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Desain Skema Pembiayaan Solar PV Off-Grid Untuk UMKM Produktif Di Daerah Tertinggal: Evaluasi Pendekatan Avoided Cost dan Adaptasi Cash Flow-Based Financing
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ABSTRAK

DESAIN SKEMA PEMBIAYAAN SOLAR PV OFF-GRID UNTUK UMKM PRODUKTIF DI DAERAH TERTINGGAL: EVALUASI PENDEKATAN AVOIDED COST DAN ADAPTASI CASH FLOW-BASED FINANCING

Penelitian ini bertujuan merancang skema pembiayaan yang mampu meningkatkan bankability dan mempercepat adopsi solar photovoltaic (PV) off-grid oleh usaha mikro, kecil, dan menengah (UMKM) di daerah tertinggal Indonesia. Investasi solar PV off-grid memiliki karakteristik unik, biaya awal tinggi, arus kas berbasis penghematan energi, dan umur ekonomis panjang, yang tidak kompatibel dengan skema pembiayaan konvensional. Di 62 kabupaten tertinggal (Perpres No. 63/2020), PDB per kapita hanya Rp17,3 juta per tahun dengan tingkat kemiskinan 27,4%, sementara ketergantungan pada diesel mencapai Rp17.000 per liter, menjadikan substitusi solar PV sebagai economic uplift potensial yang signifikan.

Penelitian menggunakan pendekatan policy-oriented design research kualitatif eksploratif. Data dikumpulkan melalui studi literatur, analisis dokumen kebijakan, dan Focus Group Discussion (FGD) bersama delapan lembaga pemangku kepentingan pada Mei–Juni 2025. Analisis mencakup empat tahap: pemetaan hambatan bankability berbasis Five Cs of Credit, identifikasi mismatch struktural skema eksisting, evaluasi kelayakan finansial tiga opsi skema menggunakan financial model kuantitatif dengan analisis sensitivitas tiga skenario (Conservative–Base–Best), dan sintesis desain skema beserta condition precedent implementasinya.

Penelitian menghasilkan tiga temuan utama. Pertama, hambatan bankability UMKM 3T bersifat multi-dimensional di seluruh lima dimensi Five Cs secara simultan, dengan hambatan terberat pada Collateral dan Conditions yang hanya dapat diatasi melalui intervensi regulatoris. Kedua, terdapat empat mismatch struktural antara skema eksisting dan kebutuhan solar PV off-grid: tenor (KUR 5 tahun vs kebutuhan 15 tahun), basis penilaian (agunan/SLIK-OJK vs arus kas bisnis aktual), skala (plafon Rp50 juta vs CAPEX komunal Rp450–600 juta), dan de-risking reaktif. Ketiga, pendekatan avoided cost terbukti tidak memadai sebagai basis DSCR tunggal (0,12x–0,36x) dan dirumuskan ulang sebagai economic uplift dalam CF-based financing. Opsi 3 (KUR Tematik Hijau, 6%, tenor 15 tahun) layak tanpa subsidi CAPEX untuk Perikanan (DSCR 1,21x) dan Eco-Tourism (DSCR 1,31x), sementara Agrikultur memerlukan instrumen di luar ketiga opsi. Rekomendasi utama: revisi Permenko Perekonomian No. 1/2023 untuk perpanjangan tenor KUR dan pengakuan solar PV sebagai agunan dalam SIKP.

Kata kunci: *pembiayaan solar PV off-grid, UMKM daerah tertinggal, avoided cost, cash flow-based financing, KUR Tematik Hijau, bankability, project finance*

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SUMMARY

DESIGN OF OFF-GRID SOLAR PV FINANCING SCHEMES FOR PRODUCTIVE MSMES IN UNDERDEVELOPED REGIONS: EVALUATING THE AVOIDED COST APPROACH AND ADAPTING CASH FLOW-BASED FINANCING

This study aims to design financing schemes that improve the bankability and accelerate the adoption of off-grid solar photovoltaic (PV) systems by micro, small, and medium enterprises (MSMEs) in Indonesia's underdeveloped regions. Off-grid solar PV investment has unique characteristics — high upfront costs, savings-based cash flows, and long economic lifespans — incompatible with conventional financing. In 62 underdeveloped districts (Presidential Regulation No. 63/2020), per capita GDP is only IDR 17.3 million/year with a 27.4% poverty rate, while diesel dependency costs reach IDR 17,000/liter — making solar PV substitution a potentially significant economic uplift.

This research employs a qualitative, exploratory policy-oriented design research approach. Data were collected through literature review, policy document analysis, and Focus Group Discussions (FGD) with eight stakeholder institutions in May–June 2025. The analysis covers four stages: mapping bankability barriers using the Five Cs of Credit, identifying structural mismatches in existing schemes, evaluating financial feasibility of three scheme options via a quantitative financial model with three-scenario sensitivity analysis (Conservative–Base–Best), and synthesizing scheme designs with implementation condition precedents.

The study produces three key findings. First, the bankability barriers faced by MSMEs in underdeveloped regions are multi-dimensional across all five Five Cs dimensions simultaneously, with the most severe barriers in Collateral and Conditions, which can only be addressed through regulatory intervention. Second, four structural mismatches exist between existing schemes and off-grid solar PV requirements: tenor (KUR's 5-year maximum vs. the required 15-year minimum), assessment basis (collateral/SLIK-OJK vs. actual business cash flow), scale (the IDR 50 million ceiling vs. communal CAPEX of IDR 450–600 million), and reactive de-risking. Third, the avoided cost approach proves insufficient as a standalone DSCR basis (0.12x–0.36x) and is reformulated as an economic uplift within a cash flow-based financing framework. Option 3 (Green Thematic KUR, 6%, 15-year tenor) is viable without CAPEX subsidies for Fisheries (DSCR 1.21x) and Eco-Tourism (DSCR 1.31x), while Agriculture requires instruments beyond the three options. The key recommendation is to revise Coordinating Minister Regulation No. 1/2023 to extend KUR tenor and recognize solar PV as eligible collateral within SIKP.

Keywords: *off-grid solar PV financing, underdeveloped region MSMEs, avoided cost, cash flow-based financing, Green Thematic KUR, bankability, project finance*