

Saudi Aramco Privatization in Perspective: Financial Analysis and Future Implications

Ruud Weijermars*, Jonathan Moeller

Harold Vance Department of Petroleum Engineering, Texas A&M University, 3116 TAMU College Station, TX 77843-3116, USA

*Corresponding author: R.Weijermars@TAMU.edu

Received May 26, 2020; Revised June 27, 2020; Accepted July 06, 2020

Abstract This study analyzes a prime example of corporate restructuring and financial engineering through a detailed analysis of Saudi Aramco's bond and equity financing program which started April 1, 2019. The key steps involved in the ongoing privatization of Aramco, the world's largest integrated national oil company, via additional major initial public offerings (IPO) in 2021, are explained - including the 2020 acquisition of Saudi Basic Industries Corporation (SABIC). The coupled corporate restructurings of both SABIC and Aramco are visualized in a number of concise diagrams which highlight the impending changes in the appropriation of capital inflows and outflows. The 2020 SABIC acquisition, and 2021 IPO will cause major changes in Aramco's corporate equity and debt financing, which will be reflected in its financial statements (balance sheet, cash flow account and income statement). We explain what will be the associated accounting shifts and make forward projections for Aramco's financial performance over the next decade, based on certain assumptions of market development and likely debt and equity financing scenarios. Cash flows generated by Aramco for the Saudi Government, before and after the corporate restructuring, are also analyzed in some detail. While the current focus of Aramco's privatization is on short-term value creation, we argue that the company is also poised for a new global leadership role. The potential impact on the global energy supply system is highlighted, including possible future developments in Aramco's role as the global oil swing supplier.

Keywords: cash flow analysis, oil firm privatization, corporate restructuring, debt and equity financing, Aramco

Cite This Article: Ruud Weijermars, and Jonathan Moeller, "Saudi Aramco Privatization in Perspective: Financial Analysis and Future Implications." *Journal of Finance and Economics*, vol. 8, no. 4 (2020): 161-170. doi: 10.12691/jfe-8-4-2.

1. Introduction

This study analyzes the pivotal role occupied by Saudi Aramco as the world's largest integrated oil and gas company, with a net income greater than the combined net income of ten of the most profitable oil companies in the world (Figure 1a). Aramco, fully state-owned until 2019 when a minor IPO was successfully completed, is planned for further privatization over the next few years. Aramco's stepwise privatization will dwarf prior IPOs, even when only 5 percent portion of the company is to be initially floated (Figure 1b).

The corporate performance of Saudi Aramco and its revenue sharing with the Saudi government has not been previously analyzed, which is why our study is merited. Although Saudi Aramco produces approximately 10 percent of the global oil supply, revenues generated by Aramco for the Saudi Government were not known, until April 2019, when Aramco released its first official financial statements for the three fiscal years 2016, 2017, and 2018. Our detailed analysis of these financial statements clearly shows that Aramco has historically provided the Saudi Government with considerable cash flow values. The

monetary proceeds to the Saudi Government in recent years were first specified in the Base Prospectus, released to selected global investors on April 1, 2019, in preparation for its future global bond issues in various denominations and tranches (Euro, Renminbi, etc.).

Entitlement payments from Aramco (Table 1) (and other income sources) provide funds to the Saudi Government annual budget, with any surplus funds placed in the Public Investment Fund (PIF). The purpose of PIF is to provide a source of future funds as well as sovereign wealth growth by continued investment in the Kingdom's global investments and domestic diversification projects [1]. The cash flow values due to the Saudi Government are split out in Aramco's financial accounts for 2017 and 2018 into three major revenue streams: oil sale royalties, shareholder dividends and proceeds from corporate income tax (Table 1).

Table 1. Saudi Aramco payments to the Saudi Government in billion USD [2]

	2017	2018
Royalties	37.6	56.9
Dividends	50.1	58.0
Income tax	46.1	48.0
Total	133.8	163.0

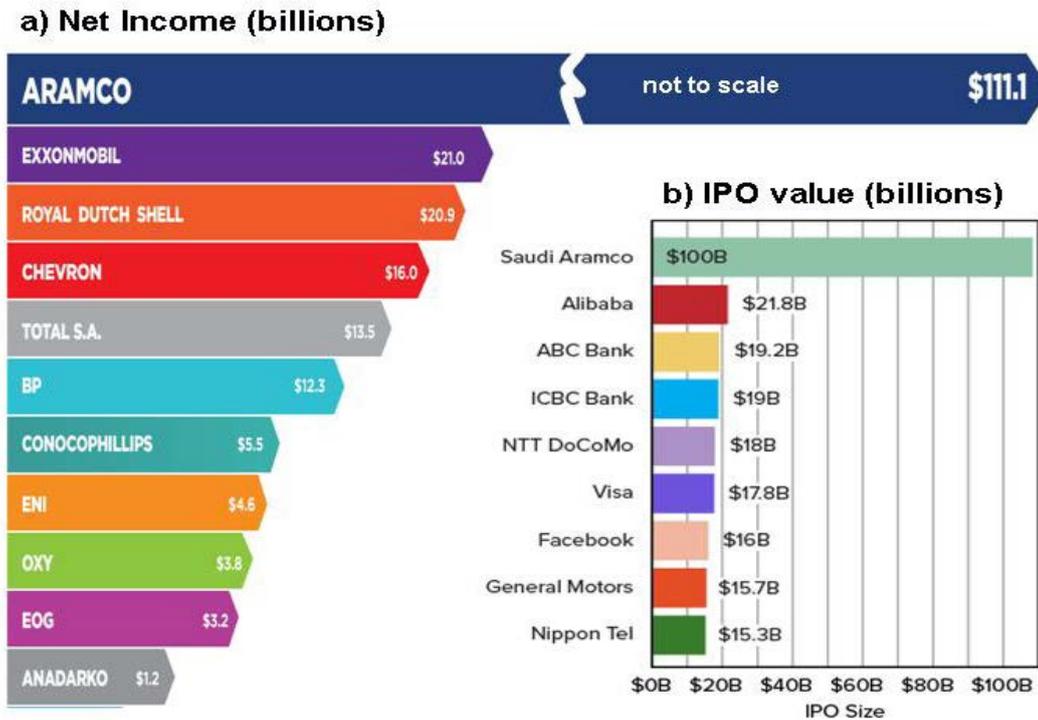


Figure 1. (a) Saudi Aramco 2019 net income as compared to 10 selected petroleum companies. (b) Aramco 5% IPO value based on \$2 trillion valuation versus the next biggest historical IPO values (source: Investopedia)

Saudi Aramco, via its production leverage on the global oil market, has been instrumental in pushing US shale oil producers toward marginal cost of supply [3]. Although the financial performance of oil majors [4,5], independents [6], and shale well profitability [7,8,9,10,11] have been studied in considerable detail, little public insight existed into the liquidity of Saudi Aramco. We argue that the progressive privatization of Saudi Aramco will likely affect the future development and direction of the global energy supply system. The privatization of Aramco was first announced in 2016 with the IPO planned for 2018, then postponed to 2021, but subsequently fast-tracked with a limited IPO of 2 percent on the Tadawul (Saudi's local stock-market) that was completed before the end of 2019. The analysis in this paper is based on an assumed cumulative IPO of 5 percent of Aramco in 2021. While the actual IPO timing and details may differ, the analyses in this paper remain valid, with lessons relevant for other IPOs and corporate restructuring programs.

2. Privatization Steps

Saudi Aramco has been operating as the national oil company of Saudi Arabia since 1976. Nationalization occurred gradually in the 1970s, when the four US parent companies (Standard Oil of California, Texaco, Exxon, and Mobil) conceded their Aramco shares to the Saudi Government. The parent companies effectively transferred ownership to the Saudi Government in a stepwise reduction of their Aramco venture partnership which had begun in the 1930s. The companies did so because they were made whole for the lost asset values via tax breaks granted to them by the US Government, in an effort to maintain geopolitical control in the Middle East region. While the Saudi Government secured 100 percent

ownership of Aramco in 1976, nationalization was not formalized until 1988, when Aramco changed its name by royal decree to Saudi Arabian Oil Company.

2.1. Effect on Aramco of 2020 SABIC Acquisition

As per the first public announcements of April 1, 2019, Aramco issued tradable bonds as a first step toward privatization of the company. The minimum bond denomination was 100,000 Euro, with a stated minimum investment threshold of 200,000 Euro. The aim of the 2019 bond issues program and the progressive path to further 2021 share initial public offerings (IPO) was to sustain company operations and avail continued cash for capital investment projects. In Aramco's IPOs, there is the added dimension of company privatization and the aspect of changes in corporate capitalization. The income generation for the Saudi Arabian government will also be shifted by the financial re-engineering of its national oil company.

The key steps toward privatization can be effectively illustrated by making use of Aramco's historic financial performance data (2016-2018), as a baseline to prepare financial and operational performance projections from 2019 forward. The corporate financial statements provided in the Aramco prospectus show how much cash was generated in field operations in the recent past. Plausible assumptions can be inferred from the historic data about future production output, oil price scenarios, financing activities, dividends to be paid out to shareholders and so on, to prepare financial and operational performance projections for the coming decade (2019-2030), assuming certain trends.

The road toward privatization follows several logical steps to probe international financial market's appetite

for the investment opportunities offered by Aramco. Firstly, \$12 billion in corporate bonds was issued in April 2019 (and possibly again in the future), which will help to establish a global source of *debt financing* for Aramco. The interest in Aramco bonds was record-breaking, with over \$100 billion in demand. Secondly, the acquisition of SABIC in 2020 will increase the operational integration of Aramco, while also monetizing government capital locked up in SABIC to the benefit of PIF. Thirdly, the progressive IPO towards 2021 aims to establish a global source of *equity financing* for Aramco.

2.2. Effect on Aramco of 2020 SABIC Acquisition

Aramco issued \$12 billion in bonds in April 2019 on the London Stock Exchange ahead of the 2020 SABIC acquisition. While considerably less than the \$69.1 billion purchase price for SABIC, Aramco management previously stated that cash from operations could be used as well. To provide transparency to the global financial markets, the company issued a so-called - “Confidential” - Base Prospectus (2019) for selected global investors on April 1 (2019) ahead of the bond issues.

The prospectus highlighted some key facts related to the bond issues and anticipated IPO of Saudi Aramco:

- Saudi Arabia’s Sovereign Credit Rating is A1 (stable, Moody’s)
- Saudi Aramco’s Corporate Credit Rating is A1 (Moody’s) and A+ (Fitch)
- Saudi Aramco’s 2018 return on average capital employed (ROACE) is 41 percent (for comparison, the five oil majors have an average 2018 ROACE of a mere 8 percent).

First, a clear understanding is needed of the various ownership structures in 2018, what has changed in 2019 and 2020 due to the SABIC deal, and what will change in 2021 due to the future progression of Aramco’s IPO. To evaluate the effect of the SABIC acquisition on Aramco’s business, diagrams were prepared by the authors (Figure 2 - Figure 5) to illustrate the corporate restructuring over the 2018-2021 period and the value transfers that will result from the various deals.

Figure 2 shows the 2018 ownership structure in which the Saudi Government held 100 percent ownership of both Aramco and the Public Investment Fund of Saudi Arabia (PIF), which act as respectively its cash source and cash buffer entities. SABIC is held for 30 percent by private investors and 70 percent is owned by PIF. The Saudi government receives proceeds from the taxation of corporate income by SABIC, as well as having access to SABIC dividends collected by PIF. All of Aramco’s proceeds (royalties, dividends and income taxes) were directly collected by the Ministry of Energy (formerly the Ministry of Petroleum and Minerals) for the benefit of the Saudi Government’s Annual Budget, with excess cash stored in PIF for further sovereign wealth fund investments.

Figure 3 shows how the ownership structure was to be modified by the 2019 bond issuance and the 2020 acquisition of PIF’s 70 percent share in SABIC

by Aramco. Aramco used the cash proceeds from the 2019 global bond issues along with cash from operations in an all cash deal for acquisition of the full SABIC PIF stake in 2020. The agreed value of Aramco’s takeover of PIF’s 70 percent SABIC stake is \$69.1 billion.

Figure 4 shows the 2020 sale of PIF’s ownership stake in SABIC. As a result, the Saudi government will no longer receive SABIC dividends directly. Instead SABIC dividends will be collected by Aramco where nearly all dividends are still due to the Saudi Government in 2020. Assuming Aramco sells \$69.1 billion in bonds, the deal adds a one-time cash sum of \$69.1 billion to PIF for the benefit of the Saudi Government.

Ownership Aramco 2018

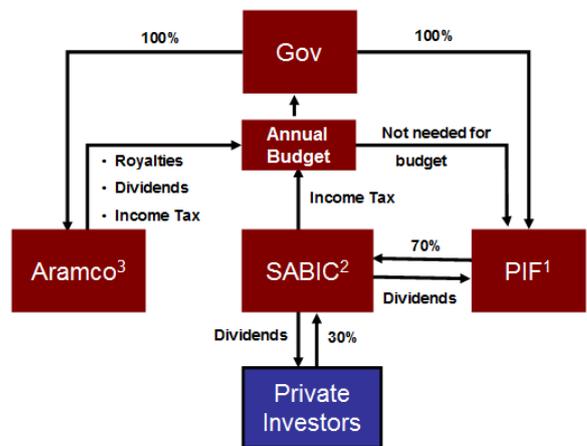


Figure 2. Aramco 2018 ownership structure. Notes: 1. PIF=Public Investment Fund of Saudi Arabia, its Sovereign Wealth Fund (SWF) with a global investment portfolio. 2. SABIC trades on Saudi Stock Exchange (Tadawul). 3. Aramco still 100% privately held by Saudi Government. (©Authors)

Ownership Aramco 2019

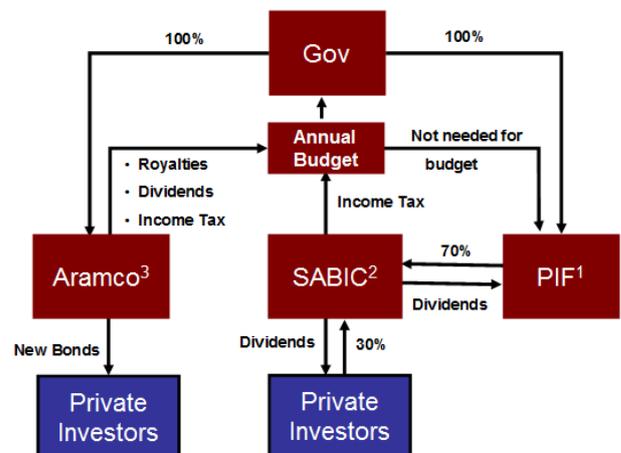


Figure 3. Aramco 2019 ownership structure. Notes: 1. Last year that PIF will receive SABIC dividends. After selling SABIC share to Aramco in 2020, PIF will receive a one-time payment of \$69.1 billion. 2. SABIC trades on Saudi Stock Exchange (Tadawul), and agrees 29 March 2019 to deal which transfers PIF stake to Saudi Aramco by 2020. 3. Aramco starts issuing bonds in 2019 to raise cash for the 2020 acquisition of SABIC (©Authors)

2020 SABIC Acquisition

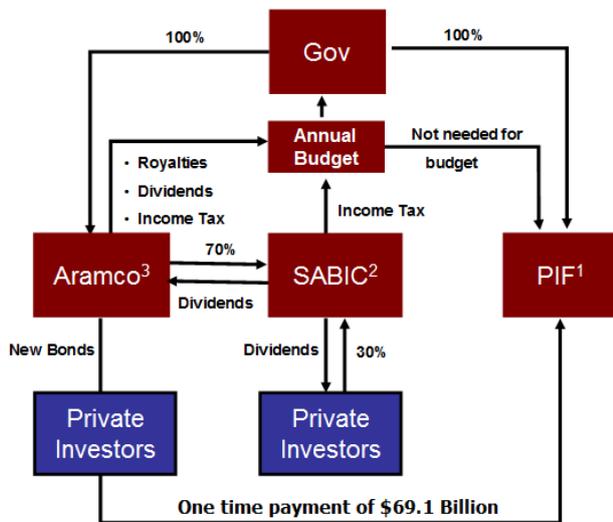


Figure 4. Aramco 2020 ownership structure. Notes: 1. In 2020, PIF divests its 70% SABIC stake to Aramco for an agreed price (as stated in 29 March 2019 contract) of \$69.1 Billion. 2. SABIC becomes (70%) subsidiary of Aramco after 2020 completion of PIF transaction. Aramco will control and direct SABIC via major share. SABIC contributes cash from investment activities (at 70% holding values) to Aramco’s annual cash flow statement from date of deal onward. 3. Aramco issues bonds in 2019 and 2020 as required to pay for SABIC acquisition (bond issued possibly for less than \$69.1 billion, as management stated possibly also using cash from operations). (©Authors)

Aramco after 2021 IPO

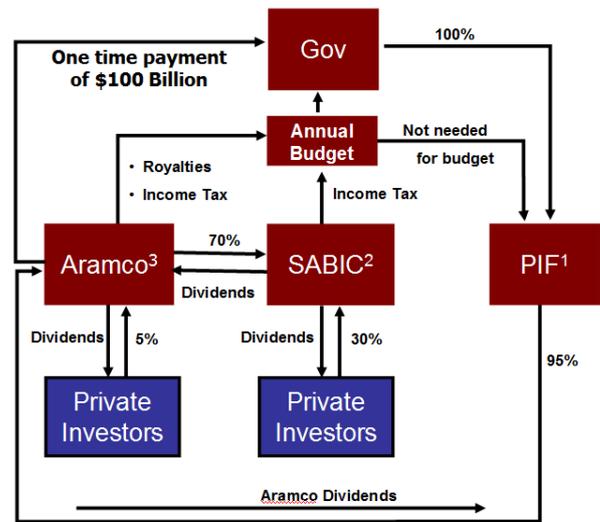


Figure 5. Aramco 2021 ownership structure. Notes: 1. In 2021 Aramco IPO, Saudi Government is likely to place 95% of Aramco shares in PIF, because after stock listing of Aramco, the shareholder must be an investment vehicle. 2. SABIC remains separately traded as an Aramco subsidiary. 3. Aramco IPO will initially sell 5% stake to private investors and gives Saudi Government one time payment of the IPO value (~\$100 billion), which likely will be placed in PIF for diversified local and global investments. For Government selling of stake is a one time windfall in return for “losing” 5% of all future Aramco dividends to private investors. (©Authors)

3. Financial Analysis

An effective way to build a deeper understanding of how the corporate restructuring will redirect corporate cash flows is to analyze how Aramco's balance sheet (Section 3.1), cash flow statement (Section 3.2) and income statement (Section 3.3) will likely be affected by each element of the strategic restructuring (see below).

3.1. Aramco 2019 and 2020 Balance Sheets

New bonds issued by Aramco in 2019 and 2020 (Figure 4, Figure 5) will appear as a long-term liability on its balance sheets for those years. Assuming \$12 billion is raised from bond issues in 2019 and another \$38 billion in 2020. Aramco can pay the remaining \$19.1 billion of the \$69.1 billion SABIC acquisition price using 2020 cash flow from operations (Aramco had \$39.5 billion in cash as of June 30, 2019 and paid \$58 billion in dividends for 2018). There will be no changes to the 2019 and 2020 balance sheets other than logging the liability increase, which goes at the expense of the Owner's Equity.

SABIC assets will not be added to the Aramco balance sheet. As a subsidiary SABIC will prepare its own financial statements, pay its own income taxes and dividends, and use its own depreciation posts (DD&A) to lower the corporate income tax burden all by itself. What Aramco as the parent company must do is report cash from investment activities in its cash flow statement, which will include the 70 percent net income and any dividends due to Aramco as the new parent company of SABIC (Figure 5).

3.2. Aramco 2019 and 2020 Cash Flow Statements

The 2019 Aramco cash flow statement includes the proceeds from the newly issued bonds under cash from financing activities. In 2020, the additional bond proceeds will be recorded on the 2020 cash flow sheet. The 2019 bonds no longer show since the cash flow statement only accounts for cash sources and sinks for the current year. The newly raised 2019 cash was held by Aramco to pay PIF for the SABIC purchase; the cash was included in the 2019 current cash account on the balance sheet.

The SABIC deal is to be closed in 2020 and the acquisition will be logged by Aramco as a cash outflow of \$69.1 billion (Figure 5) on the 2020 cash flow statement under cash from investing activities. The cash hoarded on the current account of the 2019 balance sheet, will be lowered on the 2020 balance sheet by the SABIC acquisition price. In 2020, after acquiring SABIC, Aramco will begin to report the additional cash from investment activities in its cash flow statement of that year, corresponding to 70 percent of net income by SABIC and any dividends awarded.

3.3. Aramco 2019 and 2020 Income Statements

Aramco will pay interest on the corporate bonds (issued in 2019 and onward), depending on the type of bond issued (Figure 4, Figure 5). The new bonds carry approximately 3.5 percent annual interest payment (weighted average interest rate from the 2019 bond issue was 3.77 percent), interest paid is subtracted from 2019

and 2020 income from operations (before income tax to effectively lower the corporate income tax). Aramco also had to pay for the cost of the global consortium of banks that organized the bond sale, the prospectus, reserves audit and financial audits. That cost shows up on the 2019 income statement as an extraordinary admin cost (and lower income tax for 2019). We estimate the cost at \$0.5 billion, as financial advisers and auditors charge hefty fees. The final cost will appear on the income statements of the financial reports of the corresponding years.

4. Effects of Aramco's 2021 IPO

To evaluate the effect of further 2021 Aramco IPOs on Aramco's business, a final restructuring diagram was prepared (Figure 5) aimed at clarifying the corporate shift in ownership structure due to corporate restructuring, and which value transfers will result from the IPO deals. Although we still do not know any details about the final IPO size and structure, let us assume the simplest and common way. The IPO first turns Aramco into a private company with 100 percent of the shares transferred to PIF. During the same IPO 95 percent of the shares will remain with PIF (unissued-non-paid) and the other 5 percent of the shares are floated to private investors.

Privatization of Aramco, we assume, will involve selling a cumulative 5 percent stake to private investors in 2021. Whatever the final IPO size, the principles will remain the same. A 5 percent float would give the Saudi Government a cash payment in the amount of the IPO value (\$100 billion based on 5 percent of \$2 trillion valuation), which sum will likely be placed in PIF for diversified local and global investments. Effectively, PIF or the government enjoys a one-time payment equal to the IPO value.

For the Government, selling a 5 percent stake in Aramco liberates a cash windfall, in return for conceding 5 percent of all future Aramco dividends to private investors. To evaluate the effect of the assumed 2021 IPO on Aramco business, again we go from balance sheet (Section 4.1), to cash flow statement (Section 4.2), to income statement (Section 4.3), keeping a keen eye on Figure 5.

4.1. Aramco 2021 Balance Sheet

New bonds issued by Aramco in 2019 and 2020 will occur as a long-term liabilities on the company's 2021 balance sheet. Assume \$12 billion was raised from bond issues in 2019 and another \$38 billion in 2020, so that creates a \$50 billion long-term debt liability. Capital paid in by private investors will be logged for the grossed IPO amount (as an equity liability). As a net result, Owner's Equity is still reduced by the long-term debt liability.

4.2. Aramco 2021 Cash Flow Statement

Aramco will briefly have proceeds of the 5 percent IPO on its 2021 cash flow account (under cash inflow from financing activities). But that sum will be immediately paid to Government or PIF (in the 5 percent exit strategy)

(Figure 6). No *net cash inflow* occurs for Aramco on its 2021 cash account since Aramco will report IPO cash inflow on cash from financing activities and immediately pay out the same sum to the Government or PIF (in the 5 percent exit strategy). Ultimately, Aramco's IPO will be successful only if dividend streams are generated for shareholders.

4.3. Aramco 2021 Income Statement

Aramco will continue paying interest on the bonds until maturation date bond expiry, when the principal sum is due too. We assumed bond expiry dates after 2030, to keep things simple (in reality, the first tranche was a 10-year bond placement, maturing in 2029). As for the IPO process, there will be no direct income impact, other than that of the incurred IPO cost. For the actual IPO cost, we assume \$0.5 billion will be plausibly logged on the 2021 income statement (as a cost prior to income tax). The IPO cost will show up on the 2021 income statement as an extraordinary admin cost (and lowers the income tax for 2021, so the government pays effectively for the IPO cost).

5. Forward Financial Projections

5.1. Aramco Future Performance

Aramco's impending, first decade of private performance requires a forward financial performance analysis. Forward projections of the Aramco's annual financial performance are possible, making certain assumptions about debt and equity financing. Using spreadsheet templates populated with the three financial statements with Aramco's historic performance data (2016-2018). Forward projections from 2019 onward through 2030 required assumptions on future production output, oil prices, cost of capital, dividends to be paid out to shareholders.

For example, future financial performance assumed \$10 billion in new bonds will be issued by Aramco every year from 2021 until year 2030. For future income and depreciation, creative assumptions were made making use of the stated royalty schedule (given on p. 43 of Management discussion in the Aramco Prospectus).

The effects of Aramco's 2020 SABIC acquisition and 2021 IPO were accounted for on the three financial statements. For the forward planning of the equity position, the 2021 IPO was assumed to be the only equity issuance by the company. Forward projections of Aramco production output are based on historical trends of Saudi Arabian oil production by the St. Louis Federal Reserve Bank (Figure 6a). Using a simple linear regression, production is forecast to increase to 12 million barrels per day in 2030 (which is considered reasonable based on Aramco's current maximum production of approximately 12 million barrels per day). Our forecasts were completed just prior to the current Corona Pandemic and showed continued growth in global oil demand until at least 2030. The impact of the pandemic is not taken into account in the present study, as the long-term impact is still unpredictable as per the completion data of our study.

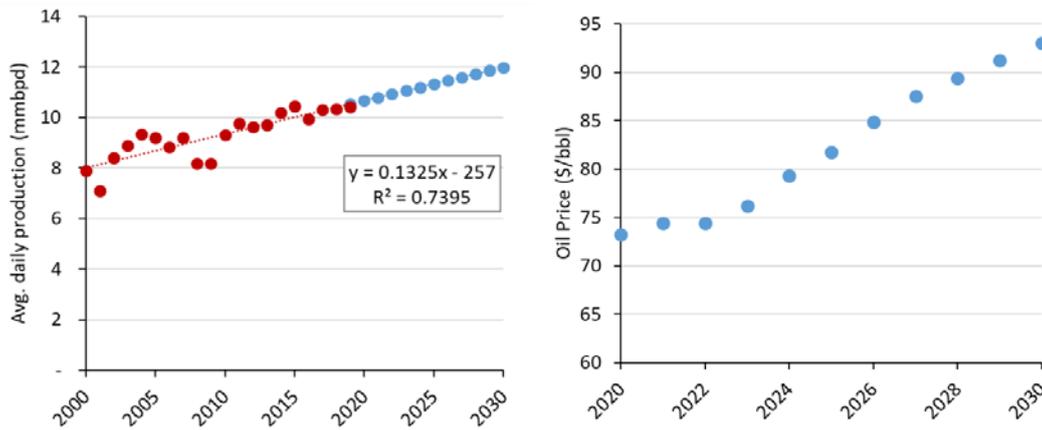


Figure 6. (a) Historical and forecast Saudi average daily production [12]. (b) US EIA long-term oil price forecast [13]

Further assumptions made are:

- Total revenue for Aramco may be calculated assuming upstream operations revenue will continue to account for 61 percent of total revenue as per Aramco board comments.
- For oil price we adopted the US EIA long term oil price (Figure 6b; EIA reference case) to calculate gross revenue.
- DD&A may be assumed to be 5 percent of gross upstream oil and gas revenue.
- Dividend payouts may be assumed to be 30 percent of pre-tax income.
- OPEX may be assumed to be 25 percent of net revenue based on 2016-2018 data.
- Royalties paid to government will be 40 percent of gross oil revenue based on oil price forecast above \$70 per barrel (but less than \$100 per barrel, as the latter would have increased the royalty rate to 50 percent).
- Income taxes were calculated to be 50 percent as per Saudi announced taxation policy.

The performance analysis allows for computation of the future revenue and net income after taxation (Figure 7a). The projected future cash flow from Aramco are given in Figure 7b. Cash from operations will be positive. Cash from investment activities is burdened by capital expenditures for new field development, which results in a

net cash outflow (Figure 7b). Cash from financing activities reflects new debt assumed based on annual bond issues and is burdened by annual dividend payments, resulting in net cash outflow (Figure 7b).

Net cash flow is positive (Figure 8a), and current cash will accumulate on the balance sheet (Figure 8a). The cash flow projections in Figure 7a, Figure 7b provide for annual dividend payments as detailed in Figure 8b. The Aramco Board has stated an intention to distribute an annual base dividend of \$75 billion for 2020, and made pledges for the years 2020 to 2024 as follows (Investor Presentation Fall 2019). If annual dividends based on balance sheet performance would deteriorate and fall below \$75 billion, dividends to non-Government shareholders are intended to be prioritized so that they receive their pro-rata share of a \$75 billion equivalent dividend; the Government will receive the remaining amount of dividend. Also, when dividends to shareholders were to rise above \$75 billion, non-Government shareholders will receive their pro-rata share of the increased dividends.

The company’s potential for value creation is separately plotted in Figure 9, which shows how much profit from operations could be reinvested in the company as cumulative retained earnings. The retained earnings in our projection for the given assumptions thus may quadruple over the next decade.

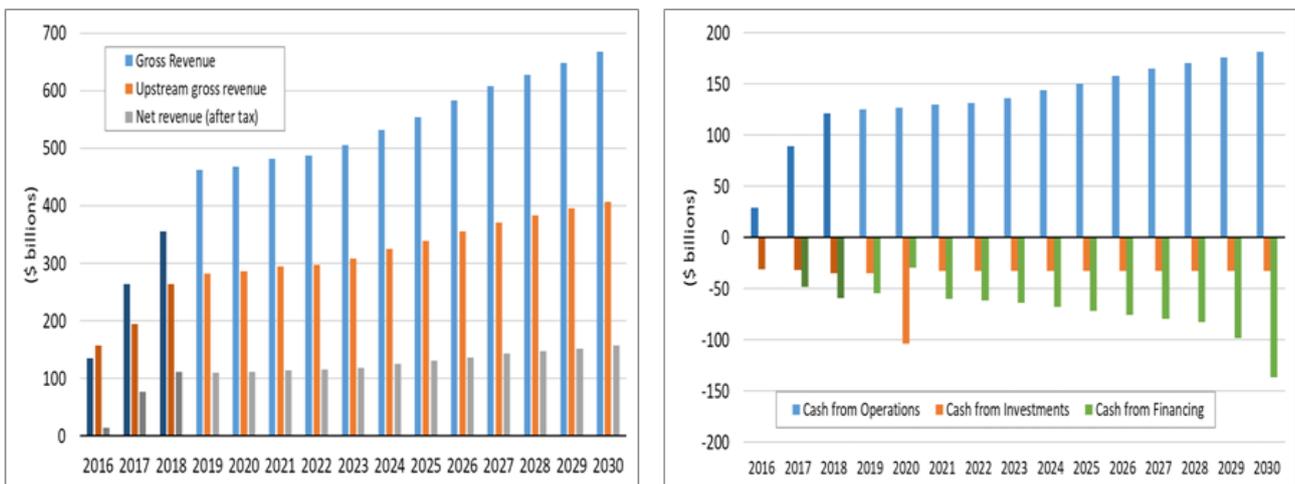


Figure 7. (a) Historical and forecast revenues. (b) Historical and forecast cash flows

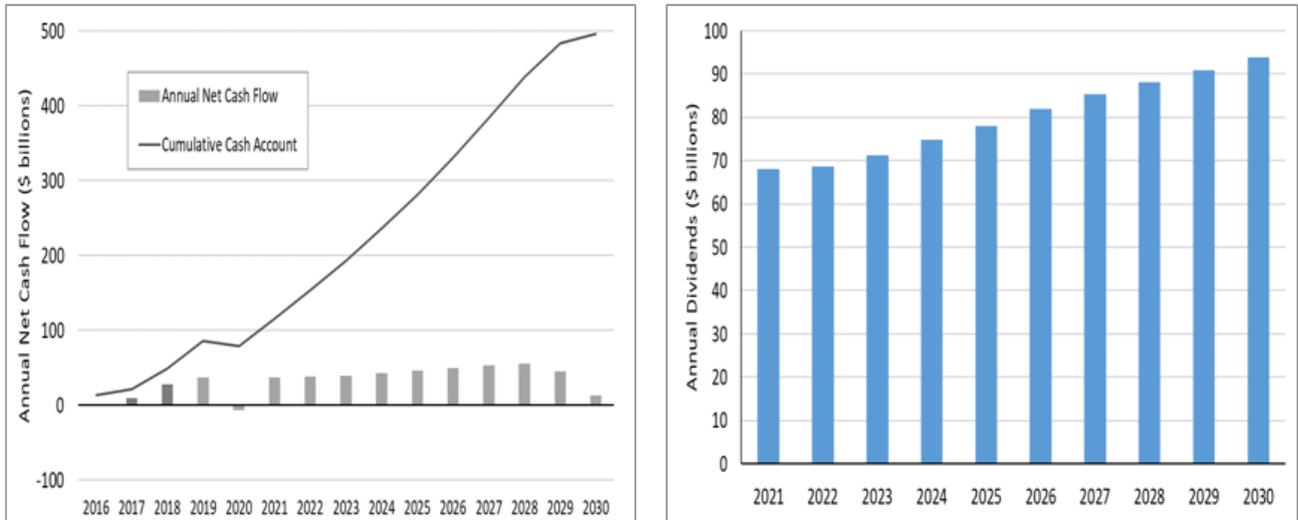


Figure 8. (a) Historical and forecast annual net cash flow and cumulative cash account. (b) Forecast annual dividends

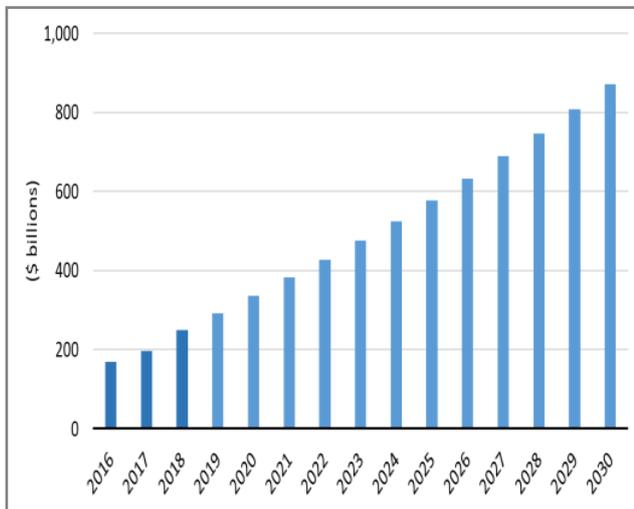


Figure 9. Historical and forecast retained earnings

5.2. Aramco Valuation in Share Flotation

Based on the forward financial projections, we estimated what the Saudi Government may earn from the planned 2021 IPO based on comparable dividend yield and a discounted cash flow analysis of Aramco’s dividend stream. The forecasted dividend payment in 2021 is \$68.8 billion (based on the detailed analysis explained in Section 5.1). Assuming shares are priced at a 5.5 percent dividend yield (weighted average for super majors), the total estimated market capitalization of Saudi Aramco would be \$998 billion and the 5 percent IPO value would be \$49.9 billion (Figure 5). Using the low dividend yield (4.2 percent) increases the market capitalization to \$1.56 trillion and the 5 percent IPO value would be \$78 billion.

An alternative approach is to calculate net present value (NPV) of all future dividend payments. Dividends from 2021 to 2030 were calculated as explained in Section 5.1, while dividends after 2030 were modeled as perpetuity with a growth rate of 3.2 percent based on the average dividend growth rate from 2028 to 2030. Using a discount rate of 10 percent, the NPV of the dividend payments and perpetuity is \$1.175 trillion resulting in a 5 percent IPO value of \$58.8 billion.

6. Discussion

6.1. Saudi Aramco’s Future Swing Producer Role

This study places Saudi Aramco’s oil supply role in historic context and analyzes the possible short-term and long-term consequences of the privatization program for the various Aramco stakeholders (Saudi Government and future private investors). The possible effects on the global energy supply system are briefly considered below. Currently, Saudi Aramco is responsible for virtually all of Saudi Arabia’s domestic oil production, which corresponds to about 32 percent of OPEC oil produced (Figure 10a). OPEC’s market share is about 35 percent of global oil supply (Figure 10b).

In the past, Aramco has played the role of the global swing supplier, and one may ask if a privatized company can move global oil prices the same way as when fully controlled by the Saudi Government. Under normal circumstances the dominant market firm (Saudi Aramco) ensures that the global oil market remains more or less balanced (see also [14,15]). Back in 2008-2009, OPEC helped to restore oil prices rapidly by steep production cuts in response to lagging oil demand due to the global recession. Normally, the dominant market firm with swing production capacity tries to keep supply either in balance or slightly exceeding demand (as in the 1990s).

High oil prices after the brief 2008/2009 recession had brought higher cost producers (e.g., U.S. shale oil companies) into the market, as occurred rapidly between 2009 and 2014. Despite much higher production costs than Saudi Aramco, US shale companies still produce at lower marginal costs than for offshore (ultra) deepwater fields in the Gulf of Mexico and onshore unconventional assets such as Alberta oil sands. Aramco’s marginal cost of production in 2014 is estimated at \$35/bbl, about half that of the oil majors [16]. Aramco possesses the appropriate infrastructure (and favorable reservoir conditions) to change its contemporary production at a rate of about 1 million barrels per month, which means it would take about 2 months to bring online a spare capacity of about 2 million barrels/day.

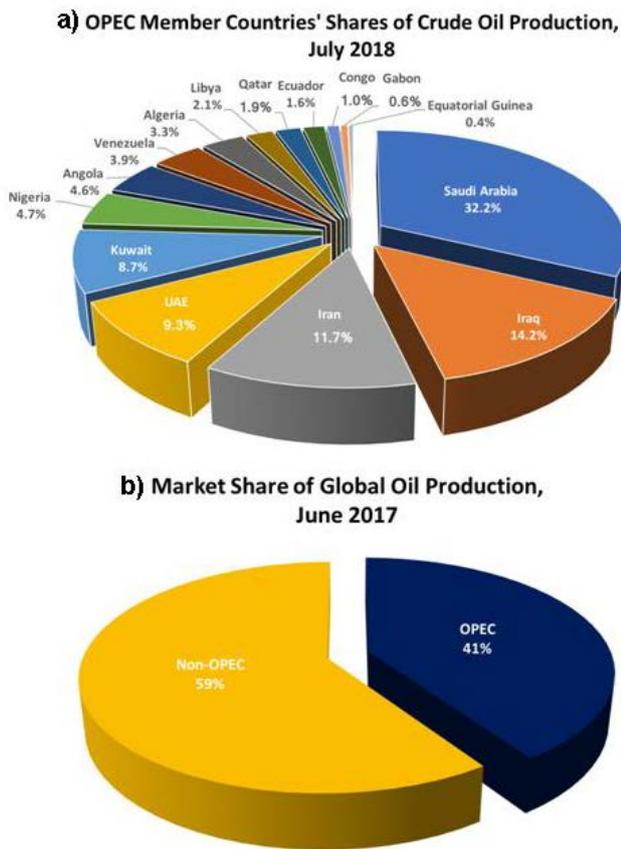


Figure 10. (a) Saudi's OPEC production share. (b) OPEC's share of global oil production (source: IEA Oil Market Report, 2017)

As U.S. shale oil producers have rapidly expanded their production since the start of the shale oil boom in late 2010 and by the end of 2014 added 4 MMbbl daily to global oil supply (in addition to Canada's increased output from heavy oil sands to 3.7 MMbbl/day at the end of 2014, up from 1.1 MMbbl/day in 2008; [17]), the glut pushed down oil spot prices in late 2014 far below the marginal production cost. Growth in non-OPEC supply had captured almost all of the demand growth over the past decade, without any net growth for OPEC producers.

In response to the global oversupply Saudi Arabia kept flooding the market with "under-priced" crude oil, with the stated aim to prevent further erosion of OPEC market share. During the 2014-2016 oil price slump, the company did not try to balance global oil prices by production cuts [3]. The question is what incentives will Saudi Aramco have as a partly privatized company to stay aligned with OPEC policies? Will Aramco oversupply the market with slumping oil prices to defend OPEC's market share as in the period 2014-2016 which would mean a short-term loss of shareholder income? As privatization continues to progressively transfer equity to private investors, Aramco's role as swing producer with a political dimension may become untenable since private investors will have a say on the future direction of the company, and need to be heard and satisfied for the company to remain as an esteemed and viable investment opportunity for global investors.

6.2. Global Leadership in Energy Supply System Transition

We also note that corporate leadership today requires more than making short-term financial business decisions with the additional responsibility to mitigate unintended adverse effects of investment decisions on the global community and the planetary ecosystem. The "smaller" oil companies listed in Figure 1a have made some strides in developing visions for participation in the global energy transition. A privatized Aramco would be in a position to lead the world's oil companies into the much needed transition to a more carbon neutral and sustainable energy system, particularly when stakeholders express their wishes to develop wholesome corporate strategies and visions for a sustainable future.

Saudi Aramco's official 2019 corporate vision statement reads: "To be the World's pre-eminent integrated energy and chemicals company, operating in a safe, sustainable and reliable manner". Its 2018/2019 environmental targets include: Upstream carbon intensity of 10.2 kg CO₂/boe, methane intensity of 0.06 percent per ton of marketed sales gas, and gas flaring volume less than 1 percent of total gas production.

The company has embarked on a program to plant 1 million trees native to Saudi Arabia planted throughout the Kingdom by 2025. Previously, the company planted 2 million mangrove trees along the shores of the Arabian Gulf coast (completed in 2017). The idea is to create a vegetation cover in order to reduce the effects of sandstorms and absorb 20,000 metric tons of CO₂ per year. Further, Saudi Arabia has established, in 2010, a non-profit global institution dedicated to independent research into energy economics and policy making, King Abdullah Petroleum Studies and Research Center (KAPSARC), which provides research that can positively affect Saudi Aramco in defining its new global leadership role.

The greenhouse gas effects of fossil fuel usage prompt for an accelerated shift to renewable energy resources. At present oil provides about 35 percent of the global energy supply system and nearly all the world's transportation fuel is sourced from oil (Appendix A). A holistic framework that optimizes decision-making at every step in the global energy system is needed [18]. Unfortunately, such a holistic framework cannot be enforced in the current market-driven macro-economic system. Consequently, the global energy business is not guided by total system optimization, but rather by maximization of corporate profits and socialization of pollution and greenhouse gas emissions (see Energy Strategy Research Charter; [19]). Corporate leadership is needed to bend the curve to our favor and major companies can play a defining role in this process.

7. Conclusions

We have presented one of the first comprehensive analyses of the possible consequences of the impending privatization of Saudi Aramco. A principal short-term

focus of the privatization is on the financial gains for the Saudi Government and its Public Investment Fund (PIF). The motivation for our independent in-depth analysis was triggered by corporate strategy analysis in petroleum economics classes taught at Texas A&M University, which routinely brings in new case studies.

The analysis of Aramco's corporate financial statements (2016-2018) and forward projections based thereupon provide unique insight into an interesting business case in energy strategy studies. The present analysis shows: (1) How corporate deals can affect/generate/ensure cash required for capital expenditures (capex) and operating expenditures (opex) in field projects, (2) How capex outlays are expended on the cash flow statement and capitalized on the balance sheet, (3) How depreciation, depletion and amortization (DD&A) lower the income tax burden, and (4) How DD&A help to distribute capex over future income statements, giving an energy production company the opportunity to make a profit early on, despite of huge capex outlays early in field development. Ultimately, the Aramco IPO provides a very instructive business case study with unrivalled stakes.

The impending continuation of Aramco's IPOs will only be successful (i.e. achieve its desired valuation) if investors are confident that Aramco will be able to generate the necessary dividend streams. The details of its financial engineering are presented here in a unique case study which is instructive for future energy business leaders, major field asset managers, and for those who are or will become CFOs and CEOs. The critical role and value of oil and gas reserves/assets on the balance sheet for debt and equity financing has been highlighted in our analysis. Our study may also be useful for internal and external oil and gas reserves auditors, and financial analysts with major energy investment banks and stock brokers.

Investors are well advised to check the dividend payment schedule of SABIC as an indication of what to expect will be the dividend diligence of Aramco (still controlled by Government via a PIF majority share after the IPO. Our analysis results in a valuation range of approximately \$1 to \$1.56 trillion for Aramco, that while unprecedented in size, still falls short of the \$2 trillion valuation claimed by the Saudi Government. In addition to the financial challenges analyzed in this paper, Aramco also faces the potential for significant headwinds to its lofty goal of a \$2 trillion valuation which include: geopolitical risk such as the recent drone attacks on Aramco infrastructure or potential war between Saudi Arabia and Iran; lower oil price outlook due to increasing concerns over climate change; governance risk with the Saudi Government remaining majority shareholder with at least 95 percent ownership. In addition, we have observed in spring 2020 an emergent decline in energy consumption due to the stagnation in global transportation systems after the Corona-virus outbreak.

Past failures of major IPOs will serve as a clear reminder that IPOs do not always go as planned especially with unrealistic valuations. The Aramco IPO was originally announced in 2016 with a planned float in 2018, but that was postponed due to concerns over valuations. It remains to be seen whether the IPO will occur in 2021 as planned.

Disclaimer: Our analysis is based on our detailed analysis of past performance data, complemented with forward projection based on the assumptions stated. We think our results are plausible but numbers assumed may change in the future for a variety of causes. No attempt has been made to assess the impact of political tensions and/or military/terrorist strikes on Aramco assets and facilities. The impact of the Corona-virus 2020 Pandemic has not been taken into account in our study.

Highlights

- Saudi Aramco restructuring analyzed
- Proceeds to Saudi Government of Aramco's oil trade quantified
- Projections of Saudi Aramco financial performance for the coming decade
- Saudi Arabia's future role as global swing producer reviewed
- Energy transition leadership options highlighted.

References

- [1] Weijermars, R., 2015. Natural Resource Wealth Optimization: Fiscal Regimes and Equitable Agreements for Petroleum and Mineral Extraction Projects. *Natural Resources Research (NARR)*, vol. 24 no. 4, p. 385-441.
- [2] Base Prospectus, 2019. Saudi Arabian Oil Company. Global Medium Term Note Programme. Base Prospectus dated 1 April 2019. (469 pages)
https://www.ms-pdf.londonstockexchange.com/ms/6727U_1-2019-4-1.pdf.
- [3] Weijermars, R. and Sun, Z., 2018. Regression Analysis of Historic Oil Prices: A Basis for Future Mean Reversion Price Scenarios. *Global Finance Journal*, v. 35, p. 177-201.
- [4] Rodrigues, W. and Weijermars, R., 2016. Assessing the impact of two recessions on the oil and gas industry: severity of declines and future outlook. *First Break*, vol. 34, January Issue, p. 79-85.
- [5] Weijermars, R., Clint, O., and Pyle, I., 2014. Competing and Partnering for Resources and Profits: Strategic Shifts of Oil Majors during the past quarter of a Century. *Energy Strategy Reviews*, vol. 3, p. 72-87.
- [6] Weijermars, R., Johnson, A., Denman, J., Salinas, K., and Williams, G., 2018. Creditworthiness of North American Oil Companies and Minsky Effects of the (2014-2016) Oil Price Shock. *Journal of Finance and Accounting*, Vol. 6, No. 6, p. 162-180.
- [7] Weijermars, R., 2013. Economic appraisal of shale plays in Continental Europe. *Applied Energy*, Vol. 106, p. 100-115.
- [8] Weijermars, R., 2014. US shale gas production outlook based on well roll-out rate scenarios. *Applied Energy*, vol. 124, p. 283-297.
- [9] Rogner, H.-H. and Weijermars, R., 2014. The uncertainty of future commercial shale gas availability. SPE14 UNCV 167710MS, p. 1-11. SPE/EAGE European Unconventional Conference and Exhibition held Vienna, Austria, 25-27 February 2014.
- [10] Weijermars, R., Sorek, N., Seng, D., and Ayers, W., 2017a. Eagle Ford Shale Play Economics: U.S. versus Mexico. *Journal of Natural Gas Science and Engineering (JNGSE)*, vol. 38, p. 345-372.
- [11] Weijermars, R., Paradis, K., Belostrino, E., Feng, F., Lal, T., Xie, A., and Villareal, C., 2017b. Re-appraisal of the Bakken Shale Play: Accounting for Historic and Future Oil Prices and applying Fiscal Rates in North Dakota, Montana and Saskatchewan. *Energy Strategy Reviews*, vol. 16, p.68-95.
- [12] Federal Reserve Bank of St. Louis Economic Data (FRED), 2019. Crude Oil Production for Saudi Arabia (SAUNGDPMOMB). <https://fred.stlouisfed.org/series/SAUNGDPMOMB>.
- [13] EIA (2019, 24 January). Annual Energy Outlook 2019 with projections to 2050. <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>.

- [14] Brackett, B., Beveridge, N., Green, N. J., Clint, O., Salisbury, J. A. and Spencer, B. (2015, April 30). Bernstein E&Ps: Know your producer—Saudi Arabia. Bernstein Research (proprietary report).
- [15] Santis, R. A. D. (2003). Crude oil price fluctuations and Saudi Arabia's behavior. *Energy Economics*, 25(2), 155-173.
- [16] Clint, O., Beveridge, N., Brackett, B. and Green, N. J. (2015, January 5). Bernstein Energy: Up or down? An oil price view for 2015. Bernstein Research (proprietary report).
- [17] Sieminski, A. (2015, April 7). Oil and natural gas supply and demand trends in North America and beyond. Retrieved from U.S. Energy Information Administration website: http://www.eia.gov/pressroom/presentations/sieminski_04072015.pdf.
- [18] GEA. (2012). *Global energy assessment—Toward a sustainable future*. Vienna: International Institute for Applied Systems Analysis, and Cambridge and New York: Cambridge University Press.
- [19] Weijermars, R., Bahn, O., Capros, P., Das, S. R., Griffiths, S., Lund, H., Rogner, H.-H., Taylor, P., Wei, Y.-M., Liao, H., and Shi, X. (2012). Energy strategy research: Charter and perspectives of an emerging discipline. *Energy Strategy Reviews*, 1, 135-137.
- [20] LLNL, 2014. World Energy Flow Chart. <https://flowcharts.llnl.gov/>.

Appendix A

The global transportation sector consumes nearly half of all oil produced. For example, of all oil produced, 26% to 29% goes to the automotive sector, and another 20% to air and sea transport sectors. Upstream oil supply is connected to a downstream part of the fossil fuel value chain, via refineries and fuel stations (Figure A1).

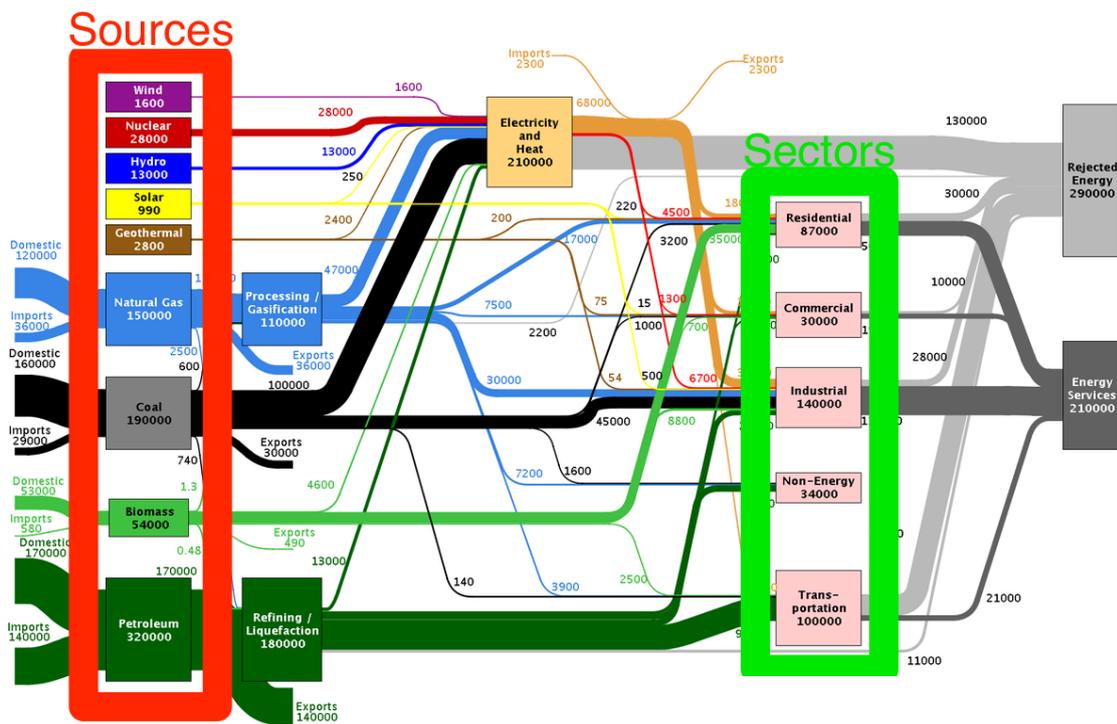


Figure A1. World Energy Flow Chart by Lawrence Livermore National Laboratory. Based on the 2013 World Energy Balance by Information Energy Administration. Units in PetaJoule. [20]



© The Author(s) 2020. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).