

Non-Bank Financing Schemes and Business Model Development for Solar PV Rooftop at School Building in West Java Province

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Executive Summary

The Government of West Java is among municipalities with the highest commitments towards SDGs and climate change issues. It is currently implementing a 2018-2023 subnational action plan on SDGs (RAD TPB) and aims for West Java to be a “green province” by 2025. The province has listed potential projects on mitigation, adaptation, particularly in the sector of Sustainable Infrastructure, Sustainable Transportation, Renewable Energy, and Resilience to Climate Change (waste and water system).. Some of these projects have passed the pre-feasibility study stage but have not yet received funding, such as the installation of rooftop photovoltaic (PV) systems in hundreds of state school buildings. These identified potential projects in the pipeline generally have high investment requirements and have specific challenges at the project-level.. Challenges vary from technical to institutional issues, but all lead to the assumption that such projects are not yet commercialized, making it difficult to obtain adequate financing. Therefore, there is a need to develop a range of financial schemes and business models that can overcome investment barriers for the identified climate programs. To achieve this, West Java should optimize the use of public funding in order to boost private finance participation.

This study formulates recommendations for business model options for one of the identified projects that has a pre-feasibility study, that is a rooftop PV system installation project in school buildings. The business model options considered are those that could avoid a potential high up-front costs. Therefore, this study recommends business model options for rental, lease-purchase, and rental through a Joint Venture Energy Service Company (ESCO) collaboration between Regional Owned Enterprises (BUMD) and private investors.

Based on the results of the analysis and input from interviews, the direct rental from ESCO is a feasible option to be implemented.

The main consideration for choosing this business model, is the low level of risk for the facility owner, especially when the assets are owned by ESCO. This provides flexibility for the facility owner (in this case West Java Province) to procure ESCO services and get the most attractive rental rates, that is the rates that require subsidies or the lowest burden to the Regional Budget (APBD).



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1. Introduction

In line with the central government's role in directing overall climate policy and goals, local governments play an important role in ensuring the achievement of these goals at the local level. Local governments translate national government objectives to the Government administrative level at the local level.

Despite this important role, local governments face challenges in mobilizing investment for climate change. Several factors have influenced the current investment gap, with the lack of an investment-ready green project pipeline being a key factor.

The provision of enabling environment for private investment can help to address this challenge by lowering investment risks and increasing the appetite of private investors in financing green projects, so that green projects at the local level can secure financing.

The Government of West Java Province, Indonesia, is among the subnational governments committed towards SDGs and ambitious climate goals. It is currently implementing a 2018-2023 subnational action plan on SDGs (Rencana Aksi Daerah Tujuan Pembangunan Berkelanjutan—RAD TPB) and aims for West Java to be a “green province” by 2025. The province has listed several green projects on mitigation, adaptation, and cross benefit – particularly in the sector of Sustainable Infrastructure, Sustainable Transportation, Renewable Energy, and Resilience to Climate Change (waste and water system).

However, these green projects generally require large investment and possess specific challenges at the project-level. Challenges vary from technical to institutional, but all of them converge to the difficulty of obtaining adequate and sustainable financing.. Therefore, West Java needs to develop a set of enabling policies to optimize the use blended finance, addressing investment barriers for climate resilience related programs.

This report focuses on developing a rooftop PV system business model for Government-owned schools in West Java Province. The recommended business model options are lease and rental options, in order to minimize the large portion of the initial investment for the West Java Government. This report also provides an illustration of a similar project in Central Java and the fiscal impact for the Government of West Java on the subsidies required for business model schemes for rooftop PV system lease and rental.



2. Non-Bank Business Model Scheme

2.1 Rental Business Model with Private ESCO

In this business model scheme, the West Java Government, as the facility owner of the school buildings, cooperates through a rooftop PV system equipment rental agreement with a rooftop PV system service provider, namely the Energy Service Company (ESCO). The following figure is the rental business model scheme with ESCO:

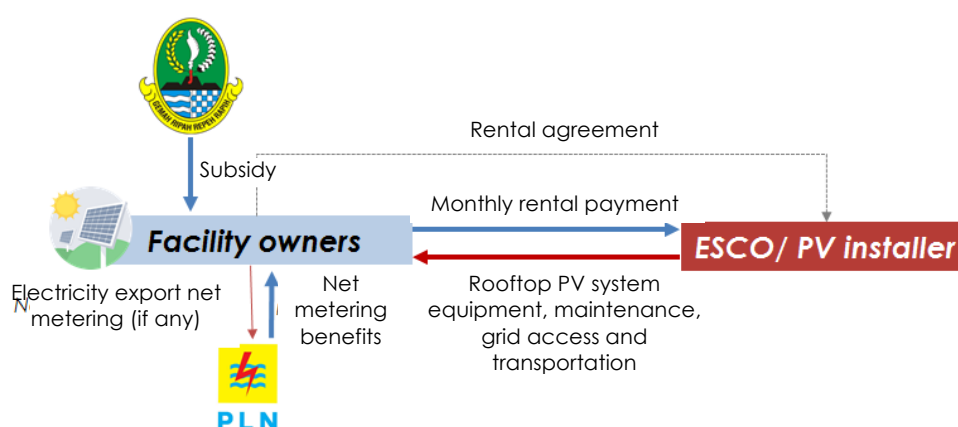


Figure 1. Non-Bank Rental Business Model Scheme with Private ESCO

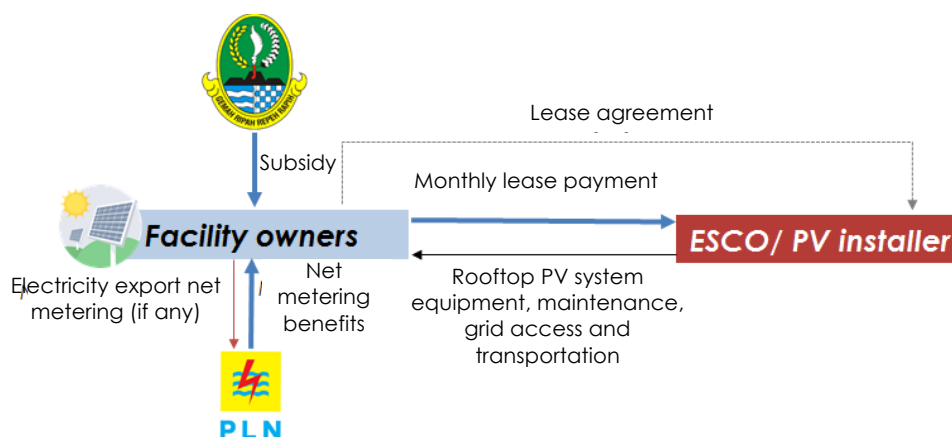
In this scheme, the rental agreement contract can be of short or long duration, with an estimated term of the agreement/cooperation contract that can reach a minimum of 5 years and can be extended. For information, the productive age of PV system units can usually be up to 25 years. Further, ESCO will install rooftop PV system according to capacity requirements. During the contract period, the facility owner will pay a monthly rental fee for electricity usage from the rooftop PV system to the ESCO at the agreed rate. The obligation of ESCO is to carry out routine maintenance of the rooftop PV system during the contract period and if at the end of the contract period there is no extension of the cooperation, ESCO will be responsible for dismantling and moving the installation of the rooftop PV system.

The ownership of the rooftop PV system assets remains with ESCO. Actually, there is also an option where the asset can belong to the owner of the facility at the end of the contract period, but this will have an impact on the higher rental payment rate per month. Based on the perspective of the facility owner and ESCO, here are the benefits of a rental business model scheme:

Benefits for ESCO	Benefits for Facility Owners
Asset ownership is retained by the ESCO	No large investment in the initial phase of the project
Decent rate can be achieved through subsidized assistance from the local government	Low risk to assets because asset ownership is retained by the ESCO
Flexible options at the end of the contract regarding contract extension/asset transfer/asset renewal	Cost sharing between the facility owner and the local government through a subsidy on the difference between rental rates and PLN electricity rates

2.2 Lease-Purchase Business Model with Private ESCO

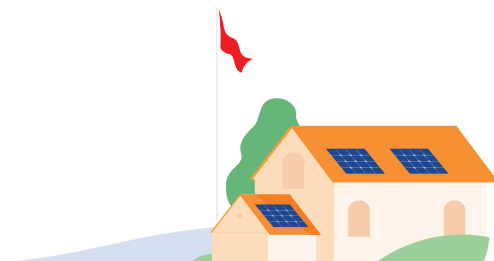
Principally, the private business model scheme is similar as the rental scheme, but the ownership of the assets is retained by the facility owners. In this business model scheme, the West Java Government as the facility owner of the Government-owned school buildings, cooperates through a rooftop PV system equipment lease agreement with a rooftop PV system service provider (ESCO). At the end of the lease term, ownership of the assets is transferred from ESCO to the facility owner. The following figure is a schematic of the lease business model with ESCO:



Gambar 2. Skema Model Bisnis Non-Bank Sewa dengan ESCO Swasta

In this scheme, the lease-purchase agreement contract can also be of short or long duration, with an estimated term of the agreement/cooperation contract that can reach a minimum of 5 years and can be extended. Further, ESCO will install rooftop PV system according to capacity requirements. During the contract period, the facility owner will pay a monthly lease fee for electricity usage from rooftop PV system to the ESCO at the agreed rate. The obligation of ESCO is to carry out routine maintenance of the rooftop PV system during the contract period and at the end of the contract, the facility owner can determine the next rooftop PV system utilization scheme.

Regarding the ownership of the rooftop PV system assets, the assets belong to the facility owner. The term lease-purchase is the purchase of rooftop PV system utilization services for a certain period of time by taking into account the cost of the assets at the end of the contract duration. In this scheme, there will be a difference in tariff determination from ESCO compared to the rental scheme.



This is because there is an asset purchase expense which is calculated through the calculation of the present value and is integrated to the calculation of the tariff, so that the monthly payment rate will be higher than the rental scheme. From the perspective of the facility owner and the ESCO, here are the benefits of a leasing business model scheme:

Benefits for ESCO	Benefits for Facility Owners
Ownership of assets is retained by the facility owner, and it requires a determination of the mechanism for asset utilization at the end of the contract period.	No large investment in the initial phase of the project
Decent rate can be achieved through subsidized assistance from the local government	The multi-year contract guarantees the continuity of asset maintenance
Optimum benefits can be obtained with a large business scale in various locations	Cost sharing between the facility owner and the local government through a subsidy on the difference between lease rates and PLN electricity rates

2.3 Business Model of Cooperation between Regional Owned Enterprises and Private Enterprises

The Regional Owned Enterprises (BUMD) cooperation scheme with private enterprises aims to develop BUMD's business in the renewable energy and energy efficiency sector by starting with a rooftop PV system rental scheme for school buildings. With the ownership of the assets in the Joint Venture (JV) company, the aspect of asset management and the development of the rooftop PV system business becomes more flexible for BUMD. The figure below is a business model scheme for BUMD cooperation with private enterprises:

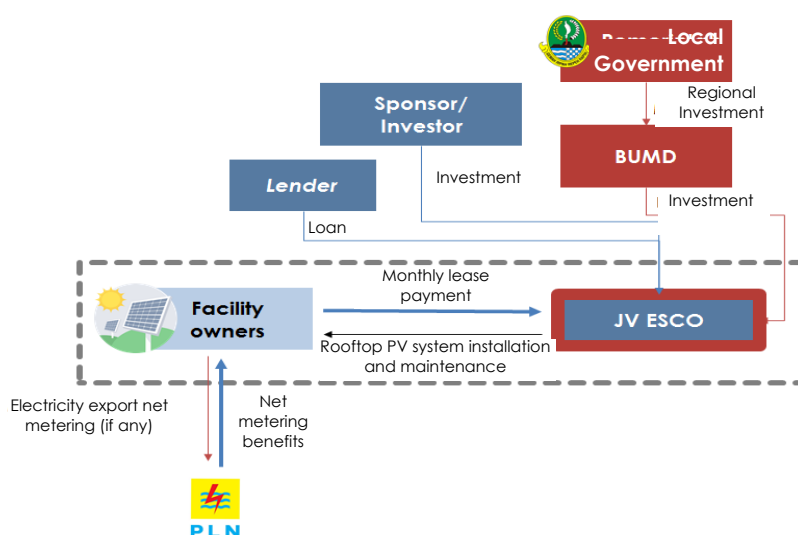


Figure 3. Business Model Scheme of Regional-Owned Enterprises with Private Enterprises

The rental scheme through JV ESCO has the same flow as the rental scheme, that the payment of rental fees at the agreed rates in the multi-year contract between the facility owner or the Government of West Java and the JV ESCO company. Then, the ESCO will install rooftop PV system according to capacity requirements. The obligation of the ESCO is to carry out routine maintenance of the rooftop PV system during the contract period.

Regarding West Java government's fiscal support to JV ESCO, it can be distributed in the form of regional investment to BUMD, according to the need for fiscal support.. The regional investment can be allocated to cover operational costs or the cost of purchasing rooftop PV system assets. In addition, BUMD also has the flexibility to fund projects through financial institution loans or the capital market. Under these conditions, the West Java Government can appoint BUMDs that are currently operating and have experience in the infrastructure sector. Here are the benefits for the facility owner and the JV ESCO:

Benefits for JV ESCO	Benefits for Facility Owners
Asset ownership is retained by the JV ESCO, and there is flexibility in asset management	No large investment in the initial phase of the project
Flexibility of support through investment	The multi-year contract guarantees the continuity of asset maintenance
Direct assignment from the Regional Government to BUMD to manage the installation of rooftop PV system	Cost sharing between the facility owner and the local government

2.4 Regulatory Aspects of the Rental/Lease Business Model

The three innovative business model options for rooftop PV system can be implemented, as they have been accommodated by existing regulations. Currently, there are three regulations that enable rental/lease business models:

Regulation	Aspects Related to the Rooftop PV System Business Model
Minister of Energy and Mineral Resources Regulation No. 49/2018 concerning the Use of Rooftop Photovoltaic Systems by Consumers	<ul style="list-style-type: none"> • Management of rooftop PV systems and net metering of electricity exports to PLN and the benefits obtained • With the latest revision of the Ministerial Regulation, the total capacity of the rooftop PV systems installation is equal to electrical power, after previously the panel capacity was 65% of the total electrical power at the location. • The benefits that can be obtained if there is an export of electricity to PLN is a reduction in the burden of electricity consumption in the next current month in accordance with the amount of electrical power exported.
Minister of Home Affairs Regulation No. 96/2016 concerning Availability Payments in the Context of Cooperation between Regional Governments and Private Enterprises	<ul style="list-style-type: none"> • A form of long-term support for the rental/lease model using the state budget to minimize costs by avoiding the requirement of upfront investment • Opportunity to allocate special funds as a subsidy • Incentivize private ESCOs for efficient construction, operation and maintenance • Provide an opportunity to set public performance standards on sustainable energy

2.5 Concept of Fiscal Support Needs

The implementation of the rooftop PV system business models depends on the return on investment that can attract the private sector. With the current PLN electricity tariff for school buildings (IDR 900/kWh), it is likely that the rental and lease rates for rooftop PV system will be higher than PLN's rates, thus requiring fiscal support from the government. Based on IESR data on the Levelized Cost of



Electricity in Indonesia, the tariff of PV system is at IDR 988/kWh, which is higher than the PLN tariff paid by school buildings.

With the characteristics of investment needs for rooftop PV system, government fiscal support is needed every year to cover the gap between rental rates and PLN rates. Government support is not required if the rental rate is below the PLN rate. For illustration, here is the traditional approach to financing infrastructure development:

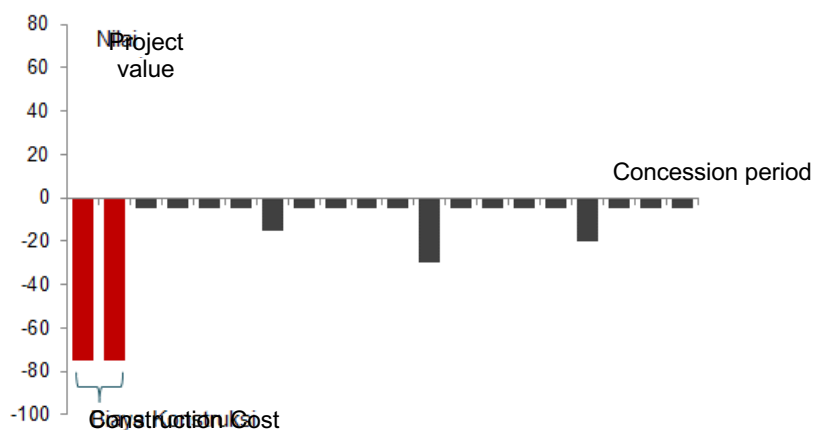


Figure 4. Traditional approaches to infrastructure financing

By using the traditional approach, the initial construction or investment costs are charged to the entire project value in the initial period of the concession. Hence, it requires largest investment in the early years of the construction period. During the concession period, expenses for operating and maintaining assets are borne by the operator. In this traditional approach, there is no government fiscal support involved.

The next approach is a service purchase approach, including rooftop PV system rental/lease models:

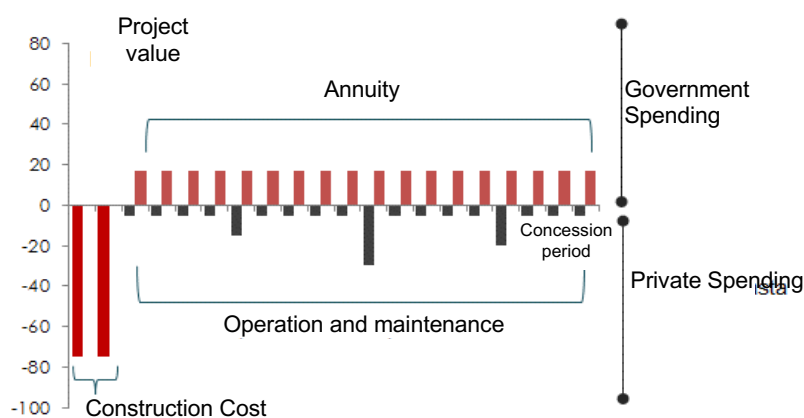


Figure 5. Service purchase approach (Availability Payment)

Through this approach, the government contributes in providing fiscal support to finance operational and maintenance costs every year. The amount of fiscal support is determined based on the results of the project feasibility analysis along with the length of the project concession period. Using same concept, government fiscal support can also be provided in the form of subsidized tariffs for rental/private schemes for rooftop PV systems.

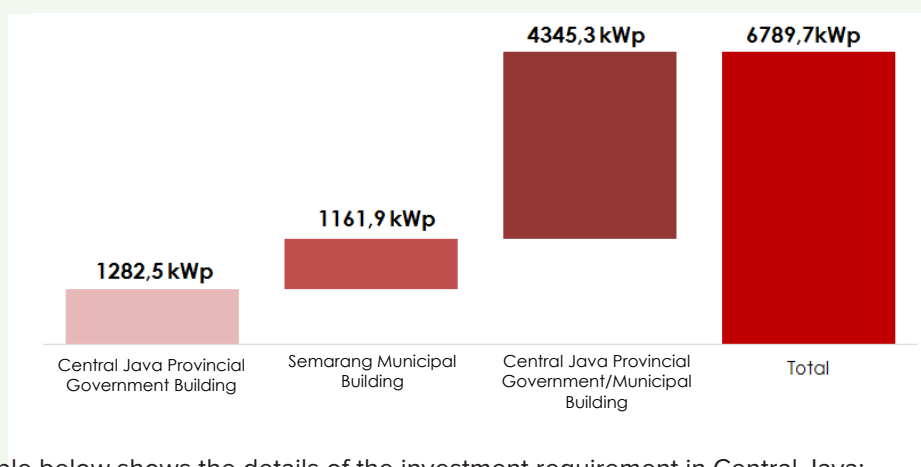
BOX 1

Case Study of Rooftop PV System Investment Calculation in Government Buildings in Central Java Province

The following case study is based on the analysis of the potential of PV system in Central Java which has been carried out by the Institute for Essential Services Reform (IESR). Central Java has a PV System (PLTS) potential of 4.05 kWh/kWp per day, which is above the national average potential, and is one of the three regions with the highest potential in Indonesia for PV Systems deployment. The Governor has issued instructions to optimize the installation of PV mini-grid systems in various sectors, such as industrial, commercial and public buildings.

The total investment requirement to install rooftop PV systems for all buildings is IDR 143.1 billion, based on IESR estimates, that 1 kWp requires IDR 18 million.

Potential Capacity of Rooftop PV Systems in Central Java



The table below shows the details of the investment requirement in Central Java:

Building	kWp	Investment requirement (IDR)
Total provincial government building	2,444.4	43,999,200,000
Semarang Municipal Building	1,161.9	20,914,200,000
Total Central Java provincial government/municipal building	4,345	78,210,000,000
Total investment requirement	9,234	166,208,400,000

With a total investment requirement of IDR 166 billion, the fiscal capacity of Central Java Province is still able to meet the needs of the rooftop PV system project. For the financing scheme, the available options are to include the use of APBD, local government loans through PT SMI, and the issuance of regional bonds.



3. Simulation of Calculation of Rooftop PV Systems in School Buildings in West Java

3.1 Simulation of Financing and Fiscal Support Needs

In the simulation of rooftop PV system investment calculations, rental and lease rates are assumed through four scenarios, including

- Tariff 1: IDR 988/kWh
- Tariff 2: IDR 1200/kWh
- Tariff 3: Rp.1400/kWh
- PLN Tariff: IDR 900/kWh

Based on pre-feasibility study data obtained from the Regional Development Planning Agency (Bappeda) of West Java Province, the projected energy needs for school buildings are for 117 vocational school buildings with an energy requirement of 10.3 million kWh and 56 high school buildings with an energy requirement of 5.3 million kWh. The total projected project scale is 15.6 million kWh.

The following figure describes the total amount of electricity costs in accordance to the projected energy needs added to each tariff scenario:

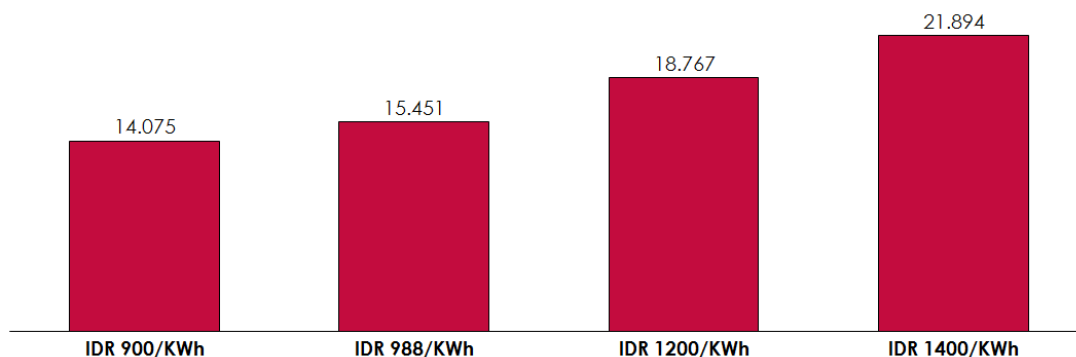


Figure 6. Simulation of the total cost of electricity each year (in IDR million)



Based on the graph above, the subsidy requirements for the three tariff scenarios which are above the PLN tariff are as follows:

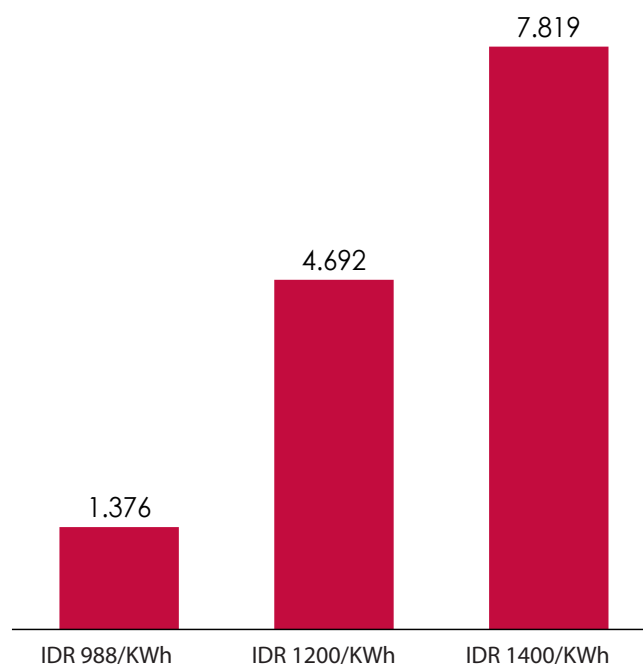


Figure 7. Simulation of the total cost of electricity each year (in IDR million)

The average subsidy requirement for each vocational school and high school building is as follows:

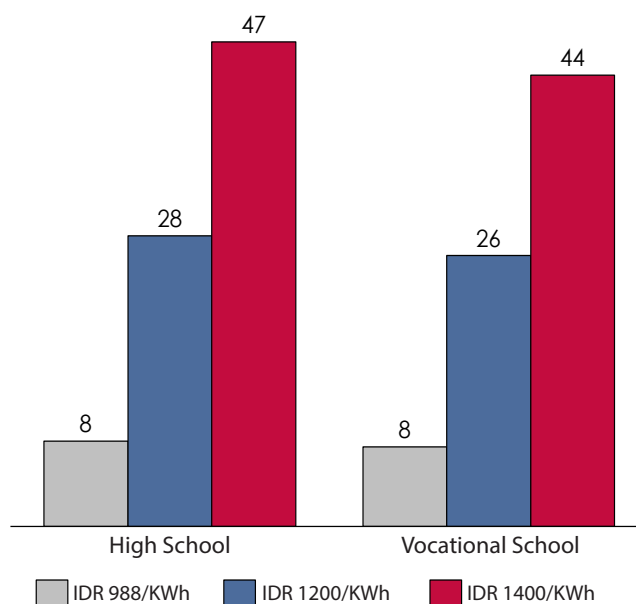


Figure 8. Average Annual Subsidy Requirement (in IDR million)



3.2 Conclusion of Fiscal Support Needs

Based on the above analysis, the higher the rental rate, the higher the amount of subsidies to be allocated by the West Java Provincial Government. As the irradiation characteristics of each area may vary, the above calculation may change according to the rental/lease costs that are adjusted to the capacity of the rooftop PV system in each location. Further analysis is needed to obtain the most appropriate tariff for the rental/lease scheme by considering aspects of asset ownership and business scale to provide a more accurate picture of the need for fiscal support.

In addition, with the annual declining trend of rooftop PV system investment costs, the West Java Provincial Government also needs to consider the aspect of reducing rooftop PV system investment costs into the calculation of the benefits and costs for a certain period.



4. Conclusion of the Non-Bank Business Model

Based on the three business model options, each model has a positive and negative impact on the West Java Provincial Government:

	<i>Direct Rental Model</i>	<i>Direct Lease model</i>	<i>JV Rental Model</i>
Positive Impact			
No large upfront investment required for the facility owner	✓	✓	✓
Gain benefits from PLN	✓	✓	✓
Can be replicated in many locations	✓	✓	✓
Lower risk because the assets are not owned by the facility owner	✓		✓
Negative Impact			
Higher complexity for long term contracts	✓	✓	✓
Require subsidy	✓	✓	✓
Long-term contracts require to maintain public performance for project	✓	✓	

Figure 9. The positive and negative impacts of each business model option

The analysis of the positive and negative impacts can be used as a consideration for the West Java Provincial Government to choose a rooftop PV business model option by taking into account the need for subsidies and regional fiscal capacity. Based on the analysis results and input from rooftop PV system experts, the direct rental option to ESCO is the most feasible option to implement.

The main considerations for choosing the rental business model from ESCO include the low level of risk for the facility owner, especially where the ownership of the assets is retained by the ESCO, thus providing flexibility for the facility owner to procure ESCO services to get the most attractive rates, which is the tariff that requires the lowest subsidy. Moreover, based on input from interviews with experts, rooftop PV system developers are ready to implement a rental business model scheme, yet still considering the need for subsidies to obtain a reasonable rate.



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Indonesia has made significant progress in mainstreaming green economy activities into the country's macroeconomic and national development plans. The country has also increased their global climate commitments – including setting a net zero emissions target by 2060. However, the energy sector in Indonesia remains the country's second-largest carbon emitter, with national power generation being highly dependent on fossil fuels – particularly coal. As such, energy transition is a critical mechanism to achieving Indonesia's climate targets and green economy ambitions.

Energy transition will, however, create significant employment changes in the energy and electricity sectors. In the face of such changes, developing a supportive policy ecosystem to enable future green jobs growth and to ensure a Just Transition is critical. This green jobs policy readiness assessment aims to develop a baseline perspective of current green jobs and Just Transition policy frameworks in Indonesia, with a focus on the energy sector. To this end, the report explores recommendations for measures aimed at supporting the labour market, from both the supply and demand sides, as well as for overarching measures that will promote the enabling environment needed to ensure a Just Transition process.

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