders and export almost all production by tankers, all secondary sources start by calculating exports, to which they add domestic consumption and factor-in stock changes as a way of getting to wellhead production. Secondary sources use a mix of data to establish oil production estimates that include port and shipping data; information supplied by tanker tracking agencies; informal national oil company contacts to identify wellhead production, field shutdowns, field start-ups, refinery throughputs; official data for power consumption, refinery and chemicals capacity; informal oil ministry contacts for wellhead production; and media reports for accidents, and shutdowns.

The robustness of oil production data published by secondary sources for any single country varies according to a range of factors, including the availability of shipping data such as loading schedules, the reliability and candidness of confidential sources canvassed, and the country's profile. None of the data is verifiable. Typically, media organizations such as Platts and Argus have the advantage of a network of well-placed correspondents and an inherent ability to secure information from confidential sources, while governmental and inter-governmental organizations such as the IEA and the EIA have the advantage of being official entities with privileged access.

While calculating seaborne oil exports is a relatively simple exercise, it is much harder to estimate domestic consumption and oil inventory changes. Secondary sources tend to assume refinery throughput is stable and simply monitor refinery shutdowns. The cases of Saudi Arabia and Iraq are even more complex: The Kingdom still burns a relatively high amount of crude for power generation, from 300,000 barrels per day (bbl/d) peaking at 650,000 bbl/d at the height of summer, while Iraq burns between 100,000 bbl/d and 200,000 bbl/d. Saudi Arabia publishes its crude burn via The Joint Organisations Data Initiative (JODI) with a two-month delay, so secondary sources are obliged to estimate the local crude burn using historical trends. The Iraqi oil ministry does not release any figures. Stock changes are even harder to quantify. Some OPEC countries report them to JODI, but a new generation of commercial satellite data providers are increasingly using complex algorithms to estimate the volume of oil in floating-lid storage tanks. This technology is still in its infancy, however.

The last decade has seen the emergence of a number of tanker-tracking and satellite data services that are providing 'alternative data' largely aimed at

the oil trading community, but which are also used by most of the secondary sources to complement traditional information sources. However, a multiplicity of factors contribute to the unreliability of tanker tracking, including tankers switching off their Automatic Identification System (AIS) transponders and unreliable data that is inputted manually, such as vessel draft and vague destinations.

Furthermore, AIS does not indicate volume, so commercial data providers typically assume tankers are carrying crude and attribute a standard volume according to tanker class. The cargo of smaller oil tankers is usually assumed to be crude oil, but some cargoes can be condensate. An added complication is that tankers regularly load from ports in different countries, making it even harder to establish the volume and origin of the crude oil.

Tanker tracking and satellite data are far from robust enough to provide an accurate picture of OPEC oil production. Even if the secondary sources might be flawed, there is no obvious alternative methodology to calculate OPEC oil production in the absence of verifiable primary data.

Introduction

One of the OPEC Secretariat's key tasks is to collate monthly oil production data on behalf of member countries, figures that OPEC subsequently publishes in its Monthly Oil Market Report (MOMR). Given the internal competition – and occasional disputes – between OPEC members, many members do not supply production data to the organization. Instead, the Secretariat publishes production data on the basis of estimates produced by 'secondary sources,' a phrase coined by OPEC. This is data for wellhead production, excluding any volumes from natural gas liquids or condensates. These sources are Platts, Argus, Energy Intelligence Group (EIG), IHS Markit, the Energy Information Administration (EIA) and the International Energy Agency (IEA). Other institutions that regularly publish monthly OPEC production data include inter alia Thomson Reuters, Bloomberg, the Middle East Economic Survey, and Petrologistics.

This paper aims to give an overview of the role of such reporting services and consultancies, widely known by the term 'secondary sources' and to investigate whether Professor Mabro's assessment is still valid.

Getting accurate global oil production data, especially OPEC oil production data, is essential in order to understand global energy balances and current oil prices. Historically, most OPEC oil production figures are opaque as governments consider them to be confidential and do not publish the data or publish numbers that many analysts consider to be unreliable. Furthermore, negotiations within OPEC on production quotas or ceilings give members an incentive to provide incorrect figures: too high if a member wants to claim a higher production quota or too low if it wants to hide over-production. In recent years, individual OPEC countries have reported oil production figures to the Joint Organisations Data Initiative (JODI) run by the International Energy Forum (IEF) Secretariat in Riyadh.

This data is delayed by one or two months and is consequently of limited use to analysts looking for a current oil market snapshot. Its reliability is also, in some cases, questioned by analysts for the reasons cited above.

Over two decades ago, in a commentary entitled "Transparency in Oil Markets and Other Myths" the late Robert Mabro wrote:

> *Two of the most persistent myths of oil markets are that: 1) the prices set for oil are efficient, which is to say, reflect the state of best knowledge about the market; and 2) oil production data published by the reporting services and consultancies accurately reflect the supply situation.*
>
> *In both cases, analysts are the victims of their own naïveté. Pricing of oil is anything but the product of 'efficient markets,' at least in the sense that we understand that term as applied to securities markets in a highly regulated environment such as the United States. Nor is the quantity of oil produced as readily ascertainable a sum as many would think. Faith is placed all too readily in the numbers reported by the services, with little or no critical analysis of the basis or implications of those numbers. (Mabro 2001).*

Secondary source data is often mistaken as primary data. While the OPEC MOMR makes it clear that its numbers are based on secondary sources, OPEC's figures are often identified as a primary source. For example, the annual BP Statistical Review of World Energy uses data from the OPEC Secretariat for oil production numbers for member countries. The BP Statistical Review, published by the oil company but written by an independent team at Herriot Watt University in Edinburgh, Scotland, is arguably one of the world's

key reference publications for global energy statistics. It generally collates its data from public sources rather than using propriety data (Shaffer 2017).

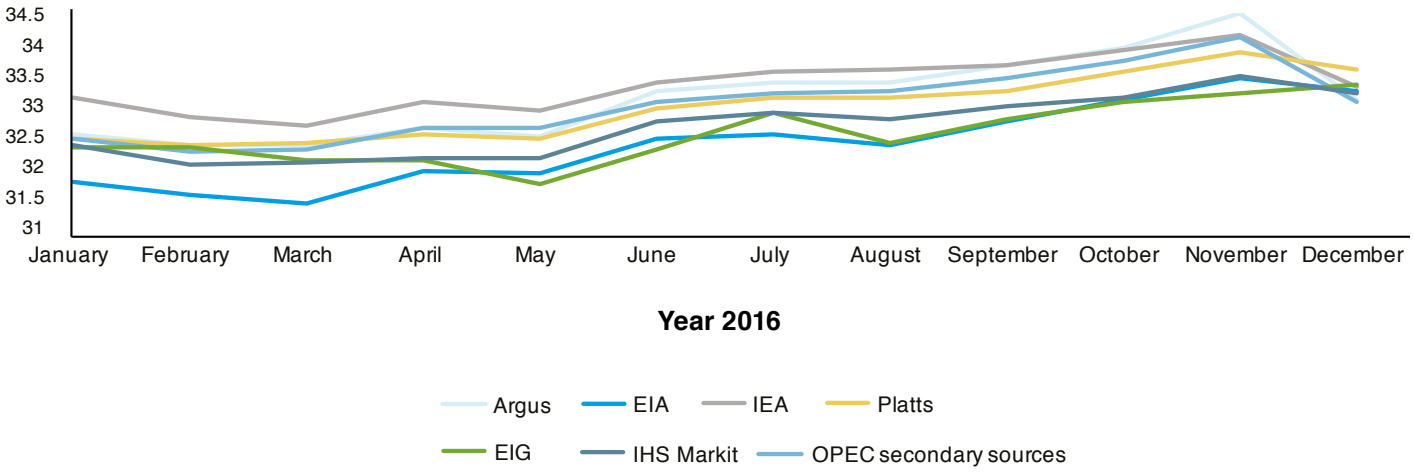
OPEC end-of-month production data is clearly a critical data set, necessary for an understanding of global energy balances and the current state of the global oil market, allowing analysts to establish whether the oil market is in balance. Indeed, monthly production data provided by the secondary sources is a major driver of short-term oil prices, as market participants respond to indications of a possible glut or shortage. OPEC monthly production data are also often used as a variable in long-term oil price forecasting models.

There has been little research to date into the methodology used by the secondary sources when collecting data that is inherently opaque.

Even though such data acts as a major driver of oil prices, secondary sources have as yet not come under regulatory review. Two of these sources, Platts and Argus, are oil price reporting agencies (PRAs) and are subject to the International Organization of Securities Commission's (IOSCO's) Principles for Oil Price Reporting Agencies that cover price discovery methodology. However, the Principles do not cover oil production data produced by these agencies, nor is the methodology used to produce the data subject to any external review.

As Figure 1 shows, monthly OPEC oil production estimates published by secondary sources can vary by as much as 1.5 million bbl/d, a material amount that could explain price movements in the market. A key unanswered question is whether the methodology used by the secondary sources holds any clues that explain the wide variation in published data.

Figure 1. Total OPEC production 2016 (MMbb/d).



Source: KAPSARC.

Introduction

To date, the academic literature has ignored the ad hoc nature of secondary source data while using such data as if it were primary data. Indeed, there has never been a paper written on the methodology used by the secondary sources. This paper is based on interviews and information submitted by the secondary sources and comes at a time when technology, notably the use of satellites to track ships and calculate storage, threatens to undermine some traditional elements of human intelligence used by secondary sources. This paper will conclude by evaluating the current state-of-play of satellite technology and whether it is likely to prove to be a disruptive model.

Basic Principles Used to Estimate OPEC Oil Production

All OPEC members have coastal borders and tankers export almost all production. Historically, secondary sources have used a mix of their own sources to establish oil production estimates. Since wellhead data from national oil companies (NOCs) is closely-guarded proprietary information (sometimes released to the secondary sources), the fundamental principle has been to calculate seaborne exports and to add domestic consumption while factoring in inventory changes. Typical sources include:

- Port and shipping contacts to identify the frequency and size of export cargoes.
- Information supplied by tanker tracking agencies.
- Informal NOC contacts to identify wellhead production (rarely), field shutdowns, field startups, and refinery throughputs.
- Official data for power consumption, refinery and chemicals capacity.
- Informal ministry contacts for wellhead production.
- Media reports for accidents and shutdowns.

Secondary sources also consult data published by JODI, even though it has a two-month time lag. The self-declared nature of the data has meant that some analysts have questioned its reliability. However, a growing number of secondary sources are trusting data supplied by some countries, notably Saudi Arabia. However, JODI is not the primary source of reference for OPEC oil production data.

Methodology Used by the OPEC Secretariat's Secondary Sources

When selecting six organizations as the secondary sources for oil production data, OPEC was careful to maintain a balance between the type of entity it would use. The secondary sources comprise two PRAs (Platts and Argus), one news agency (Energy Intelligence), one consultant (IHS Markit) and two energy agencies (IEA and EIA). Of these, only the PRAs that have come under regulatory action during the IOSCO process have published methodology documents.

Platts, officially known as S&P Global Platts, has been publishing monthly OPEC production data since 1988. The company describes its data set as a "survey" and the numbers as an estimate, obtained "through a review of propriety shipping data, news reportage and interviews with knowledgeable sources." (S&P Global Platts 2018) According to the company, the data reviewed include:

- Loading programs.
- Export statistics.
- Tanker tracking.
- Interviews with NOC and ministry officials, analysts at international agencies, think tanks, consultancies, banks and traders.

Loading programs and export data are verified against tanker-tracking data, as are statements from oil companies and oil ministries. Oil traders and analysts focus on intelligence gathering. As a news agency, Platts can draw on a number of regional bureaus and freelance journalists to help with its survey.

London-based **Argus Media** uses a variety of means to arrive at what it describes as an "estimate" of production that includes:

- Monitoring exports through tracking crude tankers.
- Checking reports from upstream companies and governmental or quasi-governmental agencies.
- Gathering information on production from other sources that is as robust and verifiable as possible.

Argus says that it seeks "independent verification of the definition to individual streams. In the absence of clarity, Argus will make intelligent judgments in respect of assessed production. These may vary from country to country, depending on the availability of information and Argus' ability to independently verify it." (Argus Media 2018)

Argus uses tanker tracking data to cross-check and validate data gleaned from port and industry sources, but it says that estimating domestic demand is a challenge in the absence of immediately-available data. Its oil production intelligence gathering system is supported by a global network of offices and independent journalists.

The IEA's monthly oil production data, published in the monthly Oil Market Report, is highly influential because it feeds into the OPEC data as a 'secondary source' and is also used extensively by energy analysts and researchers. It uses a similar methodology to the PRAs from where its analysts are typically recruited. The agency does not publish a document on its methodology, but in its glossary under OPEC Oil Production it states:

"Estimates of OPEC crude production are based on information from a wide range of sources with tanker tracking information being particularly useful. Production is generally, but not exclusively, taken as exports plus local consumption of crude oil and hence does not generally take into account any changes in crude oil stock levels within the country." (IEA 2018)

Similarly, the **EIA** consults a range of industry and government sources and uses tanker tracking information services to complement human intelligence. As an official United States (U.S.) government agency, the EIA team can consult the State Department's embassy network, though diplomats do not typically follow oil production on a monthly basis. The agency concedes that it has trouble finding reliable data from countries with which the United States has a difficult relationship, such as Iran and Venezuela. As with other secondary sources, the EIA subscribes to tanker-tracking data services but prefers to rely on government and company sources. EIA analysts also talk to other secondary sources prior to publishing their estimates.

The New York-based Energy Intelligence Group's **Petroleum Intelligence Weekly** publishes monthly OPEC oil production data using information collected via its network of correspondents. It relies on a mix of primary sources and shipping data, including loading schedules. Primary sources are typically oil ministry, NOC, international joint venture or port officials who provide production data or guidance such as 'a bit more than last month.' Data on Saudi Arabia submitted to JODI in previous months is generally accepted at face value and is used as a benchmark when setting end-month oil production estimates.

Like other secondary sources, **IHS Markit** collates its data starting with exports and, in the case of Saudi Arabia, adds refinery runs and crude burn estimates. The wide range of field-level data offered by the consulting company does not include an insight into real production at any one time. Instead, the company relies on a similar approach used by other companies (shipping data and a mix of oil industry and government sources). The company does highlight some countries, however, such as Venezuela, where it has particularly good sources on the ground. IHS Markit analysts typically speak to several organizations that collate monthly production estimates, both official OPEC secondary sources and other news agencies that also publish monthly production numbers.

Two clear observations arise from this review of methodologies. The first is that all the secondary sources follow essentially the same approach but use their respective institutional strengths to achieve the best results. Media companies use their journalistic skills and network of local correspondents to gather local intelligence, while governmental or inter-governmental agencies such as the IEA and the EIA leverage their official status and government networks to gain an edge in data quality. By employing former journalists to collect OPEC production data, the IEA benefits from both. The second observation is that many of the secondary sources consult each other before coming up with their numbers, raising the risk of unintended convergence or falling victim to anchoring bias. They can also each see many of the other estimates once they have been published, which can trigger revisions or influence their estimates for future months. So, rather than being a set of discrete estimates, they all exist within something of an echo chamber.

Data Challenges

Data challenge 1: regional variations

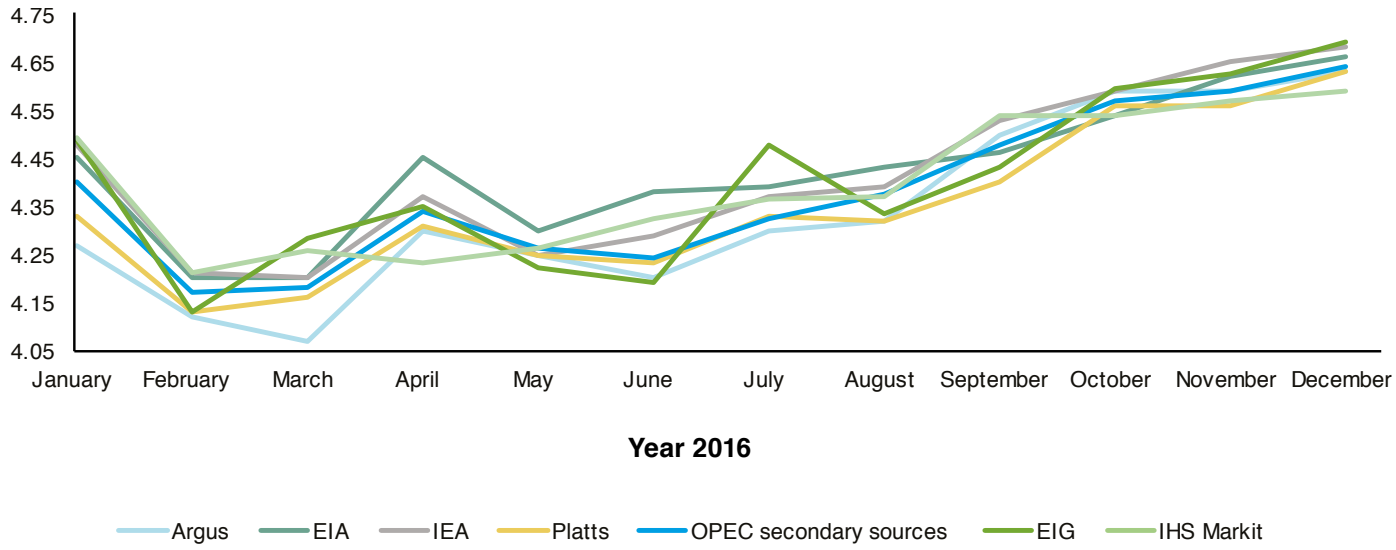
The robustness of oil production data published by secondary sources for any single country varies according to a range of factors. These factors include the availability of shipping data, such as loading schedules, the reliability and candidness of confidential sources canvassed by the secondary sources, and the profile of the country. The journalistic approach followed by three of the secondary sources means that greater efforts are made to identify production in newsworthy countries. Platts, Argus and EIG stress their respective strengths in estimating Iraqi, Venezuelan and Libyan crude oil production, all countries of geopolitical interest. Inversely, relatively quiet countries such as Qatar are usually shown to have flat oil production, with secondary sources failing to pick up occasional declines caused by production shutdowns. Iran might be newsworthy but is largely closed to Western agencies, including the media, making it hard to report data. Iran's loading schedules and shipping data are tightly controlled, and officials do not speak to the media. Furthermore, Iranian tankers often do not switch on their Automatic Identification System (AIS) and, when they do, sometimes the signals do not get picked up due to the lack of receiving stations on the Iranian side of the Gulf. In contrast, many of the secondary sources believe that their data on Iraq is reliable despite the complications caused by the Kurdish control of some oilfields and its regional exports by truck. Port data from Ceyhan and Basra is generally accepted as robust but, while the Iraq oil ministry claims transparency in its data, some experts have questioned its reliability. For example, the oil ministry has reported production flat at 4.36 million bbl/d for every month since September 2017 (with only a 2,000 bbl/d fluctuation in December 2017). In countries such as Nigeria, Angola, Libya and Algeria, where the joint venture production model prevails, secondary sources claim confidential sources in the foreign entities.

Data challenge 2: domestic consumption and stock changes

When calculating a country's oil production most secondary sources take oil exports as their starting point, adding domestic consumption and factoring in the effect of any noticeable change in inventory levels (see Figures 2-5). For most OPEC countries, domestic crude oil consumption comes down to oil delivered to local refineries. Typically, refinery throughput is relatively stable; secondary sources simply have to monitor refinery shutdowns, whether due to maintenance or accidents. The case of Saudi Arabia is more complex because the Kingdom still burns from 300,000 bbl/d in periods of low demand to 650,000 bbl/d at the height of summer, a relatively high amount of crude for power generation. JODI publishes exact data with a two-month delay, so secondary sources are obliged to estimate the local crude burn using historical trends. Iraq also burns between 100,000-200,000 bbl/d of crude to generate power, but its oil ministry does not release the figures to JODI.

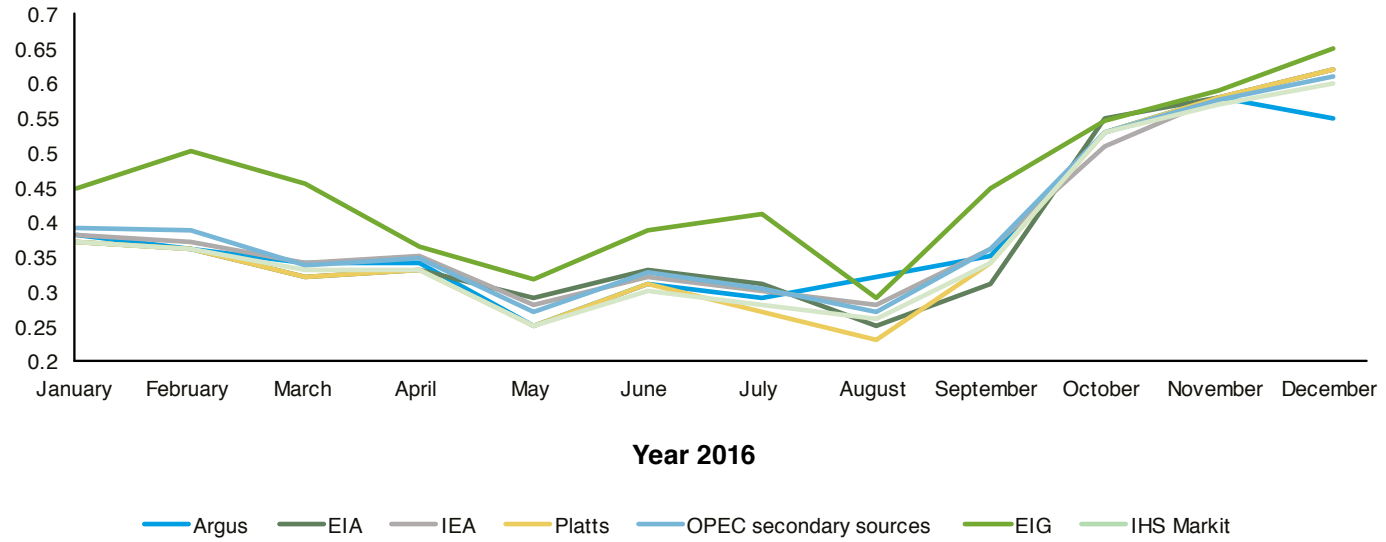
Stock changes are also hard to quantify. These are reported to JODI, but a new generation of commercial satellite data providers (that include many of the tanker tracking companies) are increasingly using complex algorithms to estimate the volume of oil in floating-lid storage tanks.

Figure 2. Iraqi oil production (MMbb/d).



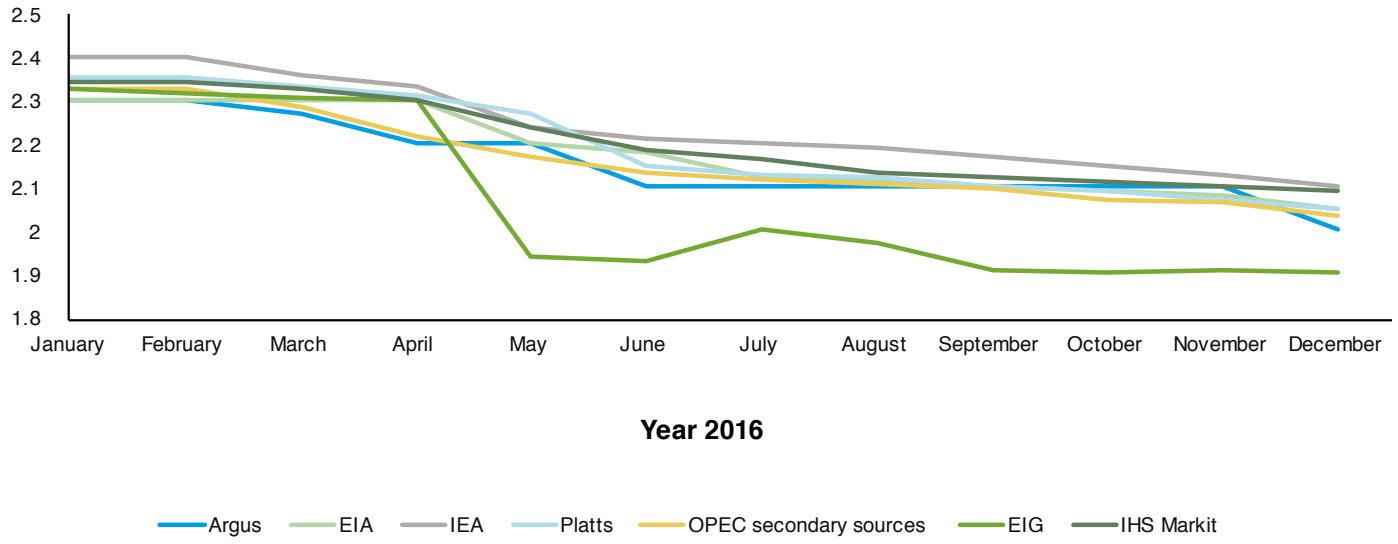
Source: KAPSARC.

Figure 3. Libyan oil production (MMbb/d).



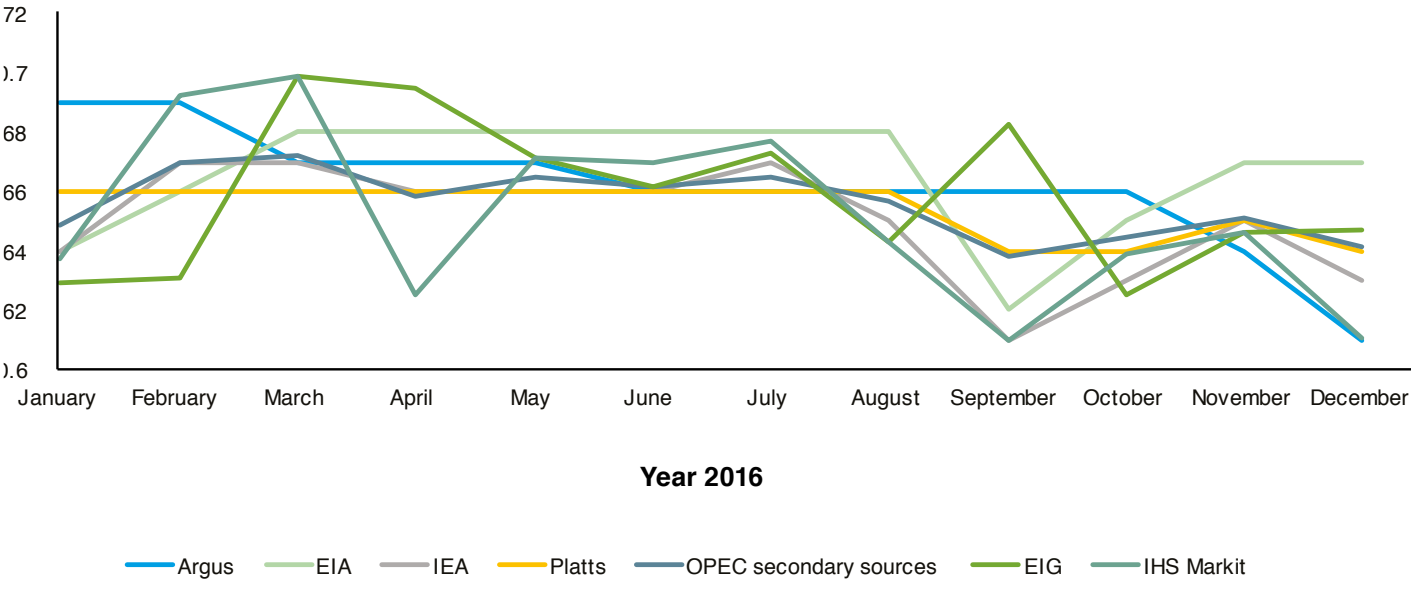
Source: KAPSARC.

Figure 4. Venezuelan oil production (MMbb/d).



Source: KAPSARC.

Figure 5. Qatari oil production (MMbb/d.



Source: KAPSARC.

Data challenge 3: crude oil definitions matter

When establishing OPEC crude oil production, defining what is crude – and what is not – is important within the context of internal OPEC discussions. This is because the organization does not count condensates as crude.

The U.S. Energy Information Administration defines crude oil as:

> *A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Depending upon the characteristics of the crude stream, it may also include: Small amounts of hydrocarbons that exist in gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casinghead) gas in lease separators and are subsequently commingled with the crude stream without being separately measured. Lease condensate recovered as a liquid from natural gas wells in lease or field separation facilities and later mixed into the crude stream is also included; Small amounts of nonhydrocarbons produced with the oil, such as sulfur and various metals; Drip gases, and liquid hydrocarbons produced from tar sands, gilsonite, and oil shale. Liquids produced at natural gas processing plants are excluded. Crude oil is refined to produce a wide array of petroleum products, including heating oils; gasoline, diesel and jet fuels; lubricants; asphalt; ethane, propane, and butane; and many other products used for their energy or chemical content. (EIA 2018)*

However, the inclusion of condensate, a low- density, high-API gravity liquid hydrocarbon in the EIA definition, is a contested issue because OPEC does not count condensates in its oil production data (EIA 2016). This raises two problems when calculating OPEC oil production.

The first is that some fields produce high-API gravity liquid hydrocarbons that could be defined either as ultra- light crude or as condensate. Two large fields in Nigeria, Agbami and Akpo, have such resources. From 2016, the IEA started counting output from the two fields as condensate. However, another secondary source, EIG, does include production from the field as crude oil in its monthly Nigeria data.

The second issue is that many OPEC producers blend condensate produced at other fields (it is usually a by-product of natural gas production) into their crude oil streams, which means that secondary source calculation of tanker exports can include condensate. There is a similar issue in Venezuela where extra-heavy crude produced from the Orinoco basin is blended with lighter diluents, usually imported naphtha, which is then exported.

The Joint Organisations Data Initiative (JODI)

The methodology used by secondary sources allows for the rapid dissemination of estimated OPEC production data, typically by the end of the first week of the subsequent month. Some news agencies such as Reuters and Bloomberg (not an official OPEC secondary source) publish numbers on the first day of the new month, sometimes on the last day of the month in question. Most OPEC countries provide official data to JODI, managed by the International Energy Forum in Riyadh, Saudi Arabia (see Figure 6).

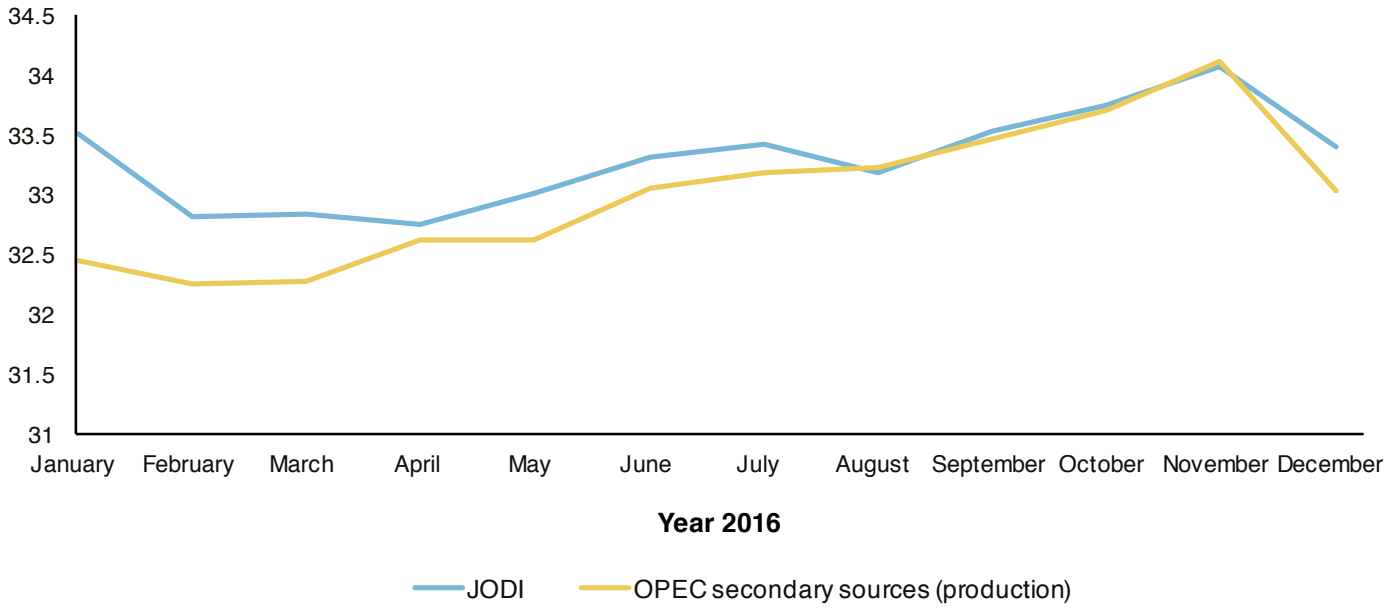
JODI was established by six international organizations: APEC, Eurostat, the IEA, the Latin American Energy Organization, OPEC and the United Nations Statistics Division 1. It launched the Joint Oil Data Exercise in April 2001. JODI collects monthly oil statistics from each organization's member countries through a harmonized questionnaire on 42 key oil data points. Data is typically available with a two-month time lag depending on the country.

JODI concedes that it is fully aware of the limitations of the database. However, timeliness, coverage and reliability are already at reasonable levels for many countries – especially for the top 30 producers and consumers. Secondary sources tend to take a cautious approach to JODI data due to its self-declared and unverifiable nature. However, Saudi Arabia's oil production and inventory data are increasingly being accepted at face value (see Figure 7). Given the delay in publishing this data, secondary sources use the JODI data as a benchmark and to validate their own data.

Other data providers

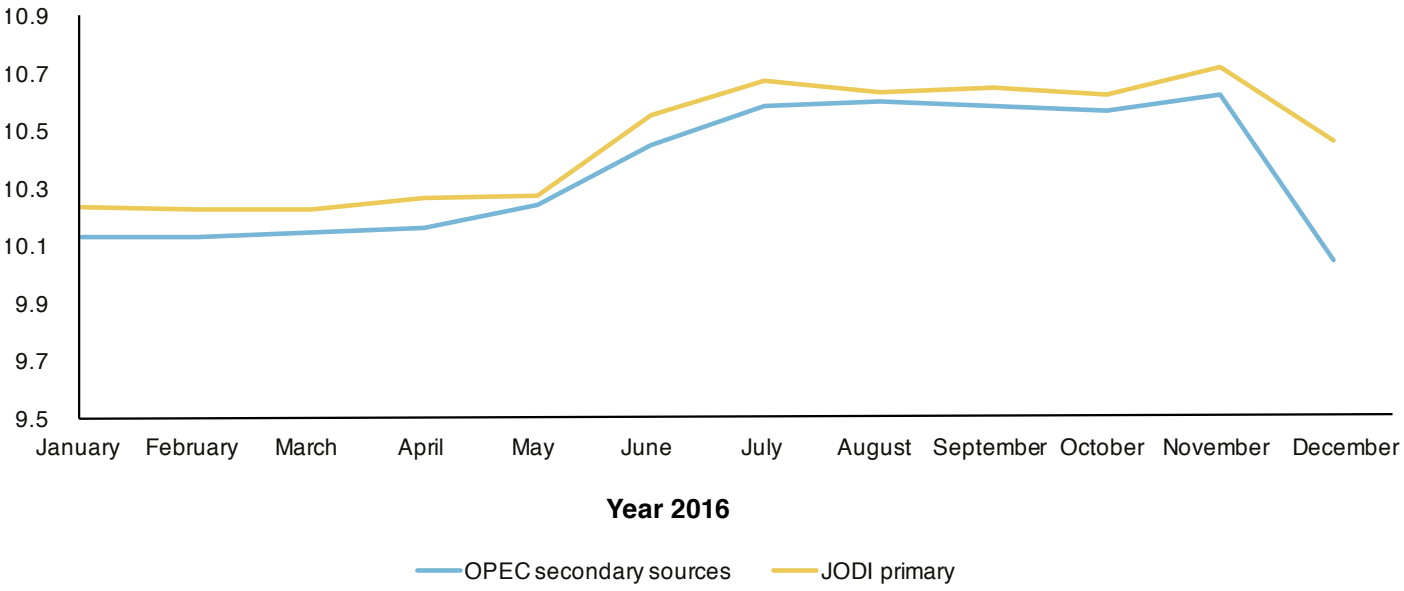
A number of news agencies and consultancies produce month-end estimates of OPEC oil production, in addition to the six official OPEC secondary sources. Newswire services Bloomberg and Reuters publish their data, while Petrologistics, the original pioneer in this field, and Energy

Figure 6. Total OPEC oil production (MMbb/d).



Source: KAPSARC.

Figure 7. Saudi Arabian oil production (MMbb/d).



Source: KAPSARC.

Aspects, a leading London-based consultancy, make their data available to clients only (see Figure 8).

Tanker tracking: an uncertain science

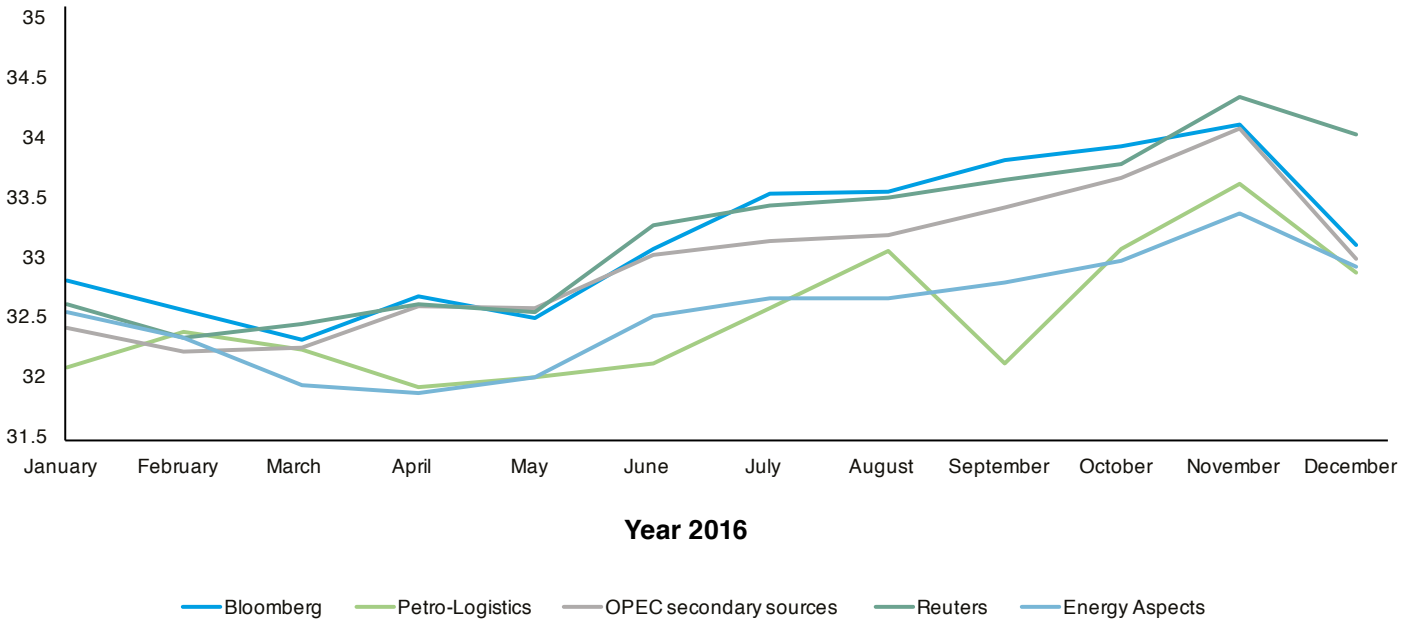
The last decade has seen the emergence of a number of tanker-tracking and satellite data services that provide 'alternative data' aimed largely at the oil trading community, but which are also used by most of the secondary sources to complement traditional information sources. Typically, such companies such as ClipperData publish estimates for crude oil exports (see Figure 9).

The International Maritime Organization's International Convention for the Safety of Life at Sea requires AIS transponders to be fitted aboard international voyaging ships with 300 or more gross tonnage (IMO 2018). The regulation requires that AIS shall:

- Provide information – including the ship's identity, type, position, course, speed, navigational status and other safety-related information – automatically to appropriately equipped shore stations, other ships and aircrafts.
- Receive automatically such information from similarly fitted ships.
- Exchange data with shore-based facilities.

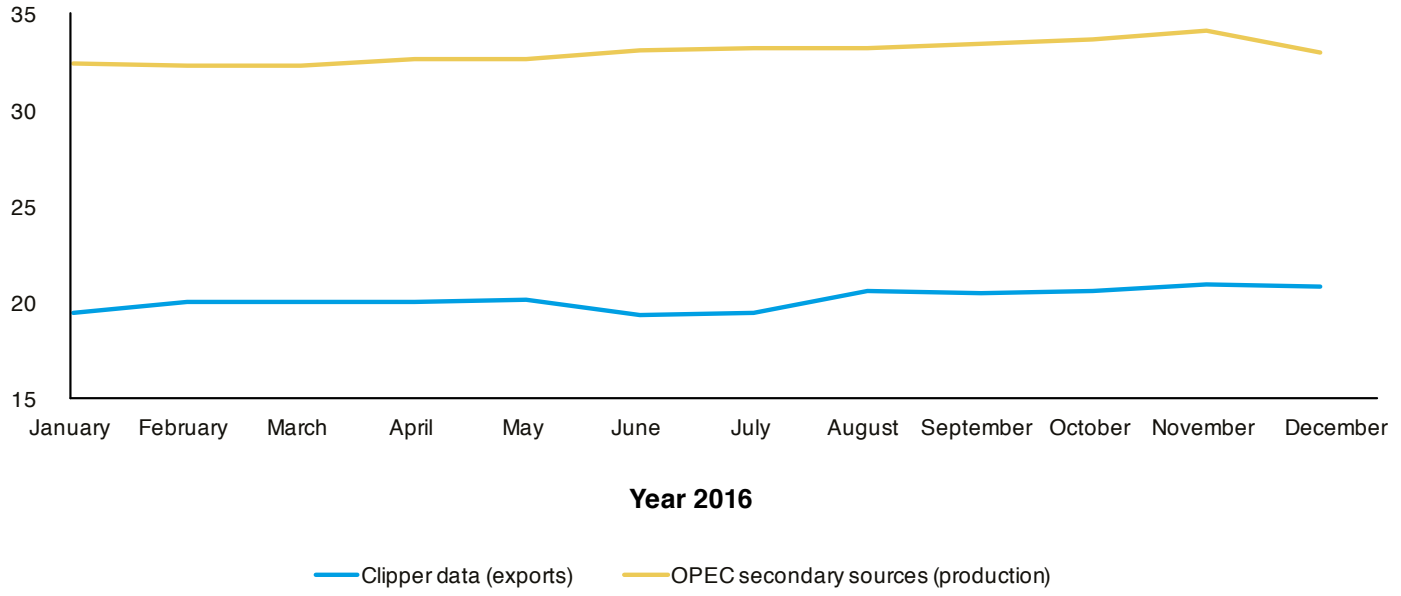
Vessel captains can also voluntarily input additional data such as the ship's draft, allowing algorithms to calculate the exact load. Specialist information providers make AIS data commercially available

Figure 8. Total OPEC oil production (MMbb/d).



Source: Energy Aspects.

Figure 9. OPEC oil production and exports (MMbb/d).



Source: KAPSARC.

to a wide range of oil market participants. Most secondary sources use tanker-tracking data to validate their data (S&P has its own), but at present coverage from OPEC countries is not considered to be sufficiently robust to be a reliable data tool on its own.

Typical issues that contribute to unreliability include:

- Tankers switching off their AIS transponders (for instance when avoiding sanctions) and dark zones where there is no coverage. This affects tankers leaving Iran that generally rely on coverage from receiving stations on the Arab side.
- Unreliable manually entered data – analysts report the draft as unchanged after the vessel is loaded/unloaded.
- The destination is often not mentioned or typically put as a route point, such as Suez.

Furthermore, AIS does not indicate volume, so commercial data providers typically assume tankers are carrying crude and attribute a standard volume according to the class of tanker: 2 million barrels for a very large crude carrier, 1 million for a Suezmax and 650,000 or 600,000 barrels for an Aframax class of tanker. The cargo of such tankers is usually assumed to be crude oil, but some cargoes can be condensate. Qatar and Iran are major condensate producers known to use smaller oil tankers to export volumes of condensate. An added complication is that tankers regularly load from ports in different countries, making it even harder to establish the volume and origin of the crude oil.

Satellite data increasingly complements AIS data. Such data can be useful in estimating inventory levels. Satellite data providers use algorithms to measure the amount of oil in floating lid tanks (where the top of the tank rises and falls according to the amount of oil it contains) by measuring the shadow cast inside the tank. However, cloud cover can delay the collection of data and not all tanks have floating lids. Furthermore, satellite imagery cannot capture underground storage.

While AIS and satellite data can be valuable to oil traders, it is not sufficiently robust to be an accurate indicator of crude oil export volumes from individual countries. Secondary sources tend to use such data as part of a sense check, along with other data sources.

Conclusion

The six institutions chosen by the OPEC Secretariat play a key role in contributing to a critical data set in the global energy market. All of them use similar methodologies based primarily on intelligence gathering complemented by tanker-tracking data. Information gathered from each of the secondary sources on their methodology through interviews provides no evidence of a material difference that could explain data variations. On a country by country basis, a single secondary source might provide more accurate data due to more reliable sources in a particular country, but this is impossible to verify. Despite the risk that these methodologies might be flawed, and in the absence of verifiable primary data, there is no obvious alternative methodology to calculate OPEC oil production.

Information on exports and storage provided by tanker tracking and satellite data providers, while potentially useful to oil traders as an indication of crude oil flows to specific markets, remains problematic and insufficiently robust to provide an alternative methodology. However, this is an emerging science and the data from these sources is likely to become more robust as technology improves.

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Notes

About the Authors

Paul Mollet

Paul is a research fellow in the Policy and Decision Sciences program. He is an analyst with over 25 years of experience covering international oil and energy markets. Paul has attended numerous OPEC meetings and written extensively about the oil industry in publications such as Platts Oilgram News, Argus Global Markets, and the Petroleum Economist.

Saleh Al Muhanna

Saleh is a senior research analyst in the Policy and Decision Science program with interests in geopolitical research, international agreements and international trade. He holds a master's degree in international commerce and policy from George Mason University and a B.S. degree in economics from the Pennsylvania State University.

About the Project

One of KAPSARC's core tasks is to provide insights into the functioning of global oil markets. This stand-alone study seeks to understand how independent organizations collate OPEC oil production estimates and aims to clarify a key data point in global energy balances.

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