

# QUESTIONING THE ELECTRICITY PRICE OF PAITON I

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## ABSTRACT

During the final few years of the reign of President Soeharto, the Indonesian bureaucracy caused the state owned electricity company (“PLN”) to contract with Independent Power Producers (“IPPs”) for the production and sale of electric power, for resale to the public at expensive rates. With a 30 year contract duration, the agreed price was 8.478 US cents/kWh (for the years 1- 6), 8.272 cents/kWh (for the years 7-12) and 5.458 (for the years 13-30). After the onset of the economic crisis and the fall of Soeharto, the contracts that were made with IPPs were discovered to be disadvantageous to the Indonesian populace and were therefore reviewed and some were amended. But the new contract terms are still disadvantageous to the people. The buying and selling price is still high and there is neither public accountability nor transparency, as required under the principles of good governance.

The process of information exchange remains clogged up; the process of ensuring the public’s ignorance is maintained. According to information, the more recent agreement reached between the Paiton I conglomerate and PLN calls for a trade price of 4.93 cents USD per kWh plus a debt payment (Arrears/Restructuring Cost) of up to U.S. \$ 4 million per month for 30 years, which payment was not part of the original contract terms and increases the real per kWh cost substantially. It was also agreed to increase the cost of energy purchase (take or pay clause), with an Availability Factor (AF) previously 83%, changed to 85% per year and an extension of the contract duration from 30 to 40 years.

This paper is proposing a win-win pricing solution for the benefit of the investor and to protect the public / consumers interest from a higher electricity rate. Agreement at the price level of 4 US cents /kWh for Paiton I would still provide an extremely adequate payback on investment for the investors. The negotiating team/the Indonesian Government should appeal to investors or other groups related to privately owned electricity investments (e.g., investment donors) that in order to decrease the trade price of electricity, they should be willing to reduce the expected profit and share the pain of the project engendered by the economic crisis by reducing their profit level, e.g., the willingness to reduce loan interest rate.

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## INTRODUCTION

*The truth is found when men are free to pursue it.*

**[Franklin D. Roosevelt]**

From 1992-1996, the US Export-Import Bank (Ex-Im) approved over \$1 billion in financing to Indonesia's Paiton power plant complex, despite clear evidence of being one of the world's most expensive and corrupt power projects. The deal, which involved the building of 1, 230 MW of coal-fired power, illustrates the degree of corruption and political heavy-handedness often implicit in Ex-Im ventures, the cost of which is incurred by US taxpayers and, more specifically in this case, the people of Indonesia.

With no competitive bidding, Mission Energy-General Electric won one of the richest private power contracts of the 1990s, thanks to the corporation's relationship to a relative of Mr. Suharto. This relative, who received shares in the project essentially free, was able to get "Mr. Suharto himself to weigh in favor of Mission-GE at a key juncture in price negotiations."

According to declassified documents from as early as 1994, the US Commerce Department was aware that the deal was ridden with bribes and kickbacks for Suharto's family and his political cronies. For example, the documents state that Suharto's daughter, Siti Heditati Prabowo, received 0.75 percent ownership in the deal, at no cost, while splitting a \$50 million bribe with other relatives. The document further states that, due to such corruption, the project encountered difficulties with financing, in particular from the Asian Development Bank (ADB)[1].

Nonetheless, high level US officials, including former Vice President Dan Quayle, then President Bill Clinton, Commerce Secretary Ron Brown, Treasury Secretary Robert Rubin, State Department Secretary Warren Christopher, and Henry Kissinger promoted the deal, and even sought US-backed financial aid for the project through Ex-Im and OPIC, the other US export credit agency.

The result of such intense political maneuvering was an overpriced, uncompetitive project with devastating environmental and social consequences. Mission-GE local partners well-connected to Suharto ordered PLN to utilize coal from one of its mines, charging 30-40 percent more than the going rate for coal. The government ordered Mission-GE to buy boilers for the plant, adding \$20 million in unnecessary costs, from ABB Combustion Engineering, whose state-owned affiliate was connected to the Suharto family. Most alarmingly, Mission-GE insisted that PLN pay an electricity tariff 32 percent higher than comparable tariffs in Indonesia.[1]. An independent audit by the Indonesian government issued last December found that engineering, procurement and construction costs of Paiton power plant were inflated some 72 percent [10] According to Djiteng Marsudi, the CEO of Indonesia PLN, "the US power companies dictated terms to us because they had Indonesia's first family behind them." [1].

Indonesia's economic breakdown resulted in huge losses for the country's high stakes power deals. PLN told Mission-GE that it would not buy any electricity from the consortium's 1,230 MW plant, when it is to come on-line. A lawsuit ensued. After severe arm-twisting from the US government, in which the US threatened that failure to honor contracts such as Paiton would harm new foreign investment and delay Indonesia's recovery, Indonesia pulled the lawsuit[1] An interim deal has been reached to reduce Paiton's rates from the extremely expensive 7.9 cents per kilowatt hour to a more manageable level.[1]. PLN now has about 50 percent more energy capacity than it needs on the main grid, but will nonetheless owe approximately \$1 billion a year just to Paiton I and II.[1].

In the wake of the Indonesian economic crisis of 1997/1998, on the insistence of the IMF, the Indonesian government issued regulation, on suspending a number of infrastructure projects, including the Kraha Bodas geothermal power project. On April 30, 1998, Kraha Bodas Company (KBC, established by several United States companies together with an Indonesian Company owned by the son of a former Vice President of Indonesia), served notice of arbitration in Geneva, under the dispute settlement provision of contracts. It asked for the contracts to be terminated and sought damages of US\$ 96 million for investment thus far made and for \$512.5 million (or \$437 million under an alternative calculation) for the present value of the expected future profits over thirty years of contracts. After hearings, challenges, and preliminary awards, the arbitrators ruled on December 18, 2000, that Pertamina and PLN had breached the agreements with KBC, were "condemned" to pay US\$ 111.1 million for "lost expenditures" (some interest had been added to the requested figure) and US\$ 150 million for "loss of profit". The award added interest until the sums were paid, and assessed on the Indonesian parties the cost of the arbitration. [2].

## MELODRAMA OF KARAH BODAS [7]

**Driving down a very bumpy road you unexpectedly hit a chicken and it is killed. The farmer comes out and you apologized and offer to pay him for the chicken. But he says the chicken might have lived for 5 or 6 years, could have laid an egg every day, half of which could have become other chickens which could have laid more eggs and so on. So he wants a million dollars compensation.**

**That's exactly what the arbitral tribunals did with those two Independent Power Producers. They gave them 42 years of profits for projects for which they had invested, at best, about 10% of what they might have done had all been well, and which may not have had the reserves they claimed, and for which they are unlikely to have been able to get more financing. So those projects may not have been very commercial, which may well be why they took the route of trying to get their money out without having to work the project at all. So the Indonesian taxpayers are supposed to reward these corrupt Americans for their own bad conduct. It really infuriates us. But what can we do about it?**

Meanwhile, according to information compiled within the society of electricity experts, the more recent agreement reached by Paiton I and PLN calls for a trade price of 4.93 cents USD per kWh. This figure consists of: capital cost of 3.53 cents, fuel cost of 1.0 cents; operational and maintenance costs (O&M) of 0.3 cents; and an O&M variable of 0.1 cent/kWh). It also includes debt payment (Arrears/Restructuring Cost) of up to U.S. \$ 4 million per month for 30 years. It was also agreed to increase the cost of energy purchase (take or pay clause), with an Availability Factor (AF) previously 83%, changed to 85% per year and an extension of the contract duration from 30 to 40 years.

Referring to the above-mentioned agreement, debt payment as much as 4 million per month for as long as 30 years will raise the price by an additional 0.52 cents USD per kWh. This means that the price of the Paiton electricity is actually 5.45 cents USD per kWh (4.93+0.52). But in fact, PT PLN will pay a price higher than 5.45 cents USD per kWh because the sum of AF 85% each year for 40 years in practice is hard to achieve. This author is of the opinion that a figure of 70% each year is a more suitable AF to be used as a reference for planning. If a 70% AF is achieved, the trade price of electricity could be as much as 6.62 cents per kWh ( $= 0.85/0.70 \times 5.45$ ).

It should be noted that PLN's Profit and Loss Balance Statistics for 2000 show that PLN experienced loss of as much as 4,659 trillion Rupiah due to the purchase of this highly expensive electricity from the IPPs, i.e. 12.22 cents USD/kWh because the actual use of electricity has been far beneath the take or pay clause, (AF) 83%/year. If the buying price were no more than 4 cents, PLN would not have experienced any loss in the year 2000.

Besides this, the take or pay clause will cause additional losses for the buyer, in this case PT PLN, because they can not optimally control the load dispatching management based on the merit order of their generator. PLN is forced to reduce the use of generators with less expensive fuel in order to be able to reach the 85% AF obligation outlined by the Paiton I agreement.

## **WHAT IS ODD IN THE PAITON I NEGOTIATION**

The discussion below describes how expensive is the trade price of the Paiton I agreement, from an estimation view:

1. cost of generation per unit of US cents/kWh;
2. benefit/cost ratio, this means the ratio between the income and total fund invested by investors
3. the length of the payback period for the capital invested.

Because the estimation above is related to the amount of investment needed to fund the development of the project, a number of points need first to be clarified:

- The private electric company Paiton I [Engineering Procurement Construction (EPC)] stated that the total project cost claimed for Paiton I is U.S. \$ 2,500,000,000.00 (2.5 billion United States Dollars).
- Responding to this surprisingly expensive project development cost, in year 1999 PLN assigned a consultant, SNC Lavalin from Canada, to audit the projection costs of the EPC (Engineering, Procurement, Construction). Lavalin reported an estimated cost of \$ 1,033,000,000,00, with a maximal estimation error level of 20%. This is less than half of Paiton’s reported costs.
- The Total Project Cost consists of: EPC cost, Development Cost (all the service cost which support project development); Initial Working Capital and Financial Cost (Interest During Construction, Bank Fee, Cost Of Debt Services). It was estimated that the total project cost is approximately 25%-30% above the EPC Cost.
- By referring to the EPC cost estimate, which is U.S. \$ 1,033,000,000.00 to US \$ 1,239,600,000.00 (\$ 1.033 billion x 1.20) , if we add an additional estimation of 25%-30% above the EPC cost, we will get a Total Project Cost in a minimum amount of US. \$ 1,291,250,000,00 (=1033 x 1.25) up to a maximum of U.S. \$ 1,611,480.000.00 (=1239.6 x 1.30) million USD.
- It should be noted that the estimate cost of this project development is between 19.6% and 49.2% above the estimated cost of the Coal-Fired Steam Power Plant Suralaya of 3 units @ 600 MW development which amounts to U.S. \$ 1,080,000,000.00 [3].

### **I. Price Estimation U.S. cents: unit/kWh**

Based on research, the author found that the reasonable trade price of Paiton I is 3.21-3.64 cents USD/kWh (without tax) with the following details:

• Component A (element of payback period of investment)	1.75 - 2.18 U.S. cents
• Component B (element of fixed costs for operations and maintenance)	0.40 – 0,40 U.S. cents
• Component C (element of fuel cost)	1.01- 1,01 U.S. cents
• Component D (element of variable cost for operations and maintenance)	<u>0.05 – 0.05 U.S. cents +</u>
Total cost of generation [US cents/kWh]	3.21 – 3.64 U.S. cents

The calculation of the generation cost is based on the following assumptions:

- Development cost of U.S. \$ 1,291,250,000 and \$ 1,611,480,000.
- Composition of capital: loan 72.8% (interest rate: 9.50%/a) and equity 28.2% (ROE rate= 18.03%/a). This means the project ROR rate is 12%/a (=  $0.728 \times 9.5\% + 0.282 \times 18.03\%/a$ ); or when the rate 8.5%/a is used, the dividend level is 20.6%/a. A return consisting of interest rate and ROE that are quite appropriate for the investors of Paiton I.
- The price of coal, U.S.\$ 22.0 /ton.
- Operational and Maintenance cost beyond PLN's estimation.
- The calculation above does not include 30% tax on capital cost.

Based on what is elaborated above (information from Malaysia, Vietnam, and Indonesia-Suralaya Coal- Fired Power Plan, World Bank's evaluation and the author's estimation), to indicate that the Paiton I privately owned electricity trade price agreement is successful, the price level achieved should be under 4 U.S. cents per kWh.[3,4,5] .

## **II. Benefit/Cost Estimation Ratio**

Discussing the trade price of electricity in U.S cents/kWh makes the actual big money transaction involved sound rather small. With the price agreement of 4.93 cents /kWh, after reducing 1.0 cent /kWh cost of fuel element and 0.4 cents /kWh operational and maintenance cost (these three costs are considered operation and maintenance costs that are passed through to the buyer), payback on investment element is 3.53 cents /kWh. Referring to the capacity installed, 2 units of 615 MW each, and AF of 85%/year, the revenue from electricity sold comes to as much as U.S. \$ 9,158,580,000.00 per kWh per year. This will present to the seller a gross income of U.S. \$ 323,300,000.00 /year (=  $3.53/100 \times 9,158,580,000$ ).

By applying a 10% discount rate/year (as used by the PLN) and a contract duration of 40 years, the net present worth value (NPWV) of electricity trade income is U.S. \$ 3,161,500,000.00 (=  $323.30 \times 9,779,051$ , the last present worth annuity factor). After adding arrears of as much as 4 million USD/month for 30 years, with a NPWV as much as 452.5 million USD, the gross income of the investors is U.S. \$ 3,614,000,000 (=  $3161,5 + 452,5$ ). After reducing this income by the 30% tax, the investor's net income (NPWV) becomes U.S. \$ 2,529,800,000.00, a sum that is close to the total claimed project cost of Paiton I, which is 2.5 billion USD.

## **III. Payback Period**

Another way of looking at the cost of private owned electricity is by observing the duration agreed upon for the payback period of investment by calculating the ratio

between capital investment cost and the fixed charge on capital cost (Capacity Charge, referred to as Component Cost A).

### *The Previous Contract*

The Total Claimed Project Cost was 2.5 billion U.S. dollars for capacity installment of 2 x 615 MW. This means that the capital investment cost is U.S. \$ 2,032.50 /kW. The price of Capacity Charge is \$ 536.10 /kW-year (for the first six years of operation), \$ 518.10 /kW-year (for the next 6 years) and U.S. \$ 271.60 /kW-year (for the next 18 years, until the end of the 30 year contract). Therefore, the duration of the payback period is only 3.79 years ( $= 2032.5 : 536.1$ ), a relatively short period compared to the 30 year long contract. If we use the maximum capital investment estimation from Lavalin Consultant, which is U.S. \$ 1,208,650,000 and \$ 1,450,380,000 , or US \$ 982.64 and \$ 1,179. /kW, the payback period will be between 1.83 and 2.2 years ( $= 982.64 : 536.1 - 1,179.17 : 536.1$ ).

### *The Last Agreement*

According to information on the new agreement, the amount of the Capacity Charge is now US \$ 323,300,000 /year at an Availability Factor (AF) level of 85% and a contract duration of 40 years. This might be interpreted as Capacity Charge in the amount of US \$ 262.85 /kW/year ( $= 323.3 \text{ million USD/year} : 1230,000 \text{ kW}$ ) at an 85% AF or 309,23 USD/kW/year ( $= 262.85 \times 100/85$ ) at an AF of 100 %., which is equal to the value of 3.53 cents /kWh [ $= 309.23 \text{ USD/kW.year} : 8,760 \text{ h/year}$  or  $= 262.85/(8760/0.65)$ ]. In addition, a 4 million USD/month debt payment for 30 years. Therefore the total Capacity Charge is 348.25 USD/kW-year ( $= 309.23 + 4,000,000 \times 12/1230,000$ ).

This means that the payback period is 5.84 years ( $= 2032.5/348.25$  to the investment cost stated by the Paiton I) for a contract duration of 40 years. If the maximal Lavalin investment capital estimation is used, the payback period will be between 3.71 years ( $= 1291,25/348,25$ ) and 4.63 years ( $= 1611,48/348,25$ ). By using a discount rate of 12%/year, Paiton's payback is 10.3 years (to fulfill the total claimed project cost of Paiton I) and between 5.2 to 7.2 years of payback period, referring to the EPC Lavalin estimation cost (after adding other development costs)[6]. The estimation of the 5.2 - 7.2 years payback period for a 40 year contract shows how the last Paiton I trade price agreement is still too expensive when compared to the Malaysia and Vietnam trade price agreement described above.

The take or pay clause to ensure payback of capital to investors should not be connected to electric power production (AF). If so, it will disadvantage the buyer. The investor's payback is taken from the fixed charge on capital cost, which has no relation to the amount of kWh (AF) produced. The objective of welcoming private owned electricity investment is more related to efforts to supply installed capacity. For this investment, the owners need to be assured that their investment will yield a payback appropriately based on reasonable and decent business principles.

## WHO PROFITS ?

### I. For the price level of 4 cents USD/kWh

Based on what was elaborated above, the author will begin this section with a question: Can the trade price of Paiton I electricity in the amount of 4 U.S. cents /kWh still provide an adequate income to pay back the investment?

The electricity trade price of 4.0 U.S. cents /kWh, consists of: coal cost up to 1.0 cent /kWh, operational and maintenance costs (e.g., staff salaries and spare parts purchase) up to 0.4 cents/kWh, for the seller, an investment payback of up to 2.6 cents /kWh, and includes the 30% tax, equivalent to 0.6 cents /kWh. Therefore, there is a net income of 2.0 cents/kWh for investors as investment payback.

The SNC Lavalin has estimated the Paiton I EPC cost as much as U.S. \$ 1,033,000,000.00, with a probability of a 20% maximal error level [6]. As elaborated above, the Total Project Cost is 25% - 30% above the EPC cost. Therefore, the minimal estimation of the Total Project Cost of Paiton I is U.S. \$ 1,291,250,000.00 (= 1.033 billion x 1.25) up to the maximum estimation of U.S. \$ 1,611,480,000.00 (= 1,033 billion x 1.20 x 1.35).

The energy production generated by Paiton I is calculated as follows:

$$\begin{aligned} &= 1,230,000 \text{ [kW]} \times 8,760 \text{ [ h/year]} \times 0.85 \text{ (Availability Factor = Capacity Factor)} \\ &= 9,158,580,000 \text{ [ 9.15858 billion kWh/year]}. \end{aligned}$$

This means that what PLN pays for investment payback each year is as much as:

$$\begin{aligned} &= 9.15858 \text{ [billion kWh/year]} \times 2.6 / 100 \text{ [USD/kWh]} \\ &= 238.12 \text{ [million USD/year]} \\ &\text{or for 40 years as much as U.S. \$ 9,524,920,000.00 [ 9.52492 billion USD]}. \end{aligned}$$

Meanwhile the net income (after deducting tax) for investment payback for investors each year is:

$$\begin{aligned} &= 9,158,580,000 \text{ [9.15858 billion kWh] /year} \times 2/100 \text{ [ USD/kWh]} \\ &= \text{U.S. \$ 183,170,000.00 [183.17 million USD] per year.} \end{aligned}$$

So the net income for forty years is:

$$\begin{aligned} &= 183.17 \text{ [million USD/year]} \times 40 \text{ [year]} \\ &= \$ 7,326,800,000.00 \text{ [7.3268 billion USD] (at a discount level of 0%/year)}. \end{aligned}$$



If an 8% to 14% discount rate/year is used, we will find the Net Present Value (NPV) to be as follows:

<b>Discount rate [%/year]</b>	<b>Present Worth Annuity Factor (PWAF) for 40 years.*)</b>	<b>Income Net Present Worth Value [Billion USD/year]</b>
0	40	7.32680
8	11.924613	2.18425
10	9.779051	1.79123
12	8.243777	1.51001
14	7.105041	1.30143

Note: PWAF is calculated by using the formula:  $\{ 1 - 1 / (1 + i)^n \} / i$

Where i = discount rate n = duration of contract

Based upon the above description, we can see that the 4 cents/kWh electricity price which provides a 2 cents/kWh investment payback will result in a net income from the Paiton I over 40 years of as much as 7.326 80 billion USD, with an investment estimation between 1.29125 and 1.61148 billion USD. This means:

For an investment of 1.29125 billion US dollars,

The Rate of Return (ROR) obtained is:

$$= (1,301,430,000 / 1,291,250,000 \times 14\%)$$

$$= 14.11 \text{ [%/year]}..$$

For an investment of 1.61148 [billion USD],

The Rate of Return (ROR) obtained is:

$$= (1,510,010,000 / 1,611,480,000 \times 12\%)$$

$$= 11.24 \text{ [%/year]}.$$

Therefore, at the price level of 4 cents USD/kWh and investment estimation between 1.29125 up to 1.61148 billion USD, the net income obtained after 40 years is 7.32680 billion USD. In other words, investment increases with the increase of the rate of return (ROR) between 11.24 and 14.11% per year. As a comparison, in the state of Victoria (Australia), the electricity ROR level permitted is 9.6%/year.

## **II. For the Price Level of 4.93 US cents/kWh, plus arrears**

If, as shown above, the price of 4 cents USD/kWh is still sufficiently profitable to Paiton I, then what would be Paiton I's income at the price level of 4.93 cents/kWh? The author assumes that the basic payback at 3.53 cents USD/kWh. Therefore the trade price of 4.93 cents/kWh consists of the following costs:

- A. Payback of investment at 3.53 cents/kWh,
- B. Fixed O&M Costs of 0.3 cents/kWh;
- C. Fuel Cost of 1.0 cent/kWh; and
- D. Variable O&M Costs of 0.1 cent/kWh

After the 30% tax, i.e., as much as 0.815 cents/kWh, the net income for investment payback is:

$$\begin{aligned} &= (3.53 - 0.815) \\ &= 2.715 \text{ cents/kWh.} \end{aligned}$$

By referring to the amount of electric power generated (9.15858 billion kWh/year), the net income of Paiton I will be:

$$\begin{aligned} &= (2.715/100 \text{ USD/kWh} \times 9,158,580,000 \text{ kWh/year}) \\ &= \text{U.S. \$ } 248,655,447.00 \text{ per year.} \end{aligned}$$

This will result in a net income throughout the 40 year contract in the amount of:

$$\begin{aligned} &= (40 \text{ years} \times \$ 248,655,447.00 \text{ /year}) \\ &= \text{U.S. \$ } 9,946,217,880.00. \end{aligned}$$

Furthermore, there is an additional income from debt re-payment as high as 4 million USD/month

$$\begin{aligned} &= (4 \text{ million USD/month} \times 30 \text{ years} \times 12 \text{ month/year}) \\ &= \text{U.S. \$ } 1,440,000,000.00. \end{aligned}$$

After deducting the 30% tax, the total net income of debt paid is:

$$= (1.440/1.30) = 1.10769 \text{ [billion USD]}$$

With the last Paiton I trade price agreement with PLN, the Paiton I net income is

$$\begin{aligned} &= (9.94622 + 1.10769) \\ &= 11.05391 \text{ [billion USD]}. \end{aligned}$$

So the difference between the trade price agreed based on approach A (4.93 cents +debt payment) and the trade price limitation of up to 4 cents/kWh is:

$$\begin{aligned} &= (11.05391 - 7.32686) \\ &= \text{US \$ } 3.72705 \text{ [billion USD]}. \end{aligned}$$

By referring to the information on payback of investment in the amount of 3.53 cents USD/kWh at an Availability Factor (AF) of 85%, this means that the amount of investment payback to be paid each year (with the assumption that the 85% AF is equal to 85% Capacity Factor (CF)), is:

$$\begin{aligned} &= 1,230,000 \text{ [kW]} \times 8,760 \text{ [h/million]} \times 0.85 \times 3.53 \text{ [US cents /kWh]} \\ &= \text{U.S. \$ } 323.3 \text{ million /year}. \end{aligned}$$

Because the previous contract states that the payback of the investment A component is a fixed charge in USD/kW/year, should we not seriously question the amount of this payback of investment A in the new contract?.

## **TAX AND CAPITAL OUTFLOW**

As described above, from each electricity trade at the 4 cent/kWh level, the government will obtain income from tax of up to 0.6 U.S. /kWh. This means that for generating electric power of as much as 9,158,580,000 [9.15858 billion kWh/year], the government will obtain income from tax of 54.95 million USD/year, or as much as 2.1986 billion USD over the 40 year duration of the Paiton I contract.

In the context of funding the electricity development sector based on equity, the tax figure above is quite a large sum to pay back to the people, particularly for those belonging to the lower economic level, particularly considering that half the population of Indonesia still has no access to electricity. This means that the capital outflow is:

$$\begin{aligned} &= \text{U.S. \$ } 9,524,920,000.00 - 2,198,060,000.00 \\ &= \text{U.S. \$ } 7,326,860,000.00 \text{ [7.32686 billion USD]}. \end{aligned}$$

Meanwhile, the trade price agreement between Paiton I and PLN is at 4.93 cents/kWh, therefore the income the government obtains from tax, is:

$$\begin{aligned}
 &= (0.815 \text{ cents/kWh} \times 9.15858 \text{ billion kWh /year} \times 40 \text{ years}) \\
 &\quad + (1440 - 1440 \text{ million USD} / 1.30) \\
 &= \text{U.S. \$ } 3,318,000,000.00 \text{ [3.318 billion USD]}
 \end{aligned}$$

Therefore, the capital outflow paid to other countries, is:

$$\begin{aligned}
 &= \text{U.S. \$ } 14,371,910,000.00 - 3,318,000,000.00 \\
 &= \text{U.S. \$ } 11,053,910,000.00 \text{ [ 11.05391 billion USD]}.
 \end{aligned}$$

The table below provides an illustration on how much PLN has to pay as a buyer, the government's income from tax and the net income to the Paiton I investors, just from the payback on investment (A component). PLN's expenditure is even bigger because it has to pay operational and maintenance costs (cost elements B and D) and also the cost of using coal (cost element C).

	<b>At the Price Level Agreement</b>		<b>The difference of the two price levels</b>
	<b>4.0 [cents/kWh]</b>	<b>4.93 [cents/kWh]</b>	
PLN's Payment [million USD]	9,524.92	14,371.91	4,846.99
Government tax income [million USD]	2,198.06	3,318.00	1,119.94
Private owned Paiton I's income [million USD]	7,326.86	11,053.91	3,727.05

Of course the Department of Finance of the Republic of Indonesia will not issue a decision that will give consent to a more expensive electricity price for the sake of receiving more income from tax, even though this policy would result in a greater loss for the state and the consumers.

## CONCLUSION AND RECOMMENDATION

1. By observing the price unit cost in cents/kWh, the benefit/cost ratio and the payback period, it is obvious that the new electricity trade price agreement of Paiton I, which is as much as 4.93 U.S. cents /kWh plus: payment of arrears (restructuring cost) of as much as 4 million USD per month for 30 years; and the increase of contract duration from 30 years to 40 years; and the AF increase from 83% to 85%, is an expensive agreement and should be rejected. This agreement is clearly more expensive than a similar contract in Malaysia (3.2 cents/kWh) [4], Vietnam (4.20 cents/kWh) [5] and past experience of electricity generation costs in Indonesia, such as the Suralaya Coal- Fired Power Plan (3.7 cents/kWh) [3]. The agreement at the price level of 4 US cents /kWh for Paiton I would still provide an extremely adequate payback on investment for the investors. The negotiating team/the Indonesian Government should appeal to investors/or other groups related to private owned electricity investment (e.g., investment donors) that in order to decrease the trade price of electricity, they should be willing to reduce the expected profit and share the pain of the project engendered by the economic crisis by reducing their profit level, e.g., the willingness to reduce loan interest rate.
2. The main difference between the author's estimation and the result of the negotiation of the agreement is on the payback of investment element, as shown below:

<b>Cost Components</b>	<b>Negotiation Result (U.S. cents /kWh)</b>	<b>Author's Estimation (U.S. cents /kWh)</b>
A. Payback of Investment	3.53	1.75 – 2.18
B. Fixed O&M Cost	0.3	0.4
C. Fuel Cost	1.0	1.01
D. Variable O&M Cost	0.1	0.05
<b>Total Cost</b>	<b>4.93</b>	<b>3.21 – 3.64</b>

The difference of cost component A is not caused by a different rate of return, but mainly due to difference in project development cost being claimed by Paiton I, which is 2.5 billion USD. This is a very different sum from that audited by the Lavalin Consultants with an EPC cost estimation [6] as much as 1.033 billion USD, with a maximal level of estimation error of 20%. After adding other costs of up to 25% - 30% above the EPC Cost, the estimation of project development cost is between 1.29125 and 1.61148 billion USD. It should be noted that this estimation is 19.5% to 49.2% above the Suralaya Coal-Fired Power Plan (3 x @600MW) development cost, which is as much as 1.080

billion USD. Therefore we should reject using the project cost 2.5 billion USD as a basis of estimating trade price. And it should be re-audited.

3. During the new order, the bureaucracy (the government and PLN) together with the Independent Power Producers (national and foreign) had entered into certain contracts for the production, purchase and sale of expensive electric power, for ultimate sale to the public, without their approval. As time passes and where there is more access to information in the reformation stage, as a nation and government we should be more careful in our efforts to finalize Power Purchase Agreements with IPPs.
4. Expensive price of electricity trade is not normal, and an unfair contract would disadvantage the public should be resolved based on the principles of justice. This fairness can be controllably achieved through political good will and good governance based on reasonable and fair business principles.
5. This is why there must be clear negotiation strategies to achieve agreements in the electric power trade. The reference used to estimate project cost, ROR level, the price of coal and the sum of energy bought, should be appropriate and suitable.
6. Furthermore, because electricity trade is related to the public interest, it should be transparent and accountable, and even needs to obtain the public's approval.
7. Success in finalizing the Paiton I contract will become a reference for the finalization of other contracts with IPPs.

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Jakarta, 13 May 2003.

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