

# **The Refining Industry- Continued Misalignment amid Investment Illusion**

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More than fifteen years ago a new refinery-specific law was promulgated and then the Ministry of Oil-MoO paid millions of dollars for commissioned international consulting firms to undertake Front End Engineering and Design- FEED and feasibility studies for a number of new refineries configured to produce petroleum derivatives in compliance with Euro 4/5 standard.

Many tacit objectives stood behind the move: modernize the refining sector to address initially domestic supply-demand misalignment (import substitution) and then export the surplus (export promotion). All that to introduce a vertical structural diversification along the value-chain of petroleum (desirable structural change) and the new refineries should, mostly, executed through private investment, national or foreign (privatizing the refining industry). When the FEED and feasibility studies were done, MoO organized promotional events to attract private investors for these new modern refineries and throughout the years many of the refineries went for repeated offering.

At end 2020, none of those refineries materializes despite of the many and high valued incentives and exemptions offered by the related investment laws. Surprisingly, the Ministry keeps déjà vu; reoffering and offering even more other new refineries for investment without any FEED or feasibility studies.

Recently, I published two-part essay written in Arabic, circulated widely and posted on many websites; the essay undertakes, in [part one](#), comparative Gap Analysis, uses formal data, adheres to evidence-based approach and presents six facts (with Infographic) featuring the reality of the refining sector. In [part two](#), the essay argues that lack of planning, mismanagement, wrong policy orientation captured by private investment illusion and, possible, formidable “pressure interests” had contributed to this very serious failure of Iraq’ oil policy that keeps costing the country dearly, annually. The essay presents some suggestions to remedy the situation.

This article is premised on the findings of the said essay; it also demonstrates that refinery gap manifests chronic local production-demand misalignment as outcome of the technological

configuration of the outdated refineries. It calls for careful important distinction between two types of refinery gap analysis: aggregate and product-specific to avoid misleading interpretation and wrong policy recommendations. The article argues further that private investment illusion-PII causes the country dearly, through dual-capturing effects, due to delay in resolving refinery gap. All charts are based on formal monthly data retrieved from different credible sources and compiled tabulated and produced by this author.

### **Chronic Misalignment and Structural Product-Specific Refining Gap**

Refining gap can be demonstrated through two different versions, aggregated and qualitative (product-specific); aggregated refinery gap-**ARG** shows a comparison between “total production” of all working refineries in the country at particular period of time and “total domestic demand on all petroleum products”. The qualitative measure is a product-specific refinery gap-**PSRG**, which shows the comparison between the “total of each petroleum derivative produced by all working refineries” in the country at particular period and corresponding “total domestic demand on each petroleum products”.

The merit of PSRG measure it highlights the misalignment in production-demand and the implication of such misalignment, while ARG fails to do so. Moreover, ARG could cause misleading interpretation and wrong policy recommendation when it shows “surplus” in the aggregate while in reality there is sever “shortage” in the highly demanded products. Hence, PSRG identifies, simultaneously, the surplus and shortage of the products and thus calls for different policy implications to address the misalignment through export (in case of surplus) and import (in case of shortage), among others means such as technological solutions and upgrading processes.

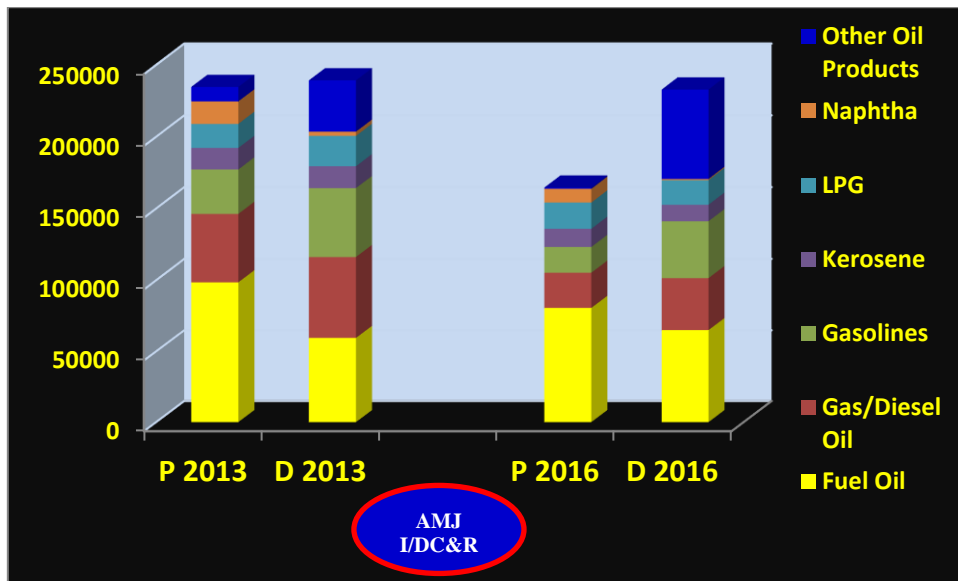
Both ARG and PSRG could be an outcome of circumstantial and structural reasons. For example the comparison of ARG and PSRG between 2013 and 2016 manifest the impact of Daesh (ISIS) that inflicted serious blow to Iraq’s refining sector by destroying Baiji Refining complex; thus disabling almost one-third of the country’s refining capacity.

ARG deepens from (-4611 thousand barrels-kb) in 2013 to (-68339kb) in 2016; while PSRG maintains that Fuel oil was at “surplus” while “other oil products, gasoline and Gas/Diesel oil” were at “shortage” in both years, as exhibited in the following chart.

#### **Chart (1)**

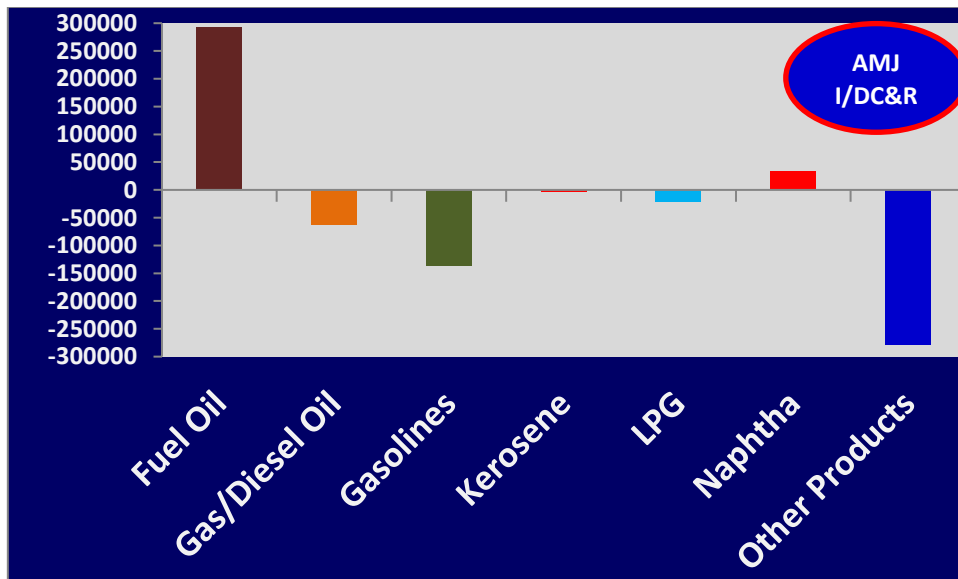
#### **PSRG 2013-2016 (kb)**

(P: Production, D: Domestic Demand)



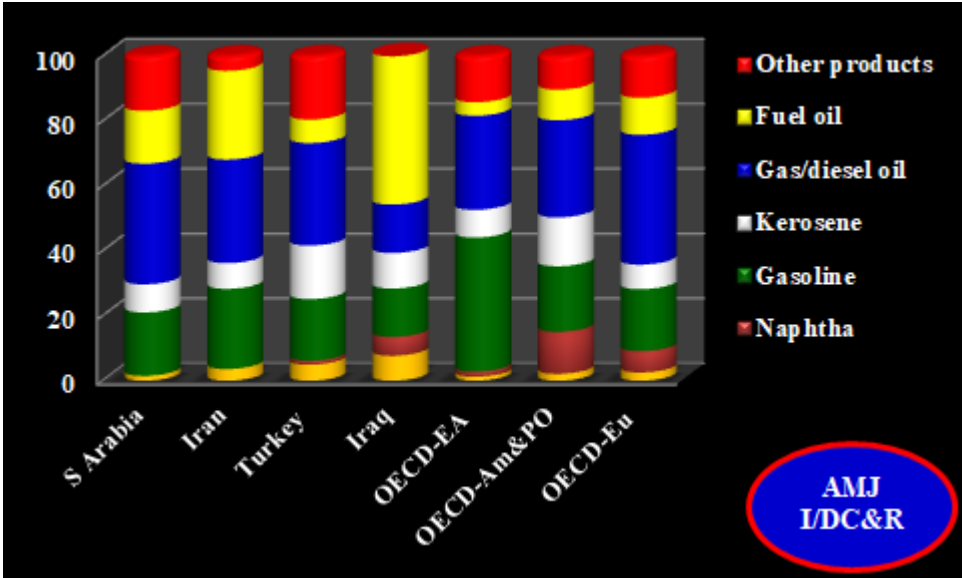
But the misalignment is chronic and thus more structural than circumstantial. During the period 2009 through to 2016, ARG was (-178032 kb) and PSRG, as exhibits in chart 2, reveals the same pattern regarding which products that have been on surplus and which on deficit during the entire same period.

Chart (2)  
PSRG 2009-2016 (kb)



Moreover, the outdated refinery configuration in Iraq compared with regional neighboring countries and other regions in the world is confirmed by the following chart.

**Chart (3)**  
**Refinery Products Configuration**  
**2016 (%)**



**Unsuccessful Remedies for Refining Gaps**

The government pursued different paths in resolving the chronic, structural and costly refining gaps.

On the legislative path, a specific [Law 64 of 2007](#) aims at encouraging private investment in the refining industry was promulgated and amended twice, so far. That law offers attractive terms through variety of base modalities. Moreover, private refineries benefit from the privileges offered by another Investment Law 13 of 2006.

MoO commissioned and paid millions of Dollars to many known international consulting firms and companies to prepare FEED and feasibility studies for five new modern refineries with capacity ranging between 140 thousand barrels daily-kbd and 300kbd, all based on Euro 4/5 standard. Moreover, MoO organized promotional workshops and events for those new refineries as standalone investment opportunity for each one of them and for the Nassirya Refinery with 300kbd was offered also as tied-to-oilfield development through [Nassirya Integrated Project-NIP](#).

While none of the standalone refineries attracted any serious private investor, 18 IOCs and consortia applied for NIP and 12 of them were prequalified by PCLD of MoO. Mysteriously, NIP was abandoned a couple of months before the scheduled licensing round!!

Out of those five new refineries one was state-funded (Karbala with 140kbd) contracted early 2014 and Missan refinery, with 150kbd offered to [Satarem](#) (financially bankrupt, technically incompetent and never constructed a refinery) through MoU of December 2013 and a contract signed on February 2016.

Karbala refinery date of completion was passed due to, deliberate, lack of funding that caused the delay, but its construction is now over 80%. Missan refinery is still drawings on papers and nothing of substance risen above the ground!!

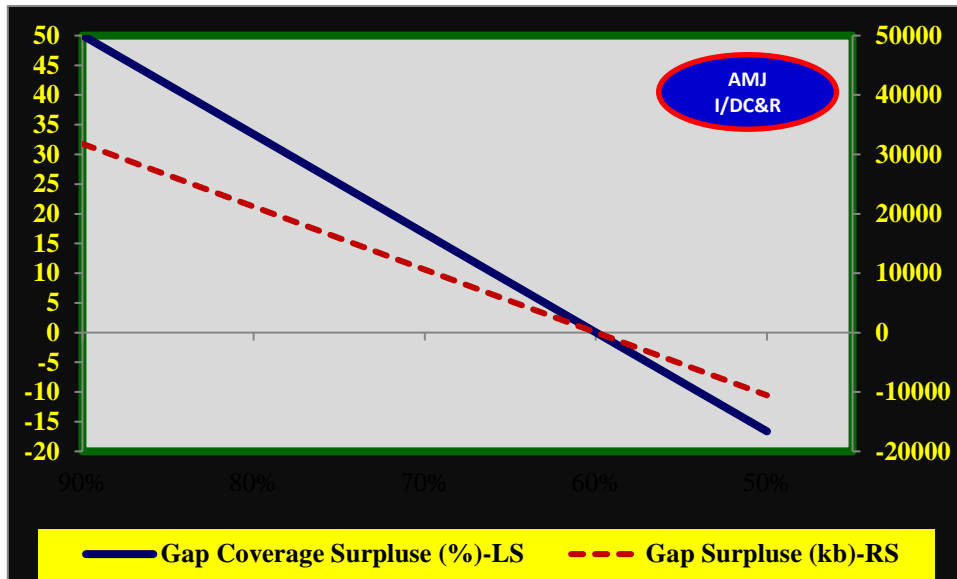
The delay of the two refineries causes the country dearly each year. I estimated the annual impact of none-completion of the two refineries in terms of “cost of opportunity lost” (similar to the known economic term “opportunity cost”), in percentage and actual number of barrels, measured by the coverage of refinery gap for 2016 at capacity utilization ranging between 50% to 90% of the combined designed capacity of both refineries-CDC, as shown in the following chart (4).

The “cost of opportunity lost” would be equal to the “entire refinery gap for 2016” plus 50% of that gap when the operating capacity is 90% of the CDC, and goes down to 83% of the “entire refinery gap for 2016” when operated at 50% of the CDC (the blue solid line, reads on Left Side of the chart).

In barrel terms, the “cost of opportunity lost” is the surplus over refinery gap for 2016 that would mount to 31777kb at 90% of the CDC and would reduce the refinery gap for 2016 by 10563kb at 50% of the CDC (the dotted red line, reads on the Right Side of the chart).

#### **Chart (4)**

#### **Estimated Annual Cost of Opportunity Lost due to None-completion of Karbala and Missan Refineries (% and Kb)**



## Private Investment Illusion-PII

The two above mentioned investment laws offer variety of incentives, privileges and exemptions for refinery private investors, both nationals and foreign.

Despite of all these incentives, the legal framework and government promotional actions that have been operational for almost fifteen years, the result is a complete disappointment.

There seems to be a sense of Private Investment Illusion-PII that impacts the decision and policy makers. Hence, there are dual-capturing effects: state-capture and refinery-capture; the first is manifested by capturing state through preventing it from funding new refineries (e.g., Karbala refinery), and the second is capturing a refinery when that refinery was contracted scandalously to an incompetent investor (e.g., [Satarem-Missan](#) refinery).

Such illusion had actually contributed to delay the completion of the new state-funded Karbala refinery to the extent that a former Oil Minister, Jabbar Luaibi, had called offering that refinery, which was at 70% completion, to private sector. The same illusion kept Satarem contract for Missan refinery, though nothing of substance has been accomplished even after seven years of signing the contract!! The repeated offering of many other new refineries is recurrent manifestation of PII.

Paradoxically, those who advocate privatizing Iraqi refineries call upon the Iraqi government to invest in refineries outside Iraq. [Jabbar Luaibi](#) called the Iraqi government to purchase (in part or full) an old refinery in Morocco. What even more puzzling, he asserts the cost of imported refinery products cost the country between \$3 and \$4 billion annually; that amounts to between 50% and 66% of the entire cost of Karbala refinery! So why did he suspend

funding the refinery during his two years ministerial term? Was it intention or omission or corruption? Who knows!

Recently, the government “[White paper](#)”, articulated by the current Minister of Finance, Dr. Ali Allawi, proposes “gradual transition from state-led to private-led oil and gas sectors” (P. 62), but calling, the state, at the same time to, “forging partnership in refineries outside the country” (P. 63); what inconsistency and lack of understanding of basic development prerequisites!

On similar line of flawed thinking, the prime minister designated-2020, [Mohammed Tawfeq Allawi](#), proposed for the current government a project that involved laying a pipeline from Iraq to Jordan and then to Egypt and constructing two refineries the first in Jordan (100kbd) and the second in Egypt (400kbd); he calls the government to assume the financial arrangement of the project and shoulder half the cost of the two refineries while the pipeline cost would be shared “proportionally”. Strangely enough he asserts that the cost of the project would be recovered in one year only and, on the top of that, it generates net returns that exceed the cost of the entire project and without any contribution from state budget!!!!!!

The most deceptive erroneous idiotic and irrational argument that is repeatedly propagated by the pro private refineries is that private investment costs state budget nothing.

As mentioned earlier the private investors were offered and entitled to have numerous and financially significant incentives, privileges and exemptions such as tax-break, long term land lease at symbolic annual fees, logistical and infrastructural facilities, product off-take agreement (with Take or Pay provision) at international product prices, crude oil price discount among others. All such incentives can be estimated and monetized if and when enough and accurate data are made available; for the time-being they are not. But the most computable upfront among all incentives is oil price discount; and this I address now.

According to the second amendment of Law 64 of 2007 the discount is between two bounds: a minimum of \$5 a barrel and a maximum of \$10 a barrel off the price of oil supplied to the refinery during the contracted period of the private refinery; such discount is, analytically and actually, economically and fiscally, a direct cost to state coffers; it is a foregone state income. To illustrate the cost of this price discount the calculations and data presented in the following table were based on the new [Zubair refinery](#) information recently revealed by the current Minister of Oil: refinery designed capacity of 300kbd; capital cost of \$4 billion. I assumed further a 30 year contract term and actual capacity utilization ranges from 50% to 100% of the designed capacity. The estimated cost of discount was calculated under \$5 and \$10 a barrel thresholds.

### The Economics of Oil Price Discount for Private Investment Refinery

Capacity Utilization	100 %	90 %	80 %	70 %	60 %	50 %
Total (\$5/b)	16,4	14,8	13,2	11,5	9,9	8,2
Total (\$10/b)	32,9	29,6	26,3	23	19,7	16,4
InvRec(Y,\$5/b)	7,3	8,1	9,1	10,4	12,2	14,6
InvRec(Y,\$10/b)	3,7	4,1	4,6	5,2	6,1	7,3
Net Gain (\$5/b)	12,4	10,8	9,2	7,5	5,9	4,2
Net Gain (\$10/b)	28,9	25,6	22,3	19	15,7	12,4
NPV (10%DR;\$5/b)	5,2	4,7	4,1	3,6	3,1	2,6
NPV (10%DR;\$10/b)	10,3	9,3	8,3	7,2	6,2	5,2

The data of the above table reveals the following:

- 1- Total value of the discount at \$5/b during the 30 years of the contract mount to \$16.4 billion when the refinery operates at full capacity, but that total falls to \$8.2 billion at 50% utilization of the nameplate capacity. When the discount is \$10/b the above totals doubles;
- 2- Invested capital would be fully recovered (InvRec), through oil price discount effect only, as short as three years and a half when the refinery operates at full capacity with \$10/b discount and as long as 14.6 years when the refinery operates at 50% utilization and \$5/b discount;
- 3- Hens, Net Gain (after recovering invested capital in full) would range from as high as \$28.9 billion when the refinery operates at full capacity with \$10/b discount and \$4.2 billion when the refinery operates at half capacity utilization with \$5/b discount;
- 4- The private investor would make good money from oil price discount only even when the refinery operates at 50% capacity and with \$5/b discount; what the investor gains under any capacity utilization and discount threshold is, in fact, net cost paid by the national budget;
- 5- The Net Present Value (NPV) of annual amounts generated from price discounts was calculated at 10% discount rate under the two oil price discounts and different capacity utilization rates. This NPV calculation, I must emphasis, is confined to the oil price discount effect only and, thus, should not be taken or interpreted to reflect complete discounted cash flow-DCF or to estimate the Internal Rate of Return-IRR; as the two concepts require much more data and information relating to both streams of costs and revenues during the entire life of the refinery.



## **MoO: keep private investment option; don't remain captive to its illusion**

If the above fiscal rewards, fifteen years of promotion, offering and reoffering did not attract a single serious investor, what is, then, the rationale behind waiting any longer for that investor while Iraq imports annually \$3 billion to \$4 billion of petroleum products to satisfy a growing domestic demand??

While Iraq should keep refinery private investment option open, the country/ MoO should work seriously to resolving refining gaps through:

- 1- Complete the construction of Karbala refinery as soon as possible, preferably within 2021;
- 2- Pursue technological solutions to address the problem of surplus in Fuel oil through installing fluid catalytic cracking- FCC unit in Dorah refinery (after conducting thorough feasibility study considering the rather unjustifiable high capital cost of the recently contracted [FCC](#) to upgrade Basrah refinery);
- 3- Consider utilizing the gas-to-gasoline “[GTG](#)“ technology that has been proven economically feasible in other country; as Iraq flares almost half of its associated gas while imports millions of gasoline barrels annually, as shown in chart (2);
- 4- Abandon, once and for ever, the flawed anti-development proposition that calls for constructing and/or financing refineries outside Iraq;
- 5- MoO should refrain from hasty offering of refineries without conducting FEED, feasibility studies or well-thought plans; the more MoO reoffers new refineries in this way, the less credible it becomes.

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