



Green Sukuk for Financing Renewable Energy Projects

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Abstract: This paper investigates the use of the green sukuk, particularly, for financing the renewable energy projects. More precisely, three case studies have been chosen for discussion. In the first case study, we highlight “Hybrid Sukuk” framework adopted by Tadau Energy Sdn. Bhd. for financing solar photovoltaic (PV) plants. The second case study, we reviewed “Sukuk Wakalah” issued by BEWG (M) Sdn. Bhd., as an ideal solution for water treatment project. Finally, for the third case study, we have discussed in detail about “Sukuk Murabahah” which is being used by Sarawak Hidro Sdn. Bhd. for financing the hydroelectric plant (BAKUN hydroelectric project).

Keywords: Green Sukuk, Renewable Energy, Financing

JEL Codes: G21, Z12

Introduction

Sukuk in Arabic is the plural of “*sakk*” that refers to a certificate of ownership of an asset. The Accounting and Auditing Organization for Islamic Finance Institutions (AAOIFI) defines “sukuk” as the certificates of equal value representing undivided shares related to the ownership of the assets of particular projects or a special investment activity, extending even to contractual right held in trust for sukuk holders. It is important to note that, the issuance of green sukuk is designed to finance sustainable, climate-resilient growth and environmental-friendly projects. The growing trend in adopting green sukuk has not only been supported by the natural progression of sukuk market, but it is also in line with the increasing in-

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vestor awareness on ethical and social responsible investments and is a solution for the stringent capital requirements in funding the infrastructural projects.

The concept of green sukuk has received increasing attention lately. Green sukuk are directly related to the climate change, global warming and other environmental issues. Massive investment of green sukuk is needed throughout the world to finance green energy project. During the United Nations Global Warming Conference (COP21) held in Paris, the Islamic Development Bank (IDB) had revealed its interest in issuing green sukuk for its 56 member countries. Currently, IDB has funded USD\$ 180 million pilot projects to fund clean energy project. In 2018, IDB disclosed its aim to double its funds for renewable energy from USD\$ 80 billion to USD\$ 150 billion, during the years 2016 and 2030. The benefits of these projects can be measured by the reduction in the amount of carbon dioxide (CO₂) emissions.

Recently, Malaysia's energy sector required renewable energy to cope with the challenge of depletion of fossil fuels. It is also expected that this renewable energy will help in meeting the Malaysia's growing energy demands. Furthermore, the Green Technology Master Plan (2017-2030), outlines the strategic plans for green technology development action plan. The plan is also used to support the National Green Technology Policy. The aim of this master plan is to create a low carbon and resource efficient economy. According to Datuk Seri Maximus Johnnity Ongkili, Green Technology Master Plan (GTMP) is positioned to generate more than 200,000 green jobs and a targeted revenue of RM 180 billion. Moving forward, by 2030 green business will contribute as 1.5% to the country gross domestic product.

Our main concern here is to understand the green sukuk. Figure 1 describes the process flow of the green sukuk structure. Sukuk issuer ought to raise the necessary funds to finance any environmental-friendly project. In such a case, sukuk issuer is responsible to generate returns for the green sukuk holder whereas the obligators shall be responsible for purchase undertaking of the asset at a maturity date (Alam, Duygun & Ariss, 2016).

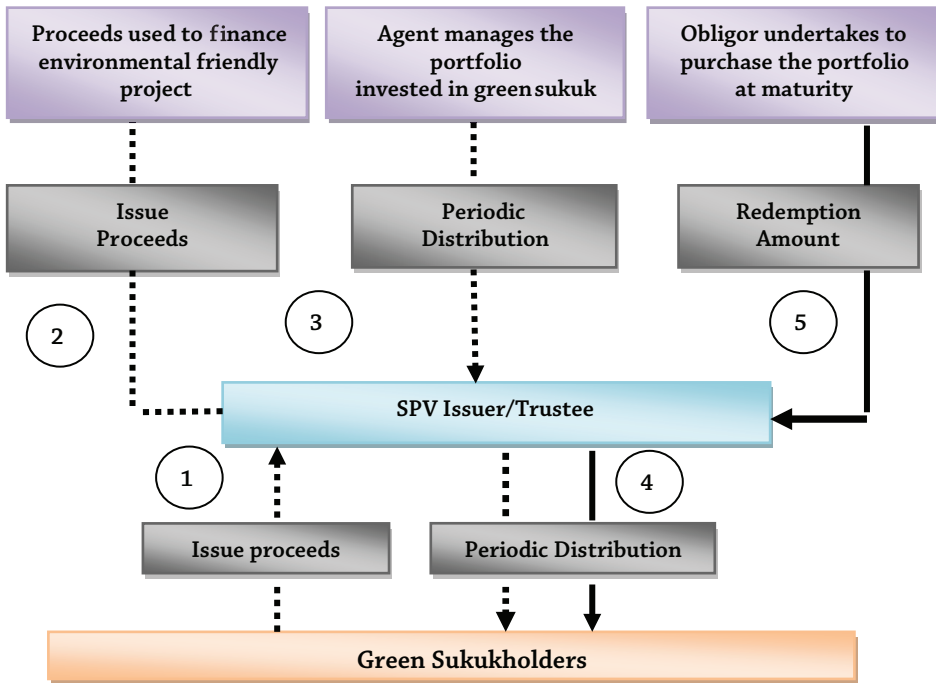


Figure 1: Green Sukuk Structure

The remainder of this paper is organized as follow; Section 2 provides an overview of green sukuk. Section 3, 4 and 5 examine three different case studies respectively. In this specific context, green sukuk have been implemented for the solar photovoltaic (PV), water treatment and BAKUN hydroelectric plant project. These three case studies depend upon the hybrid sukuk, sukuk wakalah and sukuk murabahah. Finally, Section 5 summarizes our main findings.

Green Sukuk Development

The growth of green sukuk in Malaysia is in line with the Securities Commission Malaysia's (SC) vision and objectives. The "SRI Sukuk Framework" was launched by the Securities Commission in 2014 to facilitate the financing of SRI projects. In fact, the introduction of the SRI sukuk framework is part of the SC's developmental agenda. The first green sukuk was issued by the Khazanah Nasional Berhad in June 2015. At that time, the size of the issuance was relatively small, which was priced at RM 100 million for only seven-years. However, the nominal periodic distribution rate has been 4.30% per annum.

In the latest development, Quantum Solar Park Sdn Bhd was issued green sukuk up to RM 1 billion. The proceeds will be used to build three 50MW solar photovoltaic (PV) plants in Gurun, Kedah, Jasin, Melaka, and Merchang, Terengganu. The total project cost of about RM 1.24 billion will be funded according to an 80:20 sukuk-to-equity financing basis.

The trend in the global green sukuk is encouraging. Outside Malaysia, in Oman, for example, Mazoon Electricity Company raised \$500 million debut from sukuk issuance. The 10 year sukuk offering was built via an intra-day execution process, at the profit rate of 5.20%. The issuance will support the group in electricity transmission and distribution networks investment. Another interesting point to note is that this issuance is rated BAA2 by Moody's and BBB by Fitch.

Earlier, the first green sukuk were issued in 2012 by Legendre Patrimoine and Anouar Hassoune Conseil known as the "Orasis Sukuk". The proceeds from the Orasis sukuk shall be utilized for financing solar plants project. The financing project offers 7% return per annum for every second quarter. Likewise, investors will enjoy a tax cut of about 71% over the 10 years period.

However, financing is a critical component. Renewable energy projects often require substantial amounts of money. Funds must be secured in order to move ahead to the various phases of such large-scale projects. This involves the steps from planning to purchasing and installing the equipment. When a firm invests, it must have a qualified manager as well as expert staff hired for the operation and maintenance of the systems installed. Again, financing activities are one of the largest barriers to the development of sustainable energy.

A new dimension brought by the green sukuk is that it is seen as a potential financier for the renewable energy. The aim of this article is to discuss how different types of green sukuk have been applied within the Malaysian context. Thus, below are three case studies that demonstrate how green sukuk works as a financier for the renewable energy projects. The selection of case studies was based on the most recent application of green sukuk within the last three years.

Tadau Energy Sdn. Bhd. (Solar Photovoltaic)

The first case study reveals the practices of Tadau Energy Sdn. Bhd. herein mentioned as Tadau Energy. On 27th July 2017, Tadau Energy issued RM 250 million sukuk under SRI Sukuk Framework (Mujahid & Ali, 2016). This project would take 10 year to complete. Tadau Energy will use the proceeds to finance the construction of 50 MW ac solar photovoltaic (PV) in Kudat, Sabah. Tadau Energy is undertaking

two 21 year power purchase agreements with Sabah Electricity Sdn. Bhd. Moreover, Tadau Energy is responsible to finance, design, install, test and operate the solar photovoltaic (PV) plants. The first sukuk redemption value amounted to RM 14,000,000.00 which will be paid in the 2nd year of the project.

The project is classified as “Asset 1” under Power Purchase Agreement (PPA 1) referred as “Site Yong East.” The PPA 1 agreement was signed on 12 December 2016 between Tadau Energy (sukuk issuer) and Sabah Electricity Sdn. Bhd. (SESB). This plant is estimated to generate 2 MW ac solar photovoltaic (PV) energy and is located in Jalan Sikuati, Kudat, Sabah. The cash on delivery (COD) of “Asset 1” was scheduled for 30th June 2017. “Asset 2”, under Power Purchase Agreement (PPA 2) refers to “Site Yong East, Site Bak Bak and Site Yong West.” The scheduled cash on delivery (COD) of “Asset 2” was signed on 31st March 2018.

Application of Hybrid Sukuk

“Hybrid sukuk” basically can be understood as “a type of sukuk whose structure consists of two underlying contracts or more where both equity and debt elements do exist. Tadau Energy acts as an issuer. Investors who are the sukuk holders refer to the sukuk subscribers at the time of offer or buyers of sukuk from the secondary market. Figure 2 and Figure 3 illustrates the applications of “hybrid sukuk”. Subsequently, we shall discuss some aspects of hybrid sukuk as a financing mode.

There are two different phases of “hybrid sukuk” (i) at inception and during construction of assets and (ii) post-completion of the assets and at the maturity date. *Al-istisna’* agreement is used at the both stages. *Al-istisna’* agreement was basically offered for infrastructural and development projects which required advance payment of funds, in full or in installments, for the construction of assets and are non-tradable.

Meanwhile, *al-ijarah* agreement is applied for sale and lease-back structure and as payments supported by the lease rentals. Furthermore, this *al-ijarah* agreement is divided into purchase agreement, lease agreement, service agreement and purchase undertaking. However, in this case, Tadau Energy opted to the *ijarah mawsufah fi al-zimmah*. *Ijarah mawsufah fi al-zimmah*, basically, is a forward lease contract which is suitable for property under construction. This type involves the sale of a clearly specified underlying asset which is currently being produced or is constructed for future delivery. Through this contract a sukuk issuer financier undertakes payments during the construction period, whilst sukuk subscriber makes a payment within a specific period until project completion. The essential points of *hybrid sukuk* in the case of Tadau Energy are as follows:

At Inception and During the Construction of Assets	
Step 1	<p>Tadau Energy entered an agreement between sukuk holders. In this case, Tadau Energy acts as “<i>sukuk</i> trustee” or “lessor”. The following agreement were signed on behalf of sukuk holders:</p> <p>(i) <i>Istisna’</i> Agreement (ii) <i>Ijarah</i> Agreement (iii) Service Agency Agreement and (iv) Purchase Undertaking</p>
Step 2	<p>Under <i>istisna’</i> agreement, Tadau Energy acts as “contractor” in respect of each solar photovoltaic (PV) plants. The “contractor” will build, construct and deliver the asset with respect to <i>istisna’</i> price.</p>
Step 3	<p>Whereas, Tadau Energy shall act as the “lessee” when entering into “<i>ijarah agreement</i>”.</p> <p>In this agreement, “<i>sukuk</i> trustee” or “lessor” agrees to lease and the “issuer” or “lessee” agrees to take on the lease of “Asset 1” and “Asset 2” under “<i>Ijarah Mawsufah Fi Zimmah</i>” or “forward lease”.</p>
Step 4	<p>Tadau Energy as the “issuer” shall issue the <i>hybrid sukuk</i> (<i>al-Istisna’</i> and <i>al-Ijarah</i>) to the sukuk holders.</p>
Step 5	<p>Pursuant to a “service agency agreement”, Tadau Energy as the “servicing agent” shall perform all repairs, replacements and maintenance works on each of solar photovoltaic (PV) plants.</p>
Post-completion of the Assets and at Maturity	
Step 6	<p>Upon completion of construction, Tadau Energy as the “contractor” shall notify the “<i>sukuk</i> trustee” regarding the completion of the work. This includes the delivery of the asset.</p>
Step 7	<p>During the lease period, “lessee” will pay the lease rentals to the “<i>sukuk</i> trustee” or “lessor” pursuant to “<i>ijarah</i>” agreement.</p> <p>The final lease rental shall include the following:</p> <p>(a) (i) last periodic distribution amount (ii) nominal value of the relevant maturing tranche and (iii) the ownership expenses</p>
Step 7	<p>Upon a dissolution event, <i>sukuk</i> trustee acts on behalf of sukuk holders for any purchase undertaking activities.</p> <p>(b) Exercise price for the purchase undertaking will be equal to the amount of <i>Istisna</i> price + Ownership expenses + all accrued unpaid lease rental.</p>

Step 8 (a)	<p>Tadau Energy as the “purchaser” will grant a “purchase undertaking” to the <i>sukuk</i> trustee.</p> <p>“Sale of the Asset” here in allows Tadau Energy (purchaser) to undertake the asset from <i>sukuk</i> trustee at the relevant Exercise price.</p> <p>This process is undertaken via “Sale Agreement”.</p>
Step 8 (b)	<p>At the end of the lease period, <i>sukuk</i> trustee shall make periodical distribution amounts to the <i>sukuk</i> holders based on the contract of <i>hibah</i> (gifts).</p>

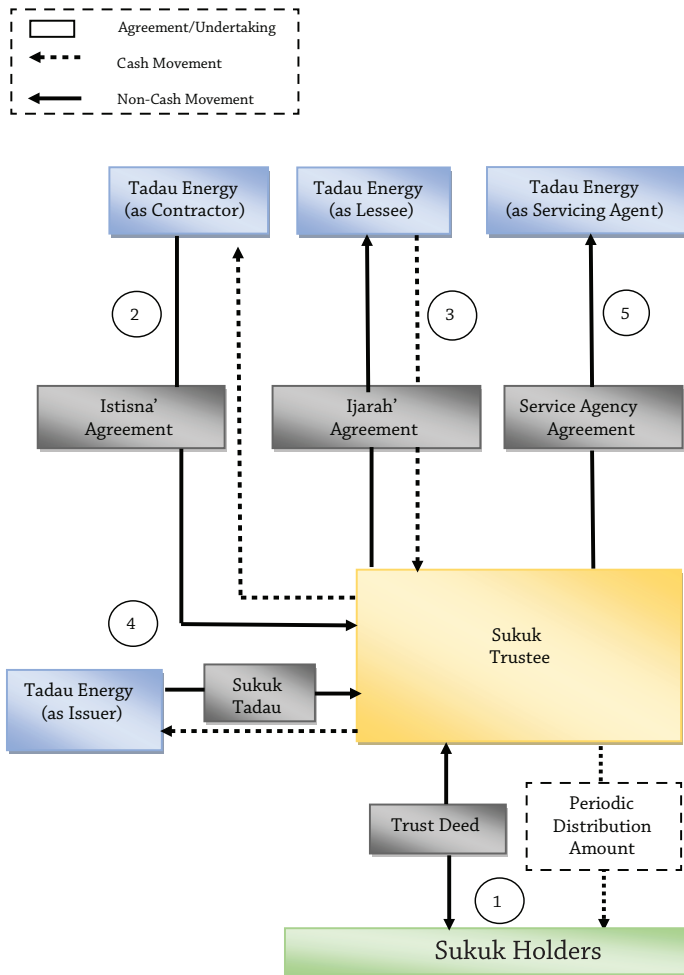


Figure 2: At Inception and During Construction of Assets

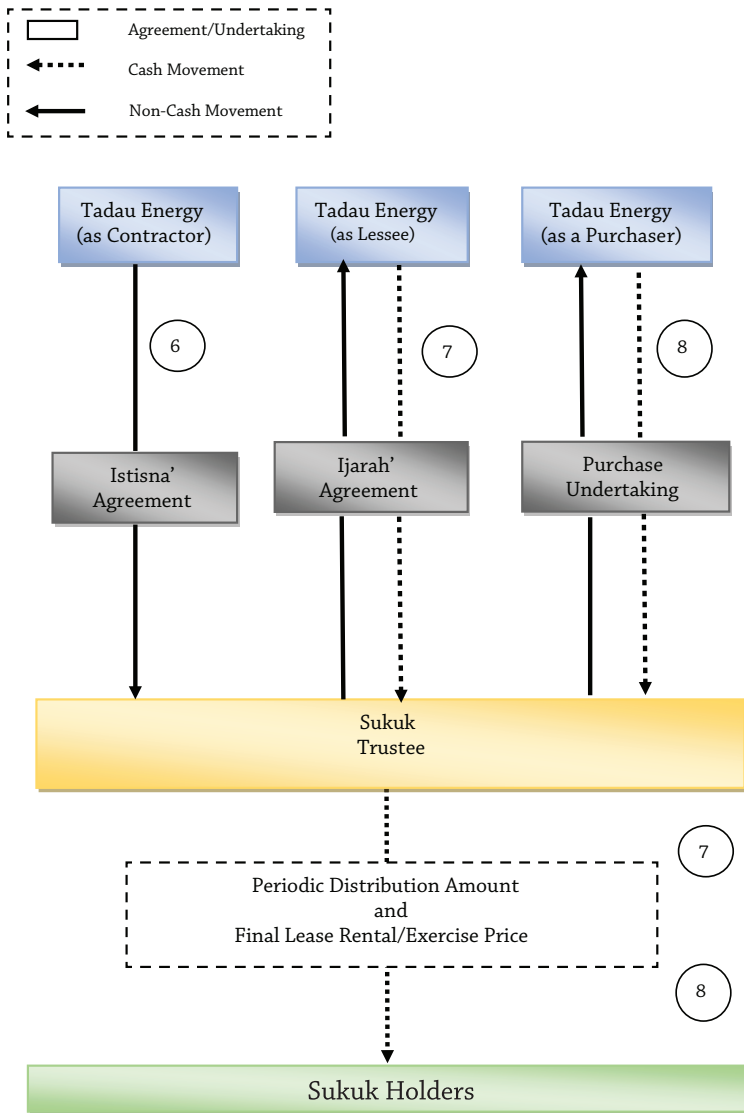


Figure 3: Post completion of the Assets at maturity

BEGW (M) Sdn. Bhd. (Solar Photovoltaic)

The second case study involves BEWG (M) Sdn. Bhd., a subsidiary of Beijing Enterprises Water Group Ltd. The company is known as one of the top leading companies in the water treatment industry. BEWG (M) offers a complete range of comprehensive solutions for a wide range of clients, especially the state government

projects. Recently, BEWG (M) has been undertaking a water treatment project in Bukit Sah, Terengganu. This project was awarded by the Terengganu state government in November 2015 and is expected to be completed in November 2018. The project aims to refurbish and upgrade water treatment plant as well as to solve Kemaman district's water shortage problem.

This project costs RM 499 million which is equivalent to 1.1 billion RMB. In this project, BEWG (M) will be providing related services such as water treatment engineering, waste water treatment engineering, water purification, sewerage treatment and water recycling. To facilitate this project, BEWG (M) issued RM 400 million of sukuk wakalah with a tenure of 8 years. The project is expected to meet the required daily demand of approximately 110,000 tons per day.

The initial construction cost of RM 79 million was funded from BEWG's internal funds whereas the remaining balance of RM 21 million will be met by 80% sukuk and 20% equity financing mix. This 3-year project started in November 2015 and is expected to be completed in November 2018. The Terengganu state government will make six annual payments amounting to RM 686.9 million to BEWG (M) over a five year period. Based on analysts and their opinion, the company currently has deferred payment of RM 129.6 million. Nonetheless, BEWG (M) is seen as capable of meeting its first schedule redemption of RM 90 million in 2020.

Application of Sukuk Wakalah

BEWG (M) has opted for the sukuk wakalah model. Under this model, BEWG (M) acts as "investment wakeel" to the sukuk holders (Figure 4). Operationally, the duty of an "investment wakeel" is thereby to invest the sukuk wakalah into relevant investment portfolio or any wakalah investment. Herein, the "investment wakeel" agrees to lend his or her expertise and management for a particular duration. The relationship between the principal and investor is to comply with certain basic conditions which are described in the contract. The wakalah fee must be determined and agreed at the time of entering into the wakalah contract. In terms of investment return, the sukuk holders can only receive the expected profit, i.e., the amount used to fund the periodic distribution amounts. Any excess will be held by the "investment wakeel" as his benefit. The periodic distribution amounts will be paid to the investors on the relevant periodic distribution dates.

Step 1	<i>Wakalah</i> agreement is signed between <i>sukuk</i> trustee (<i>sukuk</i> holders) and BEWG (M) <i>sukuk</i> issuer. BEWG (M) acts as “investment <i>wakeel</i> ” to the <i>sukuk</i> holders.
Step 2	BEWG (M) as the “ <i>sukuk</i> issuer” shall issue the <i>sukuk wakalah</i> , whereas, <i>sukuk</i> holders subscribe to the <i>sukuk wakalah</i> . The “investment <i>wakeel</i> ” will invest the <i>sukuk wakalah</i> into relevant investment portfolio (<i>wakalah</i> investment).
Step 3	“Investment <i>wakeel</i> ” should maintain at least 33% of the <i>wakalah</i> investment with respect to the <i>Shariah</i> -compliant business.
Step 4 (a)	BEWG (M) as the “buyer”, issues a purchase order (PO) to the “investment <i>wakeel</i> ” to purchase the <i>Shariah</i> -compliant commodities from the <i>sukuk</i> holders at the deferred sale price.
Step 4 (b)	“Investment <i>wakeel</i> ” will purchase the <i>Shariah</i> -compliant commodities (on spot basis) from the commodity suppliers’ at <i>Bursa Suq Al-Sila</i> .
Step 4 (c)	Once the “investment <i>wakeel</i> ” acquires the <i>Shariah</i> -compliant commodities, the “investment <i>wakeel</i> ” will sell it to the “buyer”. The price is equivalent to the commodity purchase price, plus the aggregate profit margin (payable at deferred payment basis).
Step 4 (d)	BEWG (M) as the “buyer” via its agent will immediately sell the <i>Shariah</i> -compliant commodities to the “ <i>Bursa Malaysia Islamic Service Sdn Bhd</i> ” (BMIS) or a “Commodity Broker A” known as a commodity supplier on the spot basis for cash. Usually, a selling price is equivalent to the commodity purchase price.
Step 5	Consequently, BEWG (M) as the “obligor” shall make periodical payment to <i>sukuk</i> holder from any return generated from the “ <i>wakalah</i> investment”. The periodic distribution rate is calculated per 365 days.
Step 6	Upon completion of such purchase, the purchaser appoints the commodity trading participant (CTP) to sell the commodities to the commodity buyer. Transaction trades at market price. Herein, market price refers to the selling price which is equal to the purchase price.
Step 6 (a)	Purchase undertaking takes place from the “obligor” to the <i>sukuk</i> trustee on a scheduled dissolution date or the actual dissolution date, whichever is earlier.
Step 6 (b)	Further, <i>sukuk</i> trustee shall issue a “sale undertaking” to the BEWG (M) (<i>sukuk</i> issuer) at the exercise price by entering into a “sale agreement” upon voluntary early redemption.

<p>Step 7</p>	<p>BEWG (M) proceeds to the “<i>wakalah</i> investment” including exercise price and deferred sale price. Any returns generated from the “<i>wakalah</i> investment” shall be utilized to redeem <i>sukuk wakalah</i> at the dissolution distribution amount on the scheduled dissolution date or the dissolution declaration date upon voluntary early redemption.</p>
<p>Step 8</p>	<p>During the construction period, BEWGL will act as “corporate guarantor”, just in case BEWG (M) fails to make periodical payment to the <i>sukuk holders</i>. BEWGL is responsible for: (i) periodical distribution (ii) exercise price and (iii) deferred sale price However, after the construction period, BEWGL will ensure BEWG (M) (<i>sukuk issuer</i>) has sufficient liquidity to meet the periodical payments to the <i>sukuk holders</i>.</p>

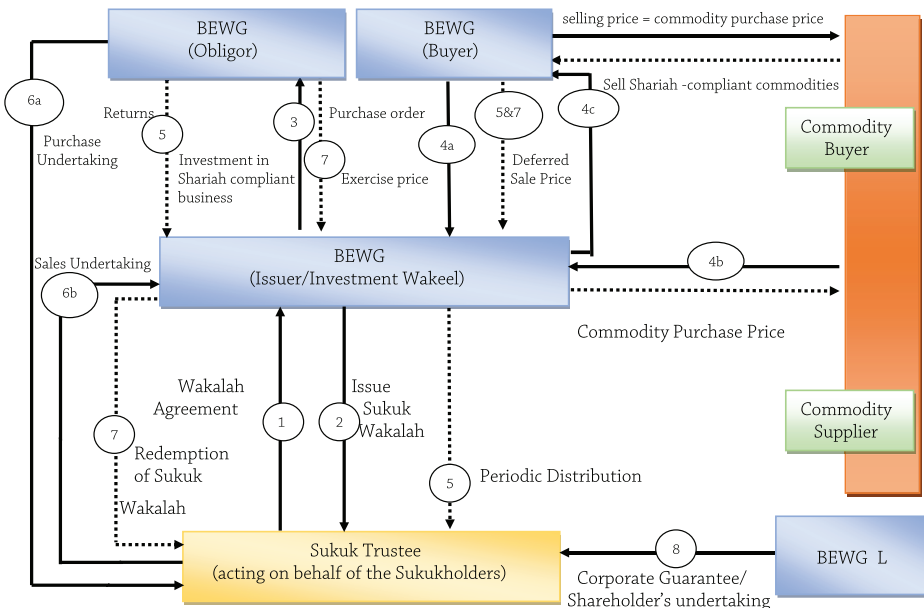


Figure 4: BEGW Sukuk Wakalah

Sarawak Hidro Sdn. Bhd. (BAKUN hydroelectric)

The third case study highlights Sarawak Hidro Sdn. Bhd. Noted that, effectively, on 16th August 2017, Sarawak Energy Berhad (SEB), wholly owned by Sarawak state government successfully acquired 100% of shares in Sarawak Hidro Sdn. Bhd (The Star Online, 2017). Sarawak Energy Berhad (SEB) acquired Sarawak Hidro at a price of RM 2.5 billion including RM 6 billion loan.

Previously, Sarawak Hidro was involved directly in 2,400 MW (BAKUN hydroelectric plant) which is the largest hydroelectric plant in Malaysia since July 2011. BAKUN hydroelectric project is located in Central Sarawak on Rejang River, 180 km by road (east coast of Bintulu, Sarawak). This plant is built by 205 meter high concrete wall facing the rock dam. The cost of this hydroelectric dam was estimated to be around USD\$ 1.6 billion.

On 1st June 2011, Sarawak Hidro secured “Power Purchase Agreement” (PPA) with the Sarawak state government for 30 years. The electricity charges from BAKUN dam to the latter was planned to be 6.25 cents per kilowatt with an annual increase of 1.5% (Figure 6). Prominently, BAKUN hydroelectric project is among the projects run under Sarawak Corridor of Renewable Energy (SCORE), a major development plan for Sarawak.

In essence, SCORE would need higher electricity supply by year 2020 to 2030. This electricity power supply could be generated from hydroelectric. Total hydroelectric capacity is estimated to increase from 966 MW to 12,000 MW and 20,000 MW by 2020 and 2030, respectively (Sovacol & Bulan, 2011).

Application of Sukuk Murabahah

Sukuk murabahah refers to a contract of exchange based on sale and purchase contracts at a predetermined cost and profit. The detailed discussion of sukuk murabahah of Sarawak Hidro is shown in Figure 5. Sukuk Murabahah is more likely to be used with respect to purchases of goods by public sector. In this case, Sarawak Hidro needs to purchase an item of huge price and may purchase it through credit sales by paying in instalments.

Sarawak Hidro as the seller will amortize the cost and return (profit margin) over the period of instalments. At the same time, Sarawak Hidro as the issuer will issue sukuk murabahah certificates according to a certain number

of instalments (Yusoff, Kamdari, & Malik, 2016). Each certificate having a maturity date, represents a property right of the sukuk holders on the basis of which, a sukuk holder can transfer his or her rights to another party.

Step 1	Sarawak Hidro enters into an agreement, appointed as the purchase agent on behalf of sukuk holders.
Step 2	Sarawak Hidro issues a purchase order (PO) to the purchase agent. Purchase agent will irrevocably undertake to purchase the commodities from the sukuk holders with regard to “deferred sale” price.
Step 3	The purchase agent, purchases commodities on the spot through Commodity Trading Participant (CTP) from the commodity seller at the purchase price.
Step 4 (a)	Sarawak Hidro issues sukuk murabahah and acts as the <i>sukuk</i> issuer. Sukuk holders pay the principal’s amount or the purchase price to Sarawak Hidro (<i>sukuk</i> issuer).
Step 4 (b)	The <i>sukuk murabahah</i> evidences the <i>sukuk holder’s</i> ownership of the commodities.
Step 5	Once the commodities are sold to the purchaser, <i>sukuk holder’s</i> is entitled to receive the deferred sale price.
Step 6	Upon completion of such purchase, the Purchaser appoints the Commodity Trading Participant (CTP) to sell the commodities to the commodity buyer. Transaction trades at the market price. Market price refers to (selling price = purchase price).
Step 7	Sarawak Hidro as purchaser receives the mudharabah profits and pays periodic return to the <i>sukuk holders</i> on the relevant periodic payment date. On the expiry of the specified time period of subscription, the <i>sukuk holders’</i> are given the right to transfer the ownership by sale or trade.

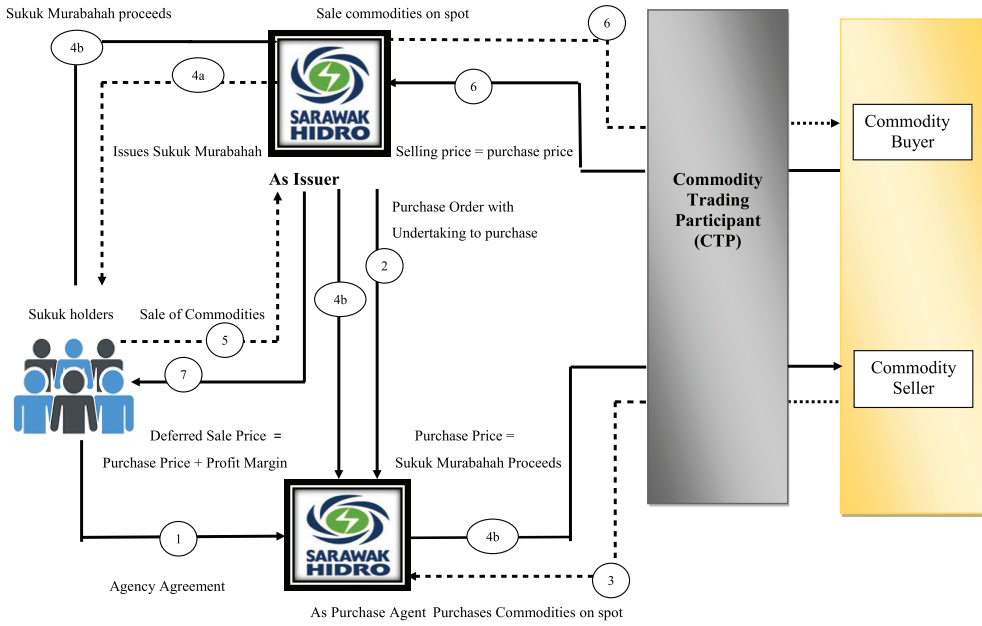


Figure 5: Sarawak Hidro (M) Sdn. Bhd

Conclusion

The recent issuances of the world’s first green sukuk by three energy companies in Malaysia has kick started the growth of green sukuk market and will significantly boost the “cleantech” movement. The initiative is relevant in achieving Malaysia’s agenda to be the green technology hub by 2030. Fundamentally, this paper presents three case studies related to green sukuk. The application of hybrid sukuk was explained in Tadau Energy Sdn Bhd. Besides that we also elaborate the adoption of sukuk wakalah by BEGW (M) Sdn Bhd. Finally, we discussed in details the application of sukuk murabahah by Sarawak Hidro Sdn Bhd. Despite all the government initiatives, the success of green sukuk still relies on the awareness and support by the financial institutions.

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