OPPORTUNITIES AND CHALLENGES FOR COMMUNITY-BASED RENEWABLE ENERGY FINANCING

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Opportunities and Challenges for Community-Based Renewable Energy Financing

Authors

CELIOS
Bhima Yudhistira Adhinegara
Lay Monica
Nailul Huda
Jaya Darmawan

350.org Indonesia
Firdaus Cahyadi
Suriadi Darmoko
Jeri Asmoro
Dian Paramita
Ginanjar Ariyasuta

Design by
Mohammad Arifin

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Key Findings

US$658 billion

Community-based renewable energy in Indonesia can contribute US$658 billion to GDP (Gross Domestic Product) over 25 years, while its impact on total economic output is expected to reach US$1,164 billion.

> 16 million people

The positive effect of community-based renewable energy can reduce poverty by more than 16 million people.

US$ 609.3 billion

The surplus profit for business actors, especially on the SME scale, is estimated to be US$ 609.3 billion for 25 years.

US$227.8 billion

Cumulative wages generated from a fully supported community-based renewable energy is estimated at US$227.8 billion.

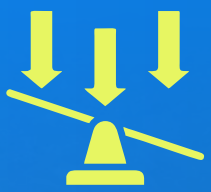
96 million people

As many as 96 million workers can be employed in various sectors, from installation and operations to maintenance of small-scale renewable energy.

cumulative for 25 years

US$12.4 billion

State revenue could increase by US$12.4 billion through net taxes (cumulative for 25 years), which shows the benefits of community-scale energy directly on state revenues.



Community-based renewable energy financing has had a positive impact on reducing inter-regional inequality over 20 years of implementation.

50% of JETP's US$20 billion funding commitment

2.18 GW

If 50% of JETP's US$20 billion funding commitment is used to develop community-scale renewable energy, it could produce a capacity of up to 2.18 GW. Renewable energy plants can at least replace 3.3 PLTU units equivalent to Cirebon-1, which has a capacity of 660 MW.

Photo: Rafaela for CELIOS

PREFACE: ENERGY TRANSITION CONTEXT

As of 2022 in Indonesia, at least 4,400 villages do not have access to electricity[1]. However, if we redefine 'access to electricity' as the electricity supplied by networks built and maintained by PLN (Indonesia Electricity Company-SOE), more villages and households would fall under the category, which is ironic considering there is an excess in electricity production. The latest data shows that national electricity production is reaching 81,2 GW, of which 68.7 GW comes from fossil energy. Specifically, 42.1 GW of the total capacity uses coal.[2]

The existing scheme of centrally-planned and centrally-aggregated power plants based on fossil fuel might explain why many households are still unable to access electricity, even though Indonesia has tremendous potential for renewable energy. The electricity production capacity from renewable hydroelectric sources must still reach its theoretical potential of 94.6 GW. Other prospective sources for renewable energy are solar energy (3.294 Giga Watt Peak[3]) and offshore and onshore wind energy (589 GW and 19.6 GW, respectively).[4]

The potentiSelf-provision of electricity by communities has been introduced previously in Indonesia. Many areas and organizations, including the government, have implemented it through grant projects. Ministry of Energy data shows that 1,270,382 households are supported by non-PLN electricity, indicating that PLN cannot meet electricity demand in all areas. However, this experience still needs to materialize into a more concrete effort. The needs are substantial and well-defined, the experiences are plenty, and yet electricity is still not accessible to all Indonesians.

1 Setiawan, V. N. (n.d.). Lapor Pak Jokowi, 4.400 Desa RI Belum Teraliri Listrik! CNBC Indonesia. Retrieved May 6, 2024, from https://www.cnbcindonesia.com/news/20221128150739-4-391844/lapor-pak-jokowi-4400-desa-ri-belum-teraliri-listrik

2 Kapasitas Terpasang Pembangkit Listrik RI Capai 81,2 GW per 2022—Dataindonesia.id. (n.d.). Retrieved May 6, 2024, from https://dataindonesia.id/energi-sda/detail/kapasitas-terpasang-pembangkit-listrik-ri-capai-812-gw-per-2022

3 antaranews.com. (2021, November 24). Kementerian ESDM sebut potensi energi surya capai 3.294 GWp. Antara News. https://www.antaranews.com/berita/2543829/kementerian-esdm-sebut-potensi-energi-surya-capai-3294-gwp

4 Potensi Energi Terbarukan Indonesia Baru Tergarap 0,3% sampai 2021 | Databoks. (n.d.). Retrieved May 11, 2024, from https://databoks.katadata.co.id/datapublish/2022/10/25/potensi-energi-terbarukan-indonesia-baru-tergarap-03-sampai-2021

Generating electricity from renewable energy is necessary to meet the electricity needs of villages that have yet to be electrified and to increase the shares of renewable energy based on locally available sources. At the very least, this scheme aims to prioritize renewable energy while fossil energy acts as a reserve.

It is necessary to be more aware of the challenges and opportunities we face to accelerate the implementation of electricity generation from renewable energy at the community level.

At the 26th annual meeting of the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) in 2021 in Glasgow, England, an energy transition funding initiative emerged. The funding scheme is called the Just Energy Transition Partnership (JETP).

At the G20 Summit in Bali in 2022, Indonesia succeeded in raising funding commitment for the energy transition. The fund came from developed nations led by the United States and Japan. The funding scheme is called JETP (Just Energy Transition Partnership). These developed countries promised to provide funding of US$20 billion, equivalent to IDR 320 trillion, at the time.

JETP funding is still relatively small compared to Indonesia's energy transition financing needs, but it can provide an initial stimulus for funding the next energy transition. Considering JETP's position as a funding stimulus for the energy transition, it makes sense to direct part of its funding to finance community-based renewable energy. Apart from encouraging economic growth from the local level, community-based renewable energy is also a form of energy justice, which is one of JETP's primary goals.

This research was carried out to find solutions to overcome various obstacles that hinder implementing community-based renewable energy development, which were encountered during a solution-finding expedition embarked on by 350.org Indonesia. Therefore, this research is vital to identifying problems in developing renewable energy regarding policy, funding, and the community and producing recommendations for the identified issues.

Jakarta, 3 May 2024

Photo: 350.org Indonesia

ECONOMIC IMPACT OF COMMUNITY-BASED RENEWABLE ENERGY

Methodology

The research team used the Interregional Input-Output (IRIO) model to simulate the economic impact of implementing community-based renewable energy throughout Indonesia. Although IRIO and Input-Output (I-O) have many similarities, IRIO supports detailed inter-regional and intra-regional impact analysis, including multiple impacts on various economic sectors and implications on other regions.

Interregional Input-Output (IRIO) allows us to examine the impact of community-based energy in one region on other regions. The IRIO table collects input-output from the various areas connected by inter-regional trade transactions. The table also reflects the flow of goods between regions, representing inter-regional trade.

IRIO analysis is generally explained in Table 1, which includes the input process of economic transactions to production output. In calculating the output, the primary production sector generates input for the primary production sector and the secondary and tertiary sectors, adding to the final demand in each province.

Table 1. IRIO Methodology

Province		D			J			Others		
Sector		1	...	16	1	...	16	1	...	16
D	1	Z_{11}^{DD}	...	Z_{116}^{DD}	Z_{11}^{DJ}	...	Z_{116}^{DJ}	Z_{11}^{DL}	...	Z_{116}^{DL}
	⋮									
	16	Z_{161}^{DD}	...	Z_{1616}^{DD}	Z_{161}^{DJ}	...	Z_{1616}^{DJ}	Z_{161}^{DL}	...	Z_{1616}^{DL}
J	1	Z_{11}^{JD}	...	Z_{116}^{JD}	Z_{11}^{JJ}	...	Z_{116}^{JJ}	Z_{11}^{JL}	...	Z_{116}^{JL}
	⋮									
	16	Z_{161}^{JD}	...	Z_{1616}^{JD}	Z_{161}^{JJ}	...	Z_{1616}^{JJ}	Z_{161}^{JL}	...	Z_{1616}^{JL}
Others	1	Z_{11}^{LD}	...	Z_{116}^{LD}	Z_{11}^{LJ}	...	Z_{116}^{LJ}	Z_{11}^{LL}	...	Z_{116}^{LL}
	⋮									
	16	Z_{161}^{LD}	...	Z_{1616}^{LD}	Z_{161}^{LJ}	...	Z_{1616}^{LJ}	Z_{161}^{LL}	...	Z_{1616}^{LL}

The diagonal matrix Z is a transaction matrix between sectors of a region. Meanwhile, the off-diagonal matrix Z represents inter-sector and inter-regional transactions. This off-diagonal matrix does not have to be square because the number of sectors in one region can differ.

In addition, this study also calculates the impact of policies on gross domestic product and labor absorption. The impact measurement refers to changes in investment value generated by constructing new and renewable energy power plants. In this approach, changes in exogenous variables of final demand can affect the increased output in all sectors (having similarities to the Keynesian multiplier framework). For example, investment can be allocated to specific sectors or all sectors in all provinces. Even with the same number, the impact will be different because the strengths and relationships of each industry and province are different.

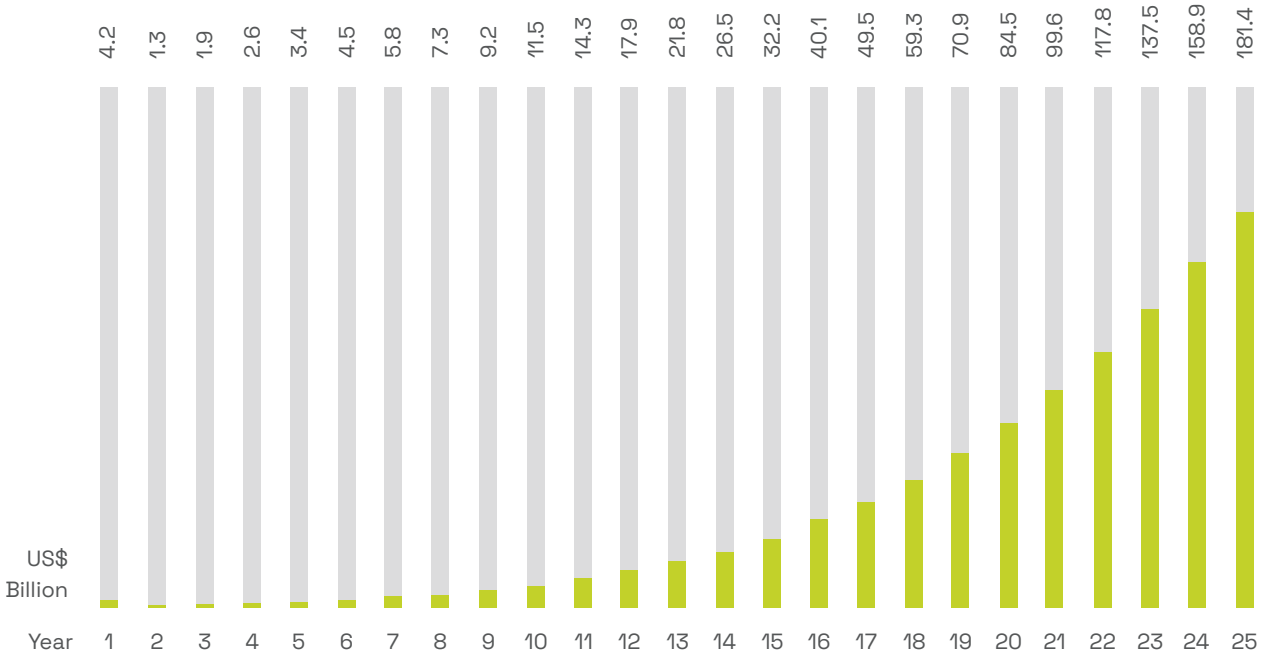
In this model, the researcher analyzes the economic impact of community-based renewable energy with the following assumptions:

- The average growth (CAGR-Compounded Annual Growth Rate) of micro-hydro capacity nationally in the last five years was 38.6% and gradually decreased until it reached 4.64% in the previous year. Micro-hydro generators are assumed to be 100% managed by the community.
- The average national growth (CAGR) of solar panel capacity in the last five years was 63.8% and decreased gradually to 21.83%. The community is assumed to contribute 40% to managing solar power plants.
- The average growth (CAGR) of the capacity of other renewable energy sources in the last five years nationally was 16.2% and decreased gradually to reach 0.21%. Different power plants are assumed to be fully managed (100%) by the community.

Photo: 350.org Indonesia

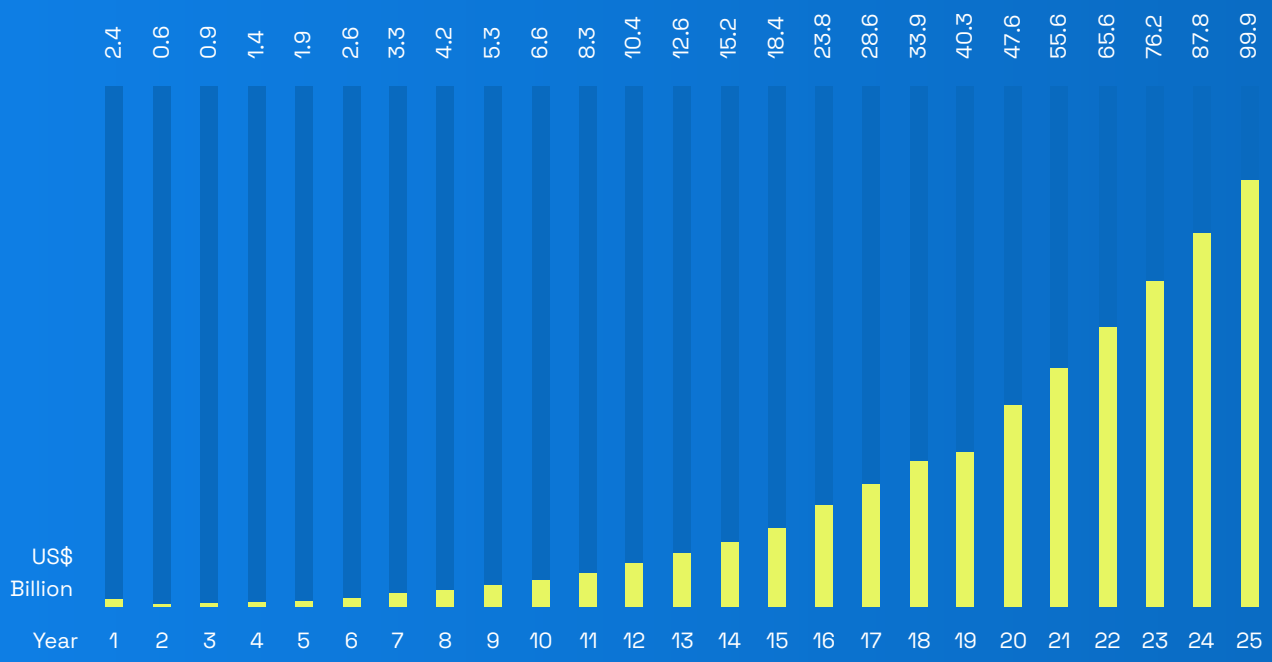
Economic Impact Analysis

Graph. Community-Based Renewable Energy Economic Output



In 25 years, economic output from community-based renewable energy development. It is estimated to grow at a CAGR of 16% with a cumulative value of US$ 1,164.72 billion or an average of US$ 46.59 billion annually. This growth is driven by several scenarios that can occur with the adoption of community-based renewable energy, such as employment in the installation and maintenance of solar/wind/water power generation facilities and the creation or increase in local industrial production in areas that have not previously been electrified (e.g., tourism, craft production, or even small to medium manufacturers for specific products).

Graph. Community-Based Renewable Energy GDP Impact



A similar trend is predicted to occur in GDP, estimated to grow by 16% (CAGR) within 25 years with a cumulative impact of US$ 653.92 billion or US$ 26.16 billion (average per year) from community-based renewable energy. Thus, in terms of GDP, this sector has the potential to contribute an average of 2% to economic growth each year in that period. With increased activity in developing renewable energy sources at the community level, investment can grow, especially in the clean energy and micro-scale finance sectors. Opening job opportunities in new sectors is also expected to support an increase in living standards and purchasing power, especially in areas that previously did not have electricity, some of which are under-developed, frontier, and outermost areas. Domestic consumption in regions supported by community-based renewable energy can also help develop a more stable energy supply to support productivity.

Table. Sectoral GDP Impact on Community-Based Renewable Energy

Sectoral Impact (US$ million)	GDP Value Added (5th year)	GDP Value Added (25th year)	CAGR
Agriculture, Forestry and Fisheries	59.21	3,725.60	23.01%
Processing industry	257.11	16,127.93	22.99%
Procurement of Electricity and Gas	629.56	20,951.78	19.15%
Water Supply, Waste Management, Waste and Recycling	0.88	40.49	21.13%
Construction	25.83	1,521.05	22.60%
Wholesale and Retail Trade; Car and Motorcycle Repair	126.37	7,789.92	22.88%
Transportation and Warehousing	71.18	4,781.04	23.41%
Provision of accommodation and food and drink	10.83	718.82	23.34%
Information and Communication	49.02	2,903.14	22.64%
Financial Services and Insurance	125.09	6,328.28	21.68%
Real Estate	13.40	977.98	23.93%
Company Services	124.98	5,812.86	21.17%
Government Administration, Defense, and Mandatory Social Security	10.71	565.05	21.93%
Education Services	2.62	193.16	24.00%
Health Services and Social Activities	3.72	1,200.17	33.49%
Other Services	7.65	485.54	23.07%
Others	405.62	25,856.02	23.09%
Total	**1,923.76**	**99,978.83**	**21.84%**

Community-based renewable energy is also expected to encourage development in various economic sectors. In general, community-based renewable energy investment can increase equitable access to energy, especially in areas that previously did not enjoy a reliable electricity supply. As a result, these regions would have opportunities to improve labor absorption and labor productivity. These two positive trends are mainly supported by the ease of running a business and decreasing operational costs, which unreliable energy supplies have driven.

Table. Development of GDP Value Added in the 5th and 25th Years

Province	GDP Value Added year 5 (US$ million)	GDP Value Added year 25 (US$ million)	CAGR
Aceh	26.49	237.35	12.2%
North Sumatera	68.70	1,134.78	15.9%
West Sumatera	38.69	372.95	12.7%
Riau	46.19	629.31	14.7%
Jambi	51.86	503.44	12.7%
South Sumatera	200.19	3,545.82	16.3%
Bengkulu	70.52	427.71	10.0%
Lampung	12.48	316.99	18.6%
Bangka Belitung Islands	1.87	22.60	14.0%
Riau Islands	13.89	361.39	18.7%
DKI Jakarta	137.01	8,346.27	24.1%
West Java	426.23	5,651.02	14.6%
Central Java	103.96	12,309.73	28.6%
DI Yogyakarta	5.47	293.99	23.3%
East Java	93.05	5,667.96	24.1%
Banten	99.25	1,940.90	16.9%
Bali	3.63	522.93	29.9%
West Nusa Tenggara	33.36	5,955.19	31.4%
East Nusa Tenggara	13.84	4,278.26	35.2%
West Kalimantan	6.61	245.59	21.0%
Central Kalimantan	5.97	339.50	23.7%
South Kalimantan	4.08	267.16	24.6%
East Kalimantan	236.48	25,385.96	27.9%
North Kalimantan	9.23	1,130.62	28.8%
North Sulawesi	20.43	7,995.41	36.9%
Central Sulawesi	15.51	377.67	18.3%
South Sulawesi	51.20	2,731.54	23.3%
Southeast Sulawesi	5.68	199.62	20.6%
Gorontalo	10.15	4,018.76	37.0%
West Sulawesi	5.83	75.77	14.4%
Maluku	7.10	347.24	22.7%
North Maluku	1.63	429.83	34.1%
West Papua	91.01	2,532.02	19.1%
Papua	6.16	1,383.65	33.0%
Indonesia	**1,923.76**	**99,978.83**	**23.1%**

Based on our economic model estimates, increases in GDP from community-based renewable energy could be realized across all provinces, and several provinces—-especially in the eastern part of Indonesia—-are projected to grow above average.

This trend can occur due to eastern Indonesia's enormous potential for economic growth, which is still hindered by suboptimal electricity access. Several places in the eastern region are still not fully electrified, and the electricity supply to these areas is still not stable and reliable enough.[5] Ironically, the western region of

5 Primantoro, A. Y. (August 2023). Electrification Calculation Standards Are No Longer Relevant.Kompas.Id. https://www.kompas.id/baca/ekonomi/2023/08/22/standar-perhitungan-elektrifikasi-dinilai-tak-lagi-relevan

Indonesia (especially Java, Sumatra, and Bali) is currently experiencing an excess supply of PLTU electricity[6], whose coal is produced in the eastern region of Indonesia. It can be said that this condition reflects the difficulty of managing large-scale electricity sources, which are very dependent on economic growth assumptions.[7] If these assumptions are not met, the consequences of excess electricity in the form of PLN losses and the burden on state finances can be consequential.

Therefore, the above-average growth that can occur from implementing community-based renewable energy, which can reflect more equitable access to electricity and improvements in the quality The electricity that communities in eastern Indonesia can enjoy through community-based renewable energy is a significant departure from the traditional energy development parad.m,m This paradigm has often been too focused on large-scale projects (base load), neglecting the needs of local community members who are geographically close and may still need a stable electricity supply. The possibility of excess electricity production is more diminutive with community-based renewable energy, making it a more sustainable and efficient solution.

Case Study: Micro-Hydro Boosts Agricultural Productivity and Reduces the Cost of Living

The benefits of developing renewable energy include the development of the agricultural sector and reducing the cost of living. "Before there was a micro hydro power plant, there was no lighting in this village," said Pak Tohar, a resident of Gunung Sawur, Lumajang Regency, East Java.[8] "Now, not only lighting, but residents can also produce salak chips, a typical Lumajang snack, with electricity from the micro hydro."

The micro-hydro on Mount Sawur brings fortune to the surrounding community. Now, they can access affordable electricity. The average household expenditure on electricity is only around US$3.1. For the residents of Gunung Sawur, accessible electricity has become a reality.

Renewable electricity is not only available in Mount Sawur, Lumajang. Community-based renewable energy also exists in West Java, precisely in Kasepuhan Ciptagelar. In this area, indigenous communities have been using microhydro since 1988. Indigenous communities in Ciptagelar have utilized the Cisono and Cibareno Rivers' water flow to produce electricity distributed to thousands of homes.

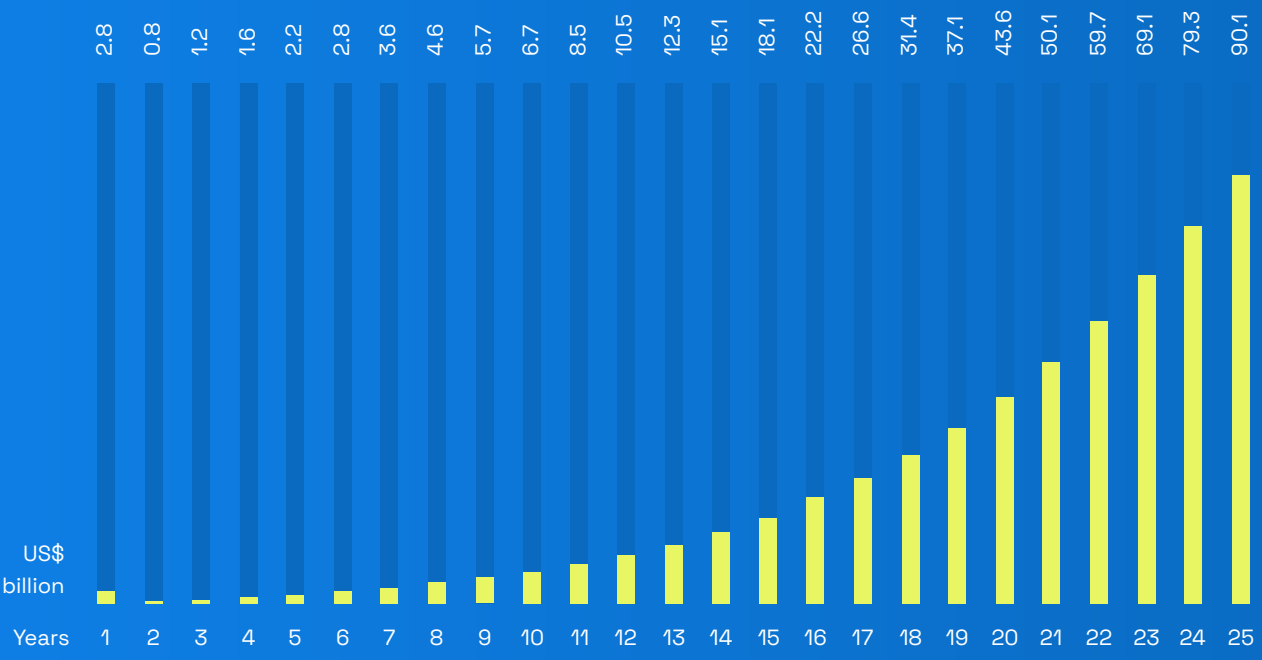
Outside Java, precisely in Ban Village, Kubu District, Karangasem, a solar power plant (PLTS) has supplied electricity for 17 families and three public facilities, including religious buildings. Another solar plant operates in Muara Enggelam, Kutai Kartanegara Regency, East Kalimantan. This solar plant has a 30-kilowatt peak (kWp) capacity and has been operating since February 1, 2015. In total, 152 households and public facilities subscribe to the electricity generated from this solar plant.

6 Setiawan, V. N. (September 2022). The danger of Indonesia's excess electricity will persist until 2030.CNBC Indonesia. https://www.cnbcindonesia.com/news/20220930145008-4-376296/bahaya-kelebihan-listrik-ri-akan-menjadi-jadi-sampai-2030

7 CNBC Indonesia. (September 2022). So that you understand, this is the culprit that causes PLN to have excess electricity.CNBC Indonesia. https://www.cnbcindonesia.com/news/20220927154843-4-375369/biar-paham-ini-biang-keladi-yang-bikin-pln-kelebihan-listrik

8 Firdaus cahyadi, Indonesia team lead interim 350.org, Akankah JETP Mendukung Energi Terbarukan Berbasis Komunitas?, https://omong-omong.com/akankah-jetp-mendukung-energi-terbarukan-berbasis-komunitas/. Retrieved 05 September 2024.

Graph. Business Profit from Community-Based Renewable Energy



Furthermore, community-based renewable energy is projected to provide a business surplus for business actors with a cumulative estimate of US$606.90 billion or an average of US$24.28 billion over 25 years. This can be realized by opening opportunities for more parties, such as cooperatives, BUMDes (village enterprise), and micro-scale businesses, to compete and create added value in the energy sector. This answers whether community-based energy is effective in making profits for small companies in aggregate.

Several large players currently dominate the national energy system. Energy decentralization can be realized with support for small and medium enterprises (SMEs) and local communities. Simple component production activities and installing and maintaining renewable energy sources will benefit SMEs economically. Furthermore, energy decentralization can also develop the potential for small—to medium-scale manufacturing industries, including household craft industries.

Table. Sectoral Business Surplus

Sectoral Impact (US$ million)	Business Surplus (5th year)	Business Surplus (25th year)	CAGR
Agriculture, Forestry and Fisheries	48.02	2,528.21	21.92%
Processing industry	245.43	12,411.02	21.92%
Procurement of Electricity and Gas	951.40	29,818.06	18.80%
Water Supply, Waste Management, Waste and Recycling	-0.89	22.72	N/A
Construction	21.90	1,067.09	21.45%
Wholesale and Retail Trade; Car and Motorcycle Repair	104.02	5,376.40	21.81%
Transportation and Warehousing	65.09	3,565.53	22.16%
Provision of accommodation and food and drink	8.42	448.59	21.99%
Information and Communication	43.02	2,084.73	21.41%
Financial Services and Insurance	111.23	4,474.16	20.29%
Real Estate	11.87	745.17	22.99%
Company Services	120.13	3,819.38	18.88%
Government Administration, Defense, and Mandatory Social Security	7.26	329.13	21.01%
Education Services	1.64	87.37	21.99%
Health Services and Social Activities	2.31	545.00	31.42%
Other Services	6.16	305.53	21.55%
Others	415.56	22,465.43	22.08%
Total	**2,162.57**	**90,093.50**	**20.50%**

Community-based renewable energy development can benefit business actors of up to US$ 90.09 billion in the 25th year, assuming growth of 20.5% CAGR. The business sector that benefits most is electricity procurement, the processing industry related to producing renewable energy components, and the small-scale industry that benefits from clean electricity. The trade sector is estimated to have a surplus of up to US$ 53.8 billion in the 25th year related to transportation needs for component delivery and other multiplier impacts throughout the trade chain.

The country also benefits from community-based energy, reflected in net tax revenues. The model estimation shows that the value of tax revenue received has been more significant than the subsidies and incentives provided, even since the first year. Tax revenue value will increase along with implementing policies that support sustainable community-based renewable energy, with a cumulative figure of US$12.37 billion or an average of US$0.49 billion annually.

Graph. Net Tax Gain

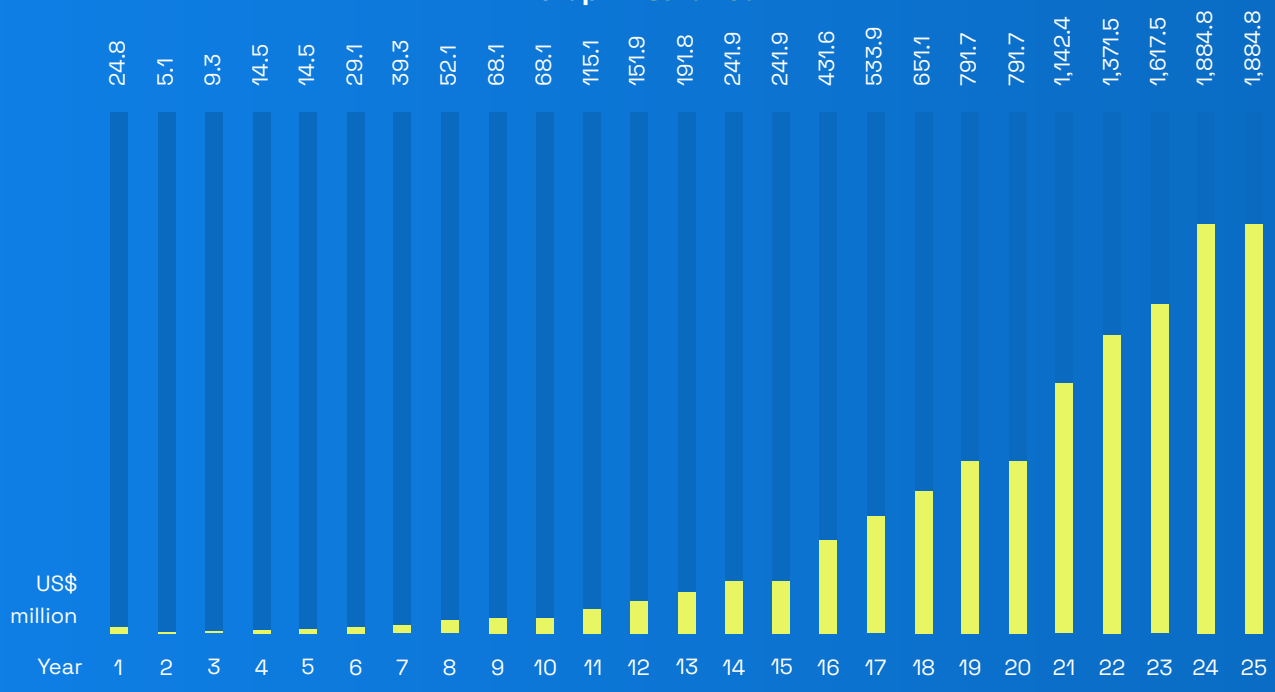
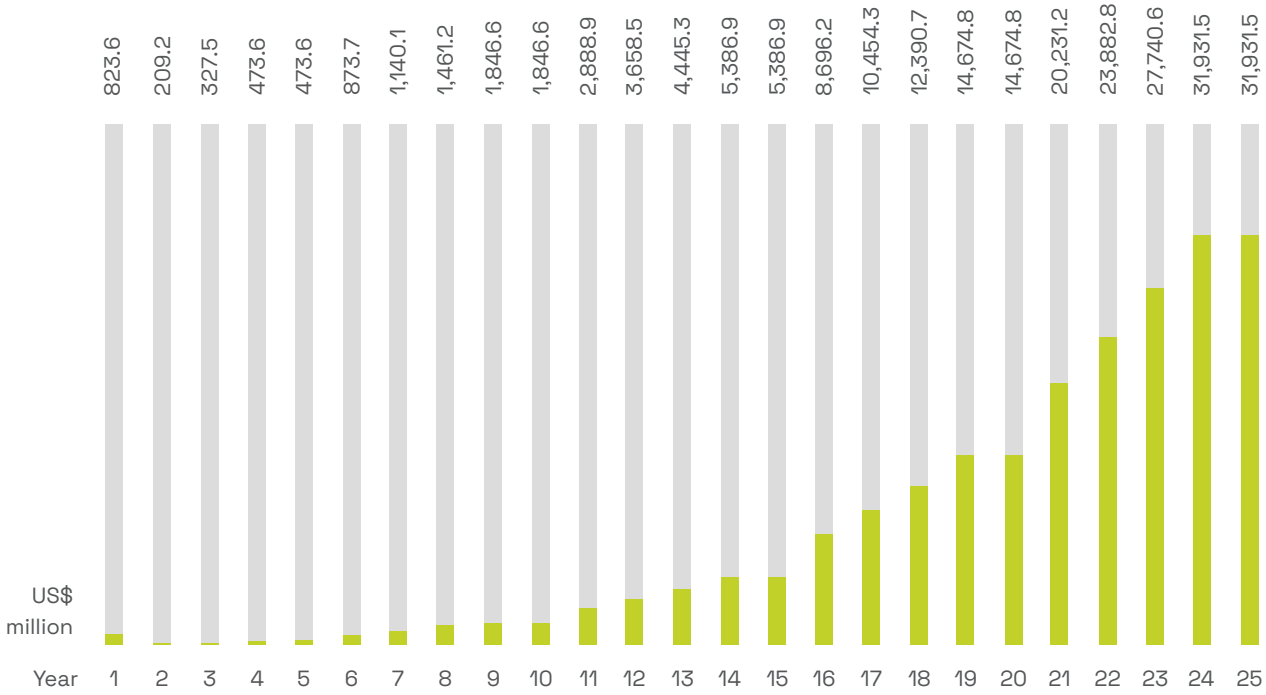


Photo: CELIOS

Impact on Worker Conditions

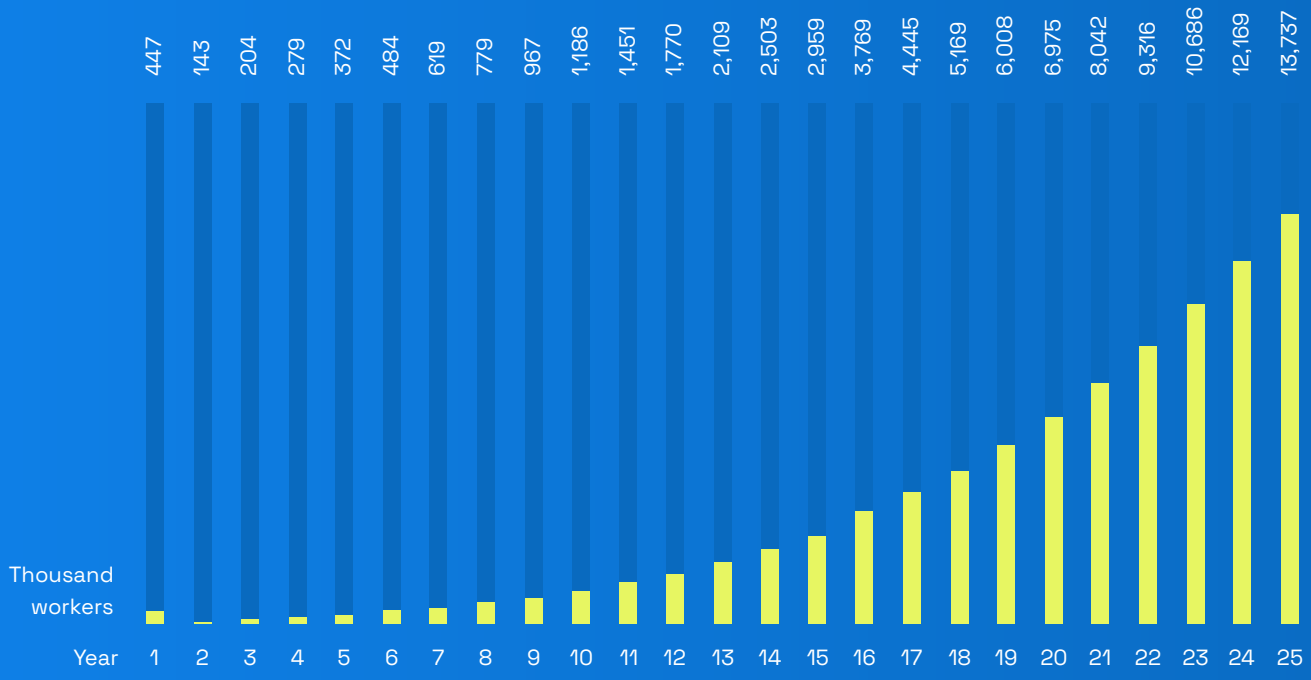
Graph. Impact on Workers' Income



Optimal community-based renewable energy financing can positively affect worker conditions. **During the 25 years of implementing this policy, workers' income increased yearly until it reached US$9.11 billion in the 25th year. The total worker income generated from this policy reached US$227.85 billion in that period.**

The increase in workers' income comes from increased job absorption and opportunities for work requiring specialized skills. Renewable energy financing accompanied by systematic education and training spread across various regions can increase workers' total aggregate income. The government must prepare for vocational training needs, use BLK (Job Training Centers) and skills certification programs, and include knowledge related to renewable energy in the primary education curriculum.

Graph. Labor Absorption



The benefits of community-based renewable energy financing can also increase national workforce absorption. Total worker absorption will produce a positive trend over 25 years of policy implementation. In the 25th year, they can substantially absorb more than 13 million workers in one year. **This policy will result in total employment of more than 96 million people within 25 years.**

Table. Sectoral Labor Absorption

Economy Sectors (Thousands of Workers)	Worker Absorption (5th Year)	Worker Absorption (25th Year)	CAGR
Agriculture, Forestry and Fisheries	15,000	974,000	23%
Processing industry	41,000	1,360,000	22%
Procurement of Electricity and Gas	174,000	2,012,000	21.5%
Water Supply, Waste Management, Waste and Recycling	0	4,211,000	17.3%
Construction	3,000	5,000	19.6%
Wholesale and Retail Trade; Car and Motorcycle Repair	29,000	144,000	20.6%
Transportation and Warehousing	10,000	1,628,000	22.3%
Provision of accommodation and food and drink	2,000	581,000	22.3%
Information and Communication	8,000	134,000	22.8%
Financial Services and Insurance	26,000	348,000	20.6%
Real Estate	2,000	829,000	18.9%
Company Services	30,000	99,000	22.5%
Government Administration, Defense, and Mandatory Social Security	3,000	966,000	19%
Education Services	1,000	107,000	20.1%
Health Services and Social Activities	1,000	41,000	23.5%
Other Services	1,000	226,000	33.6%
Others	26,000	73,000	22.5%
Total	**372,000**	**13,737,000**	**19.8%**

The types of jobs generated through community-based renewable energy financing policies are similar to those in the renewable energy industry. The electricity and gas procurement business sector will absorb the largest workforce. Therefore, renewable energy will generate many jobs in the manufacturing and distribution of renewable energy equipment, project development, construction and installation, operations and maintenance, and common cross-sectoral areas.[9] Additionally, increasing job absorption is anticipated in all sectors to tackle unemployment.

Apart from education and training, commitment and stable policy must support this positive trend, for example, in terms of more ambitious and unrevised energy transition targets.

9 Malamatenios, C. (2016). Renewable energy sources: Jobs created, skills required (and identified gaps), education and training. Renew. Energy Environ. Sustain., 1. https://heinonline.org/HOL/LandingPage?handle=hein.journals/sdjclimel4&div=9&id=&page=

Job Opportunities from Community Scale Renewable Energy Benefits

Photo: Pexels.com

Mr. Winarno, as written by Adam Husni, Climate Rangers Surabaya[10], owns a snake fruit chips and fruit juice drink business. His first business was in Pronojiwo, Lumajang. He has only been using electricity from the micro hydro for about 4-5 months. Pak Win, as he is familiarly known in the village, uses excess electricity generated from the micro-hydro to build a second business/ production site in the Gunung Sawur area. He uses electricity for water pumps, freezers, fryers, spinners, vacuum pumps, blowers, etc.

Thanks to electricity from a micro-hydro, Pak Win's business can now produce 150 packs of snake fruit products daily. He can also hire more workers and employ residents. The company currently has 12 employees.

According to one of the workers at Pak Win, the food processing is carried out from morning to afternoon. Meanwhile, packaging is carried out in the late afternoon and evening to minimize electricity usage by the business since those times are the peak electricity usage by all residents.

"The women who live close to the factory are employed in the factory while the youth tend the farm and field to make ends meet," he said.

10 Adam Husni, Climate Rangers Surabaya, PLTMH and the potential of village residents in Lumajang, 2023.

Impact on Job Absorption

Table. Labor Absorption

Province	Worker Added (5th year)	Worker Added (25th year)
Aceh	6,000	42,000
North Sumatera	10,000	146,000
West Sumatera	10,000	72,000
Riau	10,000	83,000
Jambi	6,000	54,000
South Sumatera	26,000	285,000
Bengkulu	123,000	570,000
Lampung	2,000	38,000
Bangka Belitung Islands	1,000	3,000
Riau Islands	3,000	34,000
DKI Jakarta	17,000	674,000
West Java	41,000	654,000
Central Java	24,000	2,311,000
DI Yogyakarta	1,000	57,000
East Java	12,000	681,000
Banten	21,000	254,000
Bali	1,000	79,000
West Nusa Tenggara	7,000	1,300,000
East Nusa Tenggara	5,000	1,711,000
West Kalimantan	1,000	39,000
Central Kalimantan	1,000	48,000
South Kalimantan	1,000	29,000
East Kalimantan	15,000	1,395,000
North Kalimantan	1,000	2,000
North Sulawesi	3,000	1,138,000
Central Sulawesi	2,000	48,000
South Sulawesi	11,000	340,000
Southeast Sulawesi	1,000	28,000
Gorontalo	2,000	938,000
West Sulawesi	1,000	10,000
Maluku	2,000	91,000
North Maluku	1,000	184,000
West Papua	4,000	102,000
Papua	1,000	206,000
Indonesia	**372,000**	**13,737,000**

The absorption of the local workforce in each region assumes that the committed development of renewable energy has a positive effect in all provinces. Since the fifth year alone, job absorption is anticipated to have been evenly distributed in all provinces, resulting in more than 371 thousand people being employed nationally. This projection shows that community-based energy financing policies can generate labor absorption, opening job opportunities in many regions, including provinces outside Java, such as Aceh and Papua.

The 25th year, which would create jobs for workforces of more than 13 million people, also shows a relatively even distribution of job

absorption. Even though job absorption could decrease within several provinces within that year, total job absorption is forecasted to be still significant in all provinces. This proves that community-based renewable energy financing policies, as part of the green economy agenda, could produce more sustainable employment.

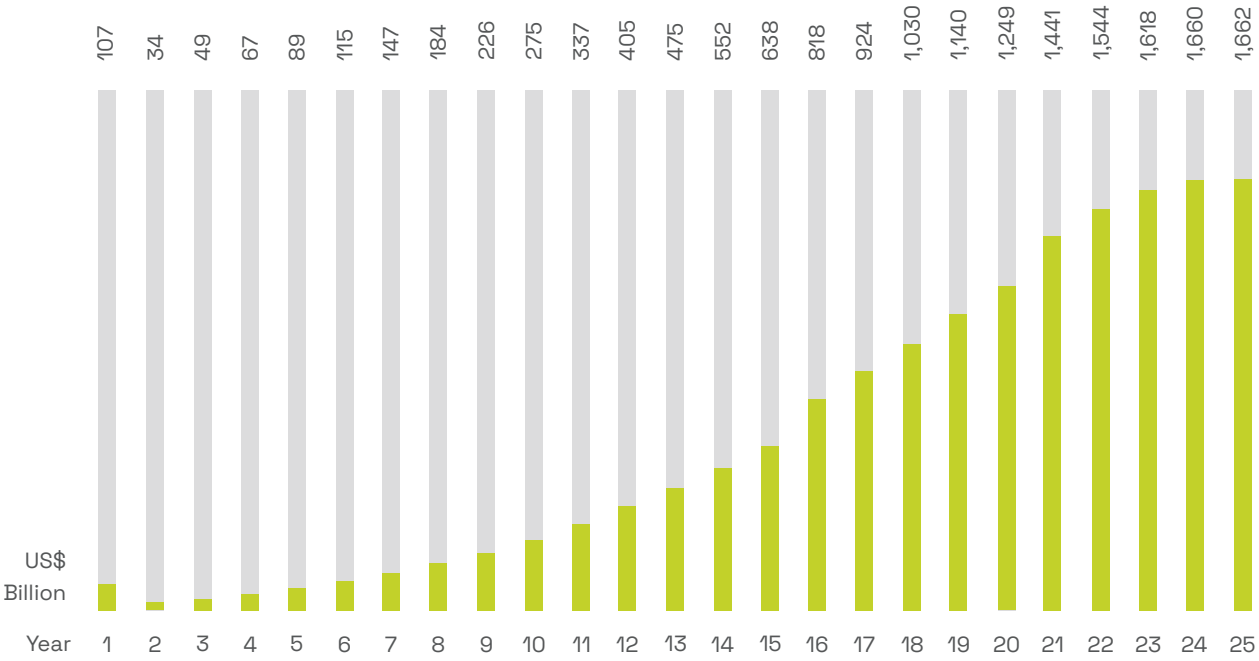
This sustainability is related to the positive impact of this policy on all business sectors, according to the findings of the Celios study[11] in 2023 concerning the Impact of the Green Economy on the Indonesian Economy, Equity, and Welfare. The study revealed that in 10 years, the green economy will increase job income by US$56.2 billion and labor absorption by 19.4 million in all business sectors. Therefore, the provincial government can continue aligning this policy with its region's priority business sectors.

Photo: CELIOS

11 Greenpeace & CELIOS. (2023). The Impact of the Green Economy on the Indonesian Economy, Equity and Prosperity. Greenpeace & CELIOS. https://celios.co.id/2023/efek-positif-transisi-ekonomi-hijau-terhadap-indikator-ekonomi/

Impact on Poverty and Inter-Regional Inequality

Graph. Impact on Poverty Rates



The positive impact of community-based renewable energy can also reduce national poverty levels. The simulations carried out show that in 25 years, the financial penetration for community-based renewable energy will be able to reduce poverty right from the start of implementation. **In fact, in 25 years, the implementation of this policy will be able to reduce the poverty rate by more than 16 million people.** This projection demonstrates that community-based renewable energy can help alleviate national poverty, which, according to BPS data for 2023[12] had reached 25.9 million.

The contribution of this policy in reducing poverty is through the increased GDP, increased business profits, increased worker income, and job creation. In addition, reductions in energy costs from using renewable energy means that we can free up more resources to support other sectors, such as improvement in welfare policy and poverty alleviation. According to IRENA[13] in Indonesia Energy Transition Outlook released in 2022, using new and renewable energy in Indonesia can save costs of up to US$400-600 billion or equivalent to IDR 6,400-9,600 trillion.

12 BPS (2023), Penghitungan dan Analisis Kemiskinan Makro 2023, https://www.bps.go.id/id/publication/2023/11/30/8b8dac76525a92a21dc6568a/penghitungan-dan-analisis-kemiskinan-makro-indonesia-tahun-2023.html

13 IRENA. (2022). Indonesia Energy Transition Outlook. IRENA. https://www.irena.org/Publications/2022/Oct/Indonesia-Energy-Transition-Outlook

Regional Study of Micro Hydro in Kedungrong, Special Region of Yogyakarta.

Efforts to utilize Micro Hydro in Kedungrong have had a positive and important impact on its residents. As written by Ade Zahra Putri A & Audia Nuriasari from CR Yogyakarta[14], residents no longer depend on energy supplies from outside their area. They are able to generate energy that fulfills local needs independently. This makes Kedungrong an energy-self-sufficient village. This is a form of energy sovereignty at the grassroots level.

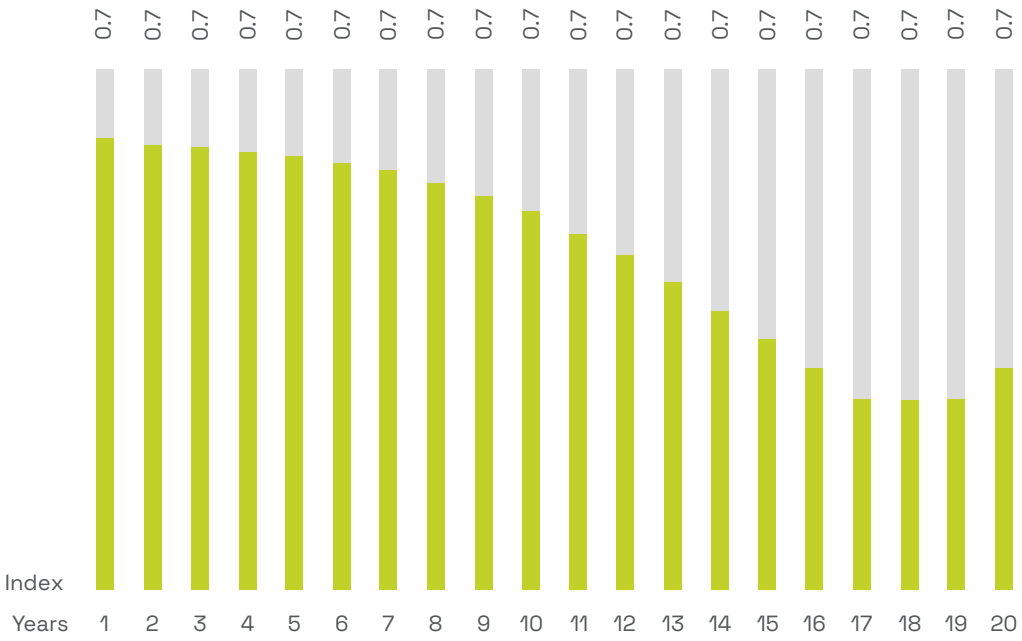
This energy independence brings many benefits to the residents. Apart from being useful for supplying electricity to residents' homes, this Micro Hydro also has a positive and vital impact on the economy of the people in Kedungrong. For example, residents actively use the electricity supply from this generator for welding, workshops, and food stalls. In essence, the electricity supply produced from renewable energy power plants is very useful not only for people's daily electricity needs but also for their economic activities.

"Using electricity not only applies to household needs but also to businesses. For example, Mr. Supri uses electricity to fulfill various processes in making wood trim, as all his carpenter's tools use electricity. "Apart from that, electricity costs are only IDR 12,000 (US$ 0.75)/35 days," said Rejo. According to him, the use of Micro Hydro contributes to economic growth in the area. "The more small businesses that can use electricity at affordable costs, the greater the opportunity for economic growth in the area," he concluded.

According to Rejo, residents who own a home industry are also greatly helped by the minimal operational costs they incur. Thus, this triggers significant local economic growth. "Another benefit that certainly results from the use of Micro Hydro in Kedungrong is that this also contributes to reducing pollutants resulting from the energy industry," he said, "Using Micro Hydro is an effort for a renewable energy solution whose impact can be felt in real terms." The positive changes felt by the community continued Redjo are the real impact of pollutant-free renewable energy solutions. Therefore, the decision to use Micro Hydro as an energy source to meet the energy needs of Kedungrong is a favorable decision that has a real impact.

14 Ade Zahra Putri A & Audia Nuriasari, CR Yogyakarta, Cheap Electricity from Kedungrong Hamlet, 2023

Graph. Williamson Index



The Williamson Index measures regional disparities in development. The further the index number moves away from 0, the greater the inequality between regions. Inter-regional inequality due to community-based renewable energy financing policies looks quite positive. In the first 20 years of implementation, the index decreased from 0.74 to 0.70.

The decrease in the index during the policy implementation period was due to increased opportunities for access to financing that are not limited to large-scale companies. Even though the decline is not too significant, at least the positive economic impact that occurred in the previous discussion, namely on economic output, GDP, business profits, tax revenues, and employment, did not result in an increase in inequality between regions.

Community-Based Renewable Energy Funding Opportunities

In discussing the energy transition and energy security, the critical role of communities as key actors is often underestimated. However, Indonesia's geographic challenges, characterized by being an archipelagic country, require communities to be the vanguard in developing access to clean energy. Indonesia is recorded as having 83,794 villages or administratively equivalent villages in 2022. However, in the master plan or international cooperation such as JETP (Just Energy Transition Partnership), villages and similar communities are not involved.

Community-based renewable energy can be defined as a renewable energy generation initiated, maintained, and supported by communities that live in close geographical proximity to renewable sources and use their shared resources.[15]

The International Renewable Energy Agency (IRENA) stated that community-based energy ownership has a number of potential benefits, including increased distribution of renewable energy sources and lower energy costs for members of the community concerned.[16] The community-scale renewable energy adoption strategy has advantages that can overcome the disadvantages of household-level adoption where the impact tends to be small[17] in accruing critical mass towards a clean energy transition. This strategy also has advantages over large-scale renewable energy projects that typically cause energy sprawl problems.[18,19] As it happens, energy sprawl can conflict with the environmental goals of renewable energy development because increasingly massive land use can threaten biodiversity preservation due to damage to the natural habitat of various species around the used land.

In addition, the strategy of leveraging community presence is important because in order to support a just energy transition–and for a number of other reasons–the commercial success and funding of corporate entities focused on renewable energy are not the only pathway that needs to be achieved.

First, with the current price of commercially viable renewable energy sources, only a limited number of people can afford to adopt them. So, if we only focus on segments that have sufficient purchasing power, the energy transition can only be enjoyed by a limited number of people.

This reasoning is also related to awareness and readiness for the energy transition, which is still limited to some segments and even to some

15 Bronin, S., & Wiseman, H. (2013). Community-Scale Renewable Energy. SAN DIEGO JOURNAL OF CLIMATE & ENERGY LAW, 14, 165–166. https://heinonline.org/HOL/LandingPage?handle=hein.journals/sdjclimel4&div=9&id=&page=

16 IRENA. (2020). COMMUNITY- OWNERSHIP MODELS INNOVATION LANDSCAPE BRIEF. IRENA. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Community_ownership_2020

17 Bronin, S., & Wiseman, H. (2013). Community-Scale Renewable Energy. SAN DIEGO JOURNAL OF CLIMATE & ENERGY LAW, 14, 165–166. https://heinonline.org/HOL/LandingPage?handle=hein.journals/sdjclimel4&div=9&id=&page=

18 Terminologi energy sprawl digunakan untuk mendeskripsikan peningkatan penggunaan lahan untuk keperluan produksi energi (lihat Trainor, A. M., McDonald, R. I., & Fargione, J. (2016). Energy sprawl is the largest driver of land use change in United States. PloS One, 11(9), 1. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0162269)

19 Bronin, S. C. (2010). Curbing energy sprawl with microgrids. Conn. L. Rev., 43, 547. https://heinonline.org/HOL/LandingPage?handle=hein.journals/conlr43&div=17&id=&page=

regions. The latest study from CELIOS found that 90% of provinces in Indonesia are not ready to undertake the energy transition.[20] Community funding can help overcome this gap in community capacity in adopting renewable energy, especially in areas with inadequate levels of preparedness.

Community-based funding can help overcome this gap, especially in areas where communities still have solid communal structures. A community-based approach emphasizes initiative and a sense of community ownership (bottom-up) to build and maintain renewable energy infrastructure in the region. A number of initiatives can serve as examples of successful community-based approaches. As an illustration, in one of the villages that have not been fully electrified in Blora Regency, there is an initiative initiated by local leaders to build a simple wind power plant using materials available in the local area and involving the community in the construction so that the village can finally receive electricity for the village roads' lighting.[21] This initiative is still running consistently today with the support of the local community.

On the other hand, government programs that are top-down in nature in several areas, such as Sinjai Regency and Papua, were implemented by distributing free solar panels to the public, and up until now, they have yet to succeed in gaining support from the community. In fact, many of the solar panels that were distributed were damaged, stalled, or ironically even used to dry clothes because there was no continued support in the form of a maintenance budget from the local government.[22,23] It can be said that centralized initiatives generally have short sustainability because they are very dependent on the commitment of local governments, and the community needs to have the desire to undertake maintenance of facilities provided by the government. If given the opportunity to build their own infrastructure, communities like those that have yet to be successful in enjoying electricity in their area will have more incentive to maintain the facilities they have built and use themselves.

Another argument that supports the need for a roadmap for community-based adoption of renewable energy sources is that communities have more incentives to preserve their environment. This is especially true for communities that have a strong dependence on the surrounding natural ecosystem. Various conflicts that arise from land clearing activities for large-scale energy projects (base load) are evidence that consistently shows how communities in the area around the land have an interest in maintaining the condition of the surrounding environment in development activities. Thus, community involvement in Indonesia's energy roadmap can be an effective strategy for developing renewable energy infrastructure that is truly environmentally oriented.

The potential of community-based renewable energy can be realized in Indonesia if its implementation is supported by a reliable supply of affordable funding.

20 CELIOS. (2024). Indonesia Energy Transition Readiness Index. CELIOS. https://celios.co.id/2024/indeks-kesiapan-transisi-energi-indonesia/

21 Pradana, A. R., & Kurniati, P. (January 2024). The story of Noer Chanif, a vocational school teacher in Blora who created a wind and solar power plant for street lighting.Kompas.Com. https://regional.kompas.com/read/2021/08/28/092243778/kisah-noer-chanif-guru-smk-di-blora-yang-ciptakan-pembangkit-listrik-tenaga?page=all#google_vignette

22 Erlangga, D. (October 2020). Damaged and stalled solar plants in Sembilan Sinjai Islands, where is the problem?Mongabay.Co.Id. https://www.mongabay.co.id/2020/10/16/rusak-dan-mangkraknya-pembangkit-surya-di-kepulauan-sembilan-sinjai-dimana-masalahnya/

23 CNN Indonesia. (June 2022). PLN Papua Project Stalls, Electrical Cables "Transformed" into Clotheslines.CNN Indonesia. https://www.cnnindonesia.com/ekonomi/20220607102116-85-805750/proyek-pln-papua-mangkrak-kabel-listrik-disulap-jadi-jemuran-baju

Therefore, community-based funding can be a strategy that can encourage accelerated use of renewable energy if it is executed with the involvement of communities, social capital, and resources that can be utilized to reduce the risks of energy development projects in related areas, which can then be translated into lower funding costs.

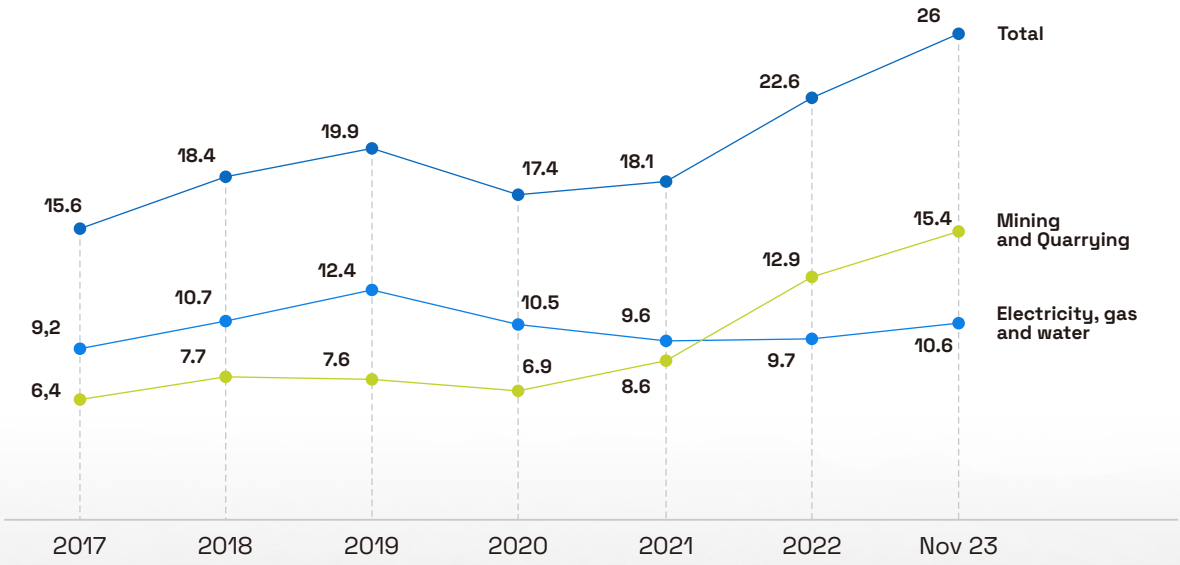
The potential for community-based funding is still relatively large. Until now, there is still not an ample supply of funds aimed at community activities, and there are still a number of challenges in collecting community-based renewable energy financing, as will be explained below.

A. Bank Loan

Apart from green financing (green loan), which, according to OJK (Indonesia Financial Service Authority), has now reached US$50.6 billion, there is a huge capacity of loans from the mining, excavation, and electricity procurement sectors, which can be reallocated to finance renewable energy with a total value of up to US$26 billion per November 2023.

The Indonesian Ministry of Energy and Natural Resources estimates that the energy transition in 2060 will cost up to US$1 trillion or around IDR 16,000 trillion[24]. Meanwhile, total banking financing to the mining and quarrying sector, as well as electricity, gas, and water, in the last year has reached US $ 25 billion, or around 3 percent of the total energy transition funding needs.

Graph 1: Value of Credit/Financing from Commercial Banks to Non-Bank Third Parties for the Mining and Electricity, Gas and Water Sectors (in US$ billion) 2017-November 2023



Source: Indonesian Economic and Financial Statistics December 202[25]

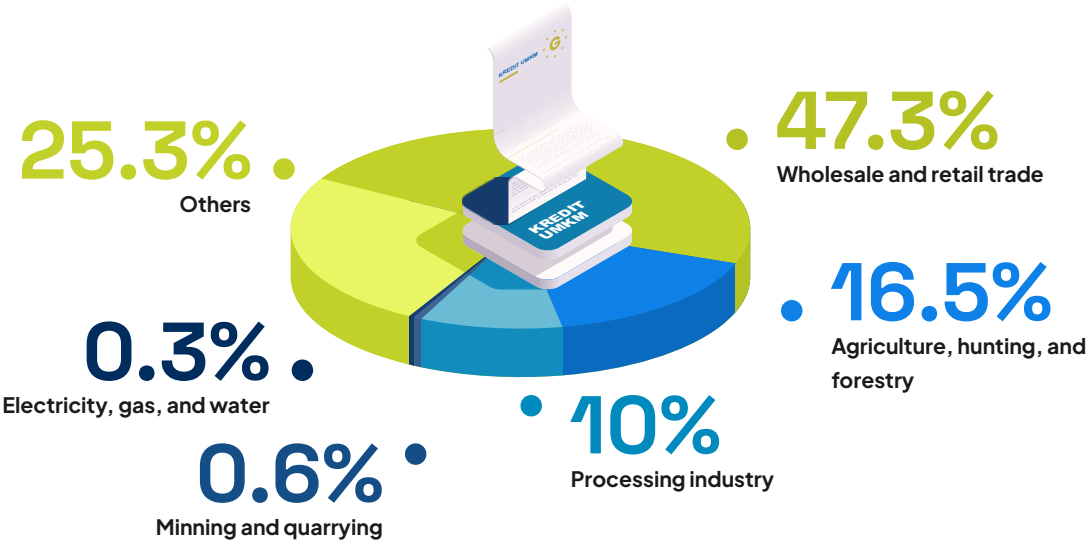
24 Indonesia Ministry of Energy and Mineral Resources. (September 2022). Energy Transition Requires Huge Costs, Government Invites Business people to Invest. https://www.esdm.go.id/id/media-center/arsip-berita/transisi-energi-butuh-biaya-besar-pemerintah-ajak-pebisnis-investasi

25 Bank Indonesia. (December 2023). SEKI-DECEMBER-2023.

Small businesses and community activities can be encouraged to take part in the energy transition sector. One example is the pioneering project in Gunungkidul[26] which is an effort to initiate the use of solar power plants (PLTS) in rural areas. In the future, similar programs can be expanded and executed by more community units with support from Micro, Small, and Medium Enterprises (SMEs) to pioneer more massive adoption of renewable energy sources. So, one source of financing that can be distributed is People's Business Credit (KUR), along with other credit aimed at SMEs.

Even though up to now, SME loan distribution that is explicitly aimed at the energy sector is still minimal, as of October 2023, SME financing distributed to the mining and quarrying as well as electricity, gas, and water sectors reached IDR 12.5 trillion (US$781 million).[27] **(see Graph 2)**. The shares of 0.3% are very far from the total funding requirements for the energy transition until 2060, but accelerated adoption at the community level can help accrue the critical mass needed to accelerate the adoption of renewable energy. For example, it can procure thematic funding for the adoption of renewable energy sources within the community as one of the sectors financed by SME credit. KUR financing can be an attractive alternative for the SME sector and the community, considering the incentives currently provided by the government through KUR margin subsidies.[28]

Graph 2:Portion of SME Credit by Sector Financed by October 2023



Source: Indonesian Banking Statistics October 2023[29]

26 Sucahyo, D. (2022, February). PLTS for SMEs: Small Initiative for Implementing New Renewable Energy.VOA Indonesia. https://www.voaindonesia.com/a/plts-untuk-umkm-prakarsa-kecil-penerapan-energi-baru-terbarukan/6430542.html

27 Financial Services Authority. (2023).Indonesian Banking Statistics—October 2023 [dataset]. https://ojk.go.id/id/kanal/perbankan/data-dan-statistik/statistik-perbankan-indonesia/Pages/Statistik-Perbankan-Indonesia---Oktober-2023.aspx

28 SIARAN PERS HM.4.6/388/SET.M.EKON.3/10/2023 (2023). https://www.ekon.go.id/publikasi/detail/5417/mitigasi-risiko-dampak-el-nino-pemerintah-dorong-implementasi-kredit-usaha-alat-dan-mesin-pertanian#:~:text=Dengan%20telah%20terbitnya%20Keputusan%20Menteri,dibandingkan%20dengan%20Semester%20I%202023.

29 Financial Services Authority. (2023).Indonesian Banking Statistics—October 2023 [dataset].

B. Cooperative Financing

Cooperative financing is an alternative to community-based renewable energy funding. As a community-based financial service, cooperatives can be a means of channeling funding for the adoption of renewable energy sources, for example, at the village or sub-district level or small community units.

Although there are still a number of challenges in mobilizing cooperatives to support renewable energy initiatives, so far, there have been examples of renewable energy-themed financing programs organized by several cooperatives, including:

1. BIRU Program[30]

his program is a collaboration between the Rumah Energi Foundation (YRE) with cooperatives and credit provider institutions, which aims to support the energy transition through the production and supply of biogas.

It facilitates several schemes: Business to Business (B to B) and Business to Consumer (B to C). The target of this program is biogas users and biogas business entities.

A number of credit institutions that have contributed to this program in recent years include YRE, Hivos (both of which have established strategic partnerships with institutions such as the Rabobank Foundation, Savings and Loans Cooperative, KIVA, Inkopdit (Parent of Credit Cooperatives), and LPDB (Revolving Fund Management Institution) to provide access to biogas credit.

Achievements of this program include:

- A total of 9,289 households in 5 (five) provinces received access to biogas credit.
- Partnership with more than 35 cooperatives for biogas installation credits. The collaboration includes a partnership with Nestle Indonesia, which since 2010 has supported access to domestic biogas technology with interest-free credit for cooperative members through a program called Corporate Share Value (CSV). A total of 30,000 farmers were trained through cooperative partners Nestle Indonesia.
- As of April 2021, more than 8,000 dairy farmers have been helped with biogas installations with a milk deposit payment scheme (average tenor of 36 months).
- The total loan disbursed was IDR 36 billion (US$2.25 million) to 8,000 small-time ranchers.
- In addition, this partnership has fostered a number of Milk Cooperatives to become BIRU Program Construction Partners in quality monitoring bio-digesters and get additional benefits for the cooperative.

2. Cooperative Energy Credit Scheme Amoghasiddhi

In 2021, this cooperative will offer a solar panel installation credit scheme for its members. However, credit utilization is only around 2.41% of the total credit offered.

30 Blue News. (June 2021).Partnership with Cooperatives and Credit Providing Institutions for Climate Change Adaptation and Mitigation. BLUE. https://www.biru.or.id/2021/06/17/6089/kemitraan-dengan-koperasi-dan-lembaga-penyedia-kredit-untuk-adaptasi-dan-mitigasi-perubahan-iklim.html

3. Kopetindo

Kopetindo is the first cooperative in Indonesia that focuses on the renewable energy business sector, including wind energy, solar energy, water energy, LED lights, and power storage. To date, this cooperative has more than 70 members.

The potential for financing renewable energy using cooperative schemes is still promising. To date, the total assets of the 100 largest cooperatives in Indonesia have reached IDR 66.6 trillion (US$4.16 billion).[31] If just 10% of these assets can be utilized for renewable energy purposes, it can fund renewable energy adoption efforts at the community level, amounting to IDR 6 trillion (US$375 million). This figure is still far from national needs, but it is large enough to support a number of small communities in areas that have not yet been electrified and whose electricity needs are still small, especially if integrated with community initiatives that utilize local tools and materials that are affordable and easy to obtain as described in the introductory part of this study.

The Ministry of Energy and Mineral Resources stated that by the end of 2022, there were 318,470 households and 199 villages that still did not have electricity. If we use the assumption that a single household in a village typically needs around 3,000 watts of electricity[32] and one power plant can generate 3,600 watts of electricity[33] with a per unit cost of around IDR 35 million or US$2,188, approximately 171,428 or more than half of the households that are still not electrified can become adopters of renewable electrical energy sources. Of course, each region requires different types of energy sources, but this calculation mathematically shows that cooperative funding has the opportunity to support the needs of people who do not yet enjoy electricity.

Until now, several groups are of the view that the supply of energy credits by cooperatives has not reached an adequate scale.[34] Just like other funding sectors, renewable energy is a new area that is not yet in the pioneering stage in Indonesia. This condition can be one of the explanations as to why cooperative financing has not been able to run on a massive scale for community-based renewable energy.

Apart from that, cooperative funding certainly requires broad support from its members. Thus, public awareness, in general, and cooperative members, in particular, regarding opportunities to fund renewable energy is needed to mobilize cooperative resources for the community-based renewable energy sector.

31 Waseso, R. (February 2021). 100 large Indonesian cooperatives recorded accumulated assets of IDR 66.6 trillion.HAPPY. https://nasional.kontan.co.id/news/100-koperasi-besar-indonesia-bukukan-akumulasi-aset-rp-666-triliun

32 Ministry of Villages, Development of Disadvantaged Regions and Transmigration. (2016).Technical Book for Village Electrification Facilities and Infrastructure. Ministry of Villages, Development of Disadvantaged Regions and Transmigration. https://celios.co.id/2024/indeks-kesiapan-transisi-energi-indonesia/

33 Pradana, A. R., & Kurniati, P. (2024, January). The story of Noer Chanif, a vocational school teacher in Blora who created a wind and solar power plant for street lighting.Kompas.Com. https://regional.kompas.com/read/2021/08/28/092243778/kisah-noer-chanif-guru-smk-di-blora-yang-ciptakan-pembangkit-listrik-tenaga?page=all#google_vignette

34 Triyatna, S. O. (June 2021). The Role of Cooperatives on Climate Change is Uncharted.Kompas.Id. https://www.kompas.id/baca/ekonomi/2021/06/23/peran-koperasi-untuk-perubahan-iklim-belum-terpetakan.

C. Direct Investment (via investors and venture capital)

Live support with direct investment. So far, more has been done through venture capital and investors to develop renewable energy-themed startups such as Xurya or Sun Energy. It is known that the total funding that has been channeled through direct investment schemes to the two startup companies has reached IDR 861 billion or equal to US$ 53.7 million[35,36], and there are still several other renewable energy startups that are in the incubation stage, such as Sylendra Power, Forbetric, Warung Energi, Pendulum, and Bionersia.[37]

So far, there doesn't appear to be any specific investment for community use. Support was recently provided by Schneider Electric via an impact investing scheme. SolarKita also seems to be more aimed at penetrating the solar panel market in the household segment as a single unit rather than using renewable energy at the community level.[38]

From the current development of direct funding, which is still not very substantial yet, it can be said that investors have not yet been involved in developing renewable energy in Indonesia for a long time, and there is still a tendency to wait and see, possibly because government policies regarding renewable energy are still in the pilot stage so financing for new players in this sector is still considered high risk for investors.

So, to date, direct investment schemes at the community level do not seem to have received enthusiasm or special attention from investors. However, contributions of funds from direct investment can still be collected in the form of impact investing, which is generally facilitated by international institutions such as the Asian Development Bank (ADB).

Globally, the estimated total funding in the impact investing sector has reached US$1,164 trillion dollars.[39] Even under rather pessimistic assumptions, such as just 1% of the total value of these funds could distribute US$10.6 billion. This figure already exceeds the need for installation of renewable energy sources for 318.470 households that are still not electrified, with the assumption that the equipment value per unit is US$2,188.

The first step to push impact investing towards community-based energy can be done by creating and opening access to financial products that accommodate the placement and use of funds for projects at the community level (see section **"Capital Market"** below).

Apart from that, Indonesia has no policy that specifically provides incentives for impact investing schemes. Regulatory support and tax incentives can be used to attract the interest of foreign and domestic investors engaged in impact investing.

35 CNBC Indonesia. (November 2022). Sun Energy Receives Series A Funding of IDR 360 Billion, One of which is from Toba Bara Energy. TBS Energy. https://www.tbsenergi.com/berita/baca-berita/2182/sun-energy-raih-pendanaan-seri-a-rp-360-m-salah-satunya-dari-toba-bara-energy

36 Xurya. (January 2023).Until the end of 2022, Xurya has succeeded in expanding its business and increasing rooftop solar installations for Industry 4.5. Khurya News. https://xurya.com/News/hingga-akhir-tahun-2022-xurya-berhasil-melakukan-ekspansi-bisnis-dan-meningkatkan-instalasi-plts-atap-untuk-industri-45

37 Hutauruk, D. M. (March 2020). These are the 6 EBT startups that are included in the New Energy Nexus incubation and acceleration program.HAPPY. https://industri.kontan.co.id/news/ini-6-startup-ebt-yang-masuk-program-inkubasi-dan-akserasi-new-energy-nexus#google_vignette

38 Afriyadi, A. D. (January 2024). Having EBT Potential, RI is Attracted by Foreign Companies.Detik Finance. https://finance.detik.com/energi/d-7149751/punya-potensi-ebt-ri-dilirik-perusahaan-asing

39 Impact Investing Institute. (2022). The Impact Investing Market. Impact Investing Institute. https://www.impactinvest.org.uk/learning-hub/the-impact-investing-market/#:~:text=The%20GIIN%27s%202022%20market%20sizing,is%20covered%20in%20Appendix%201

Both of these aim to open up opportunities for collaboration with a wider variety of organizations, such as venture capital and individual investors (not just development banks (MDBs).

Apart from that, there needs to be an institution that acts as an intermediary between the community and investors. Each community has different capabilities. So, in raising funds, these communities need guidance in formulating technical project plans and using investor funds. This is important to maintain investor confidence and help the community to create standardized fund management plans.

D. Capital Market

There have already been several capital market products with renewable energy financing as the theme, although the distribution of these funds also tends to be aimed at users of funds in large entity groups such as corporations or public companies.

For example, there are many green bonds issued by both banking and non-banking institutions. However, the target market of these bonds is generally large companies or entities that are capable of issuing them. This also applies to funding in the stock market. Several companies, such as PT Arkora Hydro Tbk. (ARKO) and PT Kencana Energi Lestari Tbk. (KEEN), and PT Barito Renewables Energy Tbk. (BREN) For example, it has issued shares that are currently also traded on the secondary market.

Mutual Funds are also one of the capital market products that can serve as an alternative to finance renewable energy. For example, mutual funds for renewable energy Insight Renewable Energy Fund, whose funds are allocated to a number of energy companies. Part of the funds collected for this product were also distributed to the Lestari Energy Foundation, a non-profit organization engaged in empowering communities for energy independence.

Based on our estimates and those of a number of institutions[40] The total funding raised through bonds, shares, and mutual funds in the capital market for the green sector has reached at least US$4.37 billion, originating from IPOs, issuance of bonds and sukuk (Islamic bond), as well as mutual funds. The implication is that funding opportunities from the capital market are actually quite large.

40 Dataword. (2022, March).Indonesia Has Collected IDR 62 Trillion in Funds from Green Debt Securities. Databox Databox. https://databoks.katadata.co.id/datapublish/2022/03/21/indonesia-sudah-himpun-dana-rp62-triliun-dari-surat-utang-hijau.

Table. List of ESG IPOs, Bonds and Sukuk

Type

CONDITION

Examples of Related Entities/Names

PT Arkora Hydro Tbk. (ARKO) and PT Kencana Energi Lestari Tbk. (KEEN), andPT Barito Renewables Energy Tbk. (BREN)

Estimated Total Financing Value orAssets Under Management (AUM) (US$)

More than 281.25 million

Type

Bonds and Sukuk

Examples of Related Entities/Names

Sustainable Bonds III Maybank Finance, Green Sukuk Wakala Republic of Indonesia, Sustainable Social Insight Bonds, Sustainable Sukuk Ijarah, Green Sukuk Savings

Estimated Total Financing Value orAssets Under Management (AUM) (US$)

More than 3.94 billion

Type

Mutual funds

Examples of Related Entities/Names

SRI KEHATI, IDX ESG Leaders (ESGL)

Estimated Total Financing Value orAssets Under Management (AUM) (US$)

More than 212.5 million

Innovative financial products need to be developed to open community access to capital markets. If so far, capital market products have only been launched by large companies and the government; the community level can also be given the opportunity to publish products that can be funded by the public.

There are several examples of community-based capital market products that have been facilitated by a number of organizations. For example, Tapestry Community Capital Canada offers community-based bond offering and administration consulting services (community bonds).[41] These Community Bonds are used to fund projects such as solar panel installations and the adoption of other renewable energy.

Tapestry Community Capital acts as a consultant to donor organizations, nonprofits, and cooperatives ("clients") who wish to issue these bonds. In the process, clients will be assisted by consultants from the organization to prepare documents and campaigns to offer bonds to potential investors. However, Tapestry Community Capital does not act as an intermediary. Clients will interact directly with potential investors who express interest in funding the proposed project.

The implementation of a community-based bond scheme in Indonesia can be done, for example, by allowing village units to propose projects and issue their own bonds with feasibility studies, bond structure planning (interest value, tenor, etc.), and administration processes assisted by national banks, banks regional, or central government. For the initial stage, these bonds can be offered to institutional investors engaged in the field of impact investing.

If, in the future community-based bonds are built, it is possible that these bond-based fixed income mutual fund products can be offered to the wider community. The government can provide tax incentives specifically for community-based bond transactions, thereby increasing investor interest in these products.

Other products that can be developed in Indonesia include Cash Waqf, which is included in sharia financing. Social Islamic Bank Limited from Bangladesh has been offering cash waqf since 2004. Fund providers in cash waqf can choose thematic areas in their investments.[42] Sharia banks can develop this product further and become facilitators for communities in raising funds for the purpose of adopting renewable energy.

Apart from that, local governments can actually issue bonds to support certain activities in their respective regions. However, there are a number of obstacles that prevent many regional bonds from being issued.[43] Carrying out feasibility studies in selecting projects to be financed is one of the challenges in issuing regional bonds.[44]

Nevertheless, regional bonds can be a financing option, especially if the region can promote electricity distribution projects in areas that are still not electrified through a low-cost renewable energy power generation unit production scheme and obtain the support of the local community.

41 Tapestry Capital. (n.d.). Community Bonds. Retrieved February 7, 2024, from https://tapestrycapital.ca/community-bonds/

42 Ministry of Finance of the Republic of Indonesia. (n.d.).The Role of Cash Endowments in Impact Investing. Retrieved February 7, 2024, from https://fiskal.kemenkeu.go.id/files/siaran-pers/file/SP%20-BKF%20-%20Peran%20Waqaf%20Tunai%20dalam%20Impact%20%20Investing.pdf

43 Sofi, I. (2022, March 12). Dream of Issuing Regional Bonds. Ministry of Finance Opinion. https://fiskal.kemenkeu.go.id/files/siaran-pers/file/SP%20-BKF%20-%20Peran%20Waqaf%20Tunai%20dalam%20Impact%20%20Investing.pdf

44 Indriarsih, N. (2023).Municipal Bonds: Opportunities and Challenges. PEFINDO. https://old.pefindo.com/fileman/file/1409#:~:text=Municipal%20bonds%20and%2For%20sukuk,term%20on%20its%20maturity%20dates

E. Village Fund

Opportunities for funding community-based renewable energy through fiscal policy have the potential to come from village fund budgets. Increasing village funds in the 2024 state budget (APBN) to US$ 4.44 billion will be a strategic opportunity for communities, especially village communities, to develop small-scale renewable energy.

This will also be in line with the government's target, namely the Ministry of Energy and Mineral Resources, regarding the electrification ratio, which is being pursued at 100% in 2024. The electrification ratio, which in 2024 will reach 99.78%, is expected to become 100% by reaching 140 villages that do not yet have access to electricity in South West Papua, Papua, Papua Mountains, Central Papua, and South Papua.[45]

The Director General of Electricity at the Ministry of Energy and Mineral Resources, Jisman Hutajulu, said that the government, through PLN, needs to fund IDR 22.08 trillion, or equal to US$ 1.38 billion, to achieve 100% electrification.[46] Therefore, renewable energy funding through village fund budget allocations can be another source of funding which not only supports clean energy, but also supports government programs in achieving the target.

In fact, if the government is committed to implementing regulations that earmarked 3% of Village Funds to be allocated for renewable energy out of a total of US$ 4.44 billion, the funds available for renewable energy are US$ 1.3 billion, which almost reaches the PLN funding requirements above. This could be a funding opportunity apart from State Capital Participation (PMN) to PLN, which was canceled in 2024.

Marianti Research, Renewable Energy al. (2023) regarding village funds reveals that the budget contribution for renewable energy development is still insignificant, both in terms of the number of villages allocated and in terms of the ratio of the renewable energy budget to total village funds.

Table 1: Renewable energy development ratio in the Village Fund Budget[47]

Year	Number of Village	Village Fund Realization (Billion US$)	Renewable Energy Realization (Billion US$)	Ratio of Village	Ratio of Village Fund Realization (%)
2018	74.875	3.69	0.01	1.90	0.27
2019	74.774	4.24	0.04	8.36	0.92
2020	74.886	4.52	0.03	8.04	0.69

Sumber: (Marianti, et al. 2023)

Source: (Marianti, et al., 2023)

45 Afriyadi, A. D. (15 January 2024). Duh! 140 Villages Are Still In Pitch Dark Without Enjoying Electricity.Detik Finance. https://finance.detik.com/energi/d-7142800/duh-140-desa-masih-gelap-gulita-belum-nikmati-listrik

46 coilBUSINESS. (January 18, 2024). PLN Needs IDR 22 T to Increase Electrification Ratio to 100 Percent.Coil. https://kumparan.com/kumparanbisnis/pln-butuh-rp-22-t-buat-naikkan-rasio-elektrifikasi-jadi-100-persen-21zUWooK99u

47 Marianti, et al. (2023). Village Fund for Renewable Energy Development: A Case Study of Rural Area in Indonesial. International Journal of Energy Economics and Policy.

Apart from the effect of the COVID-19 pandemic in 2020, the ratio has indeed increased. However, this ratio is still considered too small to show the commitment of the village government budget in efforts to develop renewable energy. The ratio of the number of villages that allocate renewable energy funds needs to be increased significantly and gradually to reach all villages in Indonesia; hence, earmarking is very important. The realization ratio of renewable energy village funds is also still very small, not even reaching 1%, so it is very far from the ideal of 30%.

The village fund allocation policy for renewable energy has several challenges, both related to human resource capacity, financial accountability and transparency, and program bureaucracy. This needs to be anticipated by the relevant government in order to optimize the use of the special budget. The government needs to prepare the village's human resources, both officials and the community, with intensive training up to the technical level regarding the use of renewable energy funds.

Training and assistance in managing these funds so that they are accountable and transparent are also needed so that implementation is effective, efficient, and appropriate. Apart from that, it is hoped that it will be able to prevent potential corruption from renewable energy funds because the concept is that society as a community can supervise it directly. Likewise, with program bureaucratic red tape that village officials often face, for example, in terms of accountability documents, the government needs to create a mechanism that is as practical as possible and user-friendly for administrators and village communities to provide convenience.

Photo: Celios

46 Marianti, et al. (2023). Village Fund for Renewable Energy Development: A Case Study of Rural Area in Indonesial. International Journal of Energy Economics and Policy.

Experience in Tepian Terap Village Fund Management

Tepian Terap Village, Sangkulirang District, East Kutai Regency, East Kalimantan, has been able to meet its electrical energy needs independently since 2015. They chose the Micro Hydro Power Plant (PLTMH) as the main source of electricity generation in their village.

The main source of water comes from Jiwata Springs, which has a large flow and never dries up even though the dry season lasts for months.

This spring is located in the Cultivation Rights location of an oil palm plantation, which is vulnerable to conversion. The village government is negotiating to keep the211-hectaree forest area intact.

Funding comes from the Village Fund, CSR of palm oil companies around the village, and community non-governmental funds.[48] Finally, in 2015, energy independence was realized. In fact, it continues to operate well today. The management is handed over to BUMDes Jiwata Energi, which is owned by the Tepian Terap Village Government.

Photo: 350.org Indonesia

48 The wonderful Jiwata Spring, which is able to illuminate the countryside through Micro Hydro,https://www.mongabay.co.id/2023/08/18/hebatnya-mata-air-jiwata-yang-mampu-terangi-desa-tepian-terap-lewat-mikro-hidro/, accessed March 7 2024, at 16.19 WIB

F. Reallocation of Fiscal Incentives

The reallocation of fiscal incentives presents A significant opportunity. Specifically, the incentives currently directed towards the coal mining sector could be redirected towards the renewable energy sector. The government's plan to provide substantial fiscal incentives to the coal downstream and gasification industry, including 0% royalty payments, is based on Perppu Number 2 of 2022 concerning Job Creation. However, this regulation is controversial and has the potential to be economically, socially, and environmentally detrimental. By redirecting these incentives towards renewable energy, we can foster a more sustainable and economically viable future.

CELIOS Study (2023)[49] found that this coal royalty incentive policy will be detrimental to the state in terms of the APBN and APBD, namely increasing the 2023 APBN budget deficit by up to 5.7% and reducing regional government income from the Natural Resources Revenue Sharing Fund significantly.

Estimation of State Losses from Coal Sector Revenues

666.6*
Total coal production (million tones)

10.84*
Non tax state revenue minerals and coal (billion US$)

9.19**
Coal royalties (billion US$)

2.11***
State loss from royalties 0% (billion US$)

Source: The Ministry of Energy and Mineral Resources of the Republic of Indonesia, processed
* Non tax state revenue per December 27, 2022. Ministry of Finance
** Coal royalties account for 85% of total mining non-tax state revenues
*** DME based on Tanjung Enim project in South Sumatera at 23% of total coal production

State losses could reach US$ 2.11 billion per year, and if it is valid for 20 years, it will result in losses of up to US$ 42.2 billion. Apart from that, regional government DBH SDA such as East Kalimantan and South Sumatra will be drastically reduced as a result of this policy, considering that in 2021, these two provinces will receive DBH SDA US$ 0.08 billion for provinces and districts/cities in South Sumatra, while East Kalimantan is US$ 0.42 billion. This is in stark contrast to the principles of fair compensation and redistribution of natural resources to the regions.

Research Institute for Energy Economics and Financial Analysis (IEEFA) study in 2020,

49 CELIOS. (2023). Losses from Coal Downstreaming in the Job Creation Perpu.CELIOS. https://celios.co.id/2023/kerugian-dari-hilirisasi-batubara-dalam-perpu-cipta-kerja/.

"Proposed DME project in Indonesia (D) does not (M)ake (E) economic sense"[50] revealed that the coal gasification project in Indonesia will result in losses of up to US$377 million from operational costs and financial costs. In fact, this loss is far compared to the LPG savings of US$19 million. At the time the study was issued, the price of LPG was US$ 365/ton, while the production cost of DME was US$ 470/ton, so it was more expensive and would burden Indonesian taxpayers with less energy.

So, it is important for the government to implement a zero percent coal royalty reallocation policy that has the potential to fund renewable energy, including community-based ones.

Apart from the reallocation of 0% coal royalties, there are several lists of fiscal incentives for oil, gas, and mining, including those from the natural resources downstream program[51] that can be reallocated for community-based RE funding, namely:

- Exemption from import duties on equipment imports, exemption from import taxes (PDRI) for machinery and other strategic goods, zero percent luxury tax (PPnBM tariff), ban on exports of raw materials, and export duties on raw materials to support the availability/adequacy of raw materials and equipment (downstreaming of natural resources)
- Tax holidays and tax allowances, tax facilitation, zero percent royalties to increase the added value of coal, different royalty rates for mineral commodities, export facilitation by the Indonesian Export Financing Institute (LPEI), and Free Trade Agreement (FTA) trade agreements in order to encourage investment and expansion market access (Downstream Natural Resources)

G. Renewable Energy Endowment Fund

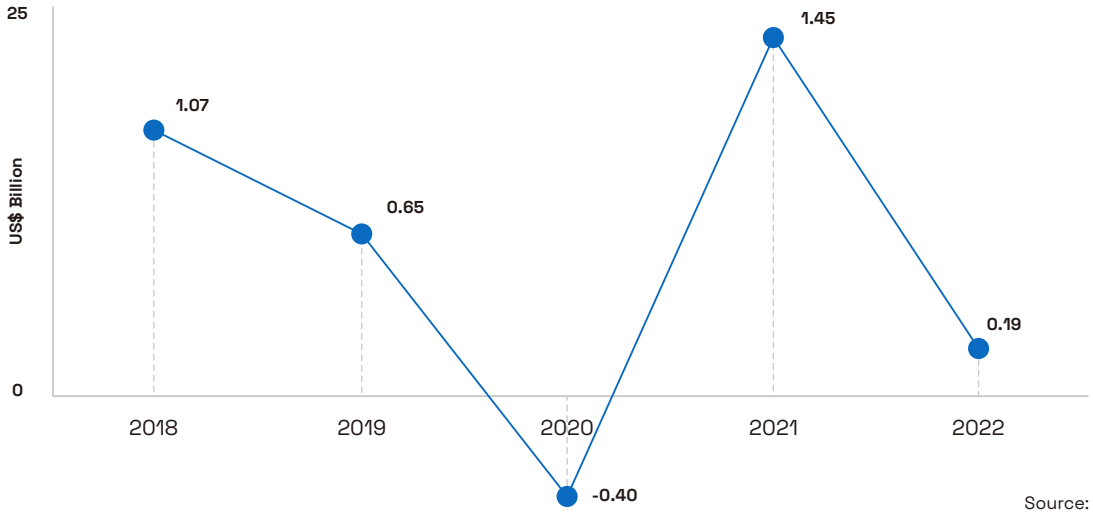
Renewable energy funding policies in the context of fiscal policy can be pursued by establishing a renewable energy Endowment Fund (ET). The renewable energy Endowment Fund, in particular, can be allocated from the surplus or remaining Natural Resources Profit Sharing Fund (DBH), which will be discussed in another chapter, during 2019-2023 there is US$ 3,88 billion.

Renewable energy Endowment Funds can also be combined potentially with Regional Endowment Fund policies through the Invitation on Government and Regional Financial Relations (HKPD). Regional Endowment Funds are allocated from the remaining Budget Calculations (SiLPA) owned by regional governments, both provincial and district/city.

50 JEFA. (2020).Proposed DME project in Indonesia (D)oes not (M)ake (E)conomic sense. JEFA.https://ieefa.org/wp-content/uploads/2020/11/Proposed-DME-Project-in-Indonesia-Does-Not-Make-Economic-Sense_November-2020.pdf

51 Ministry of Finance. (2024).Book II Financial Notes along with the State Revenue and Expenditure Budget Plan. https://media.kemenkeu.go.id/getmedia/46a5372a-ddbc-4b8e-be87-6ea95d2f72a5/BUKU-II-Nota-Keuangan-RAPBN-TA-2024.pdf?ext=.pdf

Unspent Funds at End of Fiscal Year 2018-2022



Source:
Posture of the Ministry of Finance's DJPK APBD

The SiLPA data for the five years above reveals that there is a possibility for funds that can be utilized by the government to become Regional Endowment Funds. Budget realization during 2018-2020 almost always resulted in SiLPA, except in 2020, when there was a budget deficit. These findings generated a total of US$ 3.35 billion over those five years. These funds will be very significant if they can be used to form Regional Endowment Funds with good management that will produce optimal returns.

The formation of Regional Endowment Funds needs to take into account the minimum criteria for a suitable regional government, namely having high fiscal capacity and providing good basic public services. It is recommended that the indicator for adequate basic public service be set by achieving output/outcome indicators from basic public services in the education, health, and infrastructure sectors that are equal to or exceed the national average. According to data in Fiscal Decentralization Communication and Information Media regarding the Potential for Establishing Regional Endowment Funds, there are 63 regions that are eligible to form Regional Endowment Funds with details of 60 districts/cities and three provinces; this number is equivalent to 11.6% of regions.[52]

In addition, special arrangements are needed in the HKPD Law and revision of related regulations to ensure that Regional Endowment Funds are designated for long-term programs, for high-priority sectors, are managed transparently, have a legal fund management body, and have established fund availability. One of the high-priority and long-term sectors for regional interests is the development of community-based renewable energy, which is expected to prepare regional areas for the climate crisis and transition to cleaner, more equitable energy.

52 Fiscal Decentralization Communication and Information Media in 2022. (2022).Potential for Establishing Regional Endowment Funds Through the HKPD Law.https://djpk.kemenkeu.go.id/wp-content/uploads/2022/04/Majalah-Defis-Edisi-XXXI-2022.pdf

H. Windfall Profit Tax

Windfall Profit Tax, or what is known as windfall tax, is a tax on excess profits obtained by companies under favorable conditions, for example, when there is a boom in the commodity price. This tax has the potential to be a source of funding for renewable energy, especially for windfall profits on extractive sector commodities, namely oil, gas, and coal.

The government can apply this tax to companies whose profits have consistently increased for two years due to surges in commodity prices on international markets. This is because the profits obtained by the company are not based on performance, but rather due to dynamic conditions in the market, for example war. The uncertain world situation, several times experiencing political fragmentation and geopolitical tensions have the potential to cause the prices of certain commodities, such as oil, gas, coal or certain critical minerals to rise drastically.

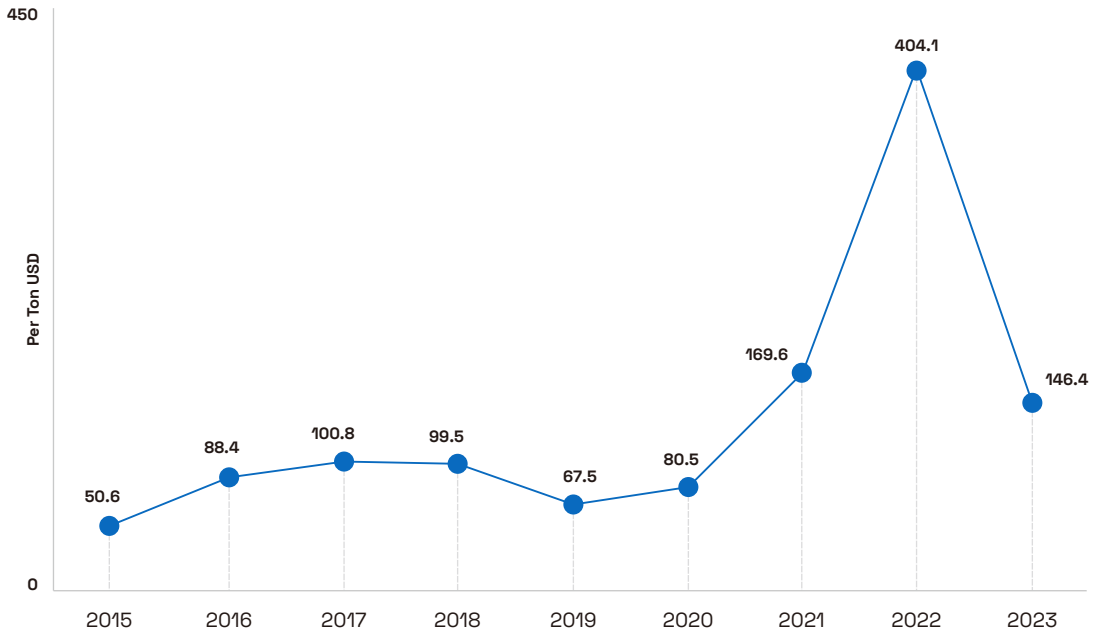
Net Profit Margin Seven Coal Mining Companies 2018-2023

Companies	2018	2019	2020	2021	2022	2023
PT Bumi Resources	14.23%	0.85%	-42.68%	22.16%	30.42%	1.60%
PT Adaro Energy	13.19%	12.58%	6.25%	25.76%	34.94%	28.46%
PT Bayan Resources	31.27%	16.83%	24.69%	44.38%	48.93%	35.73%
PT Indika Energy	3.30%	0.18%	-5.70%	2.06%	13.01%	4.86%
PT Dian Swastatika	6.79%	4.30%	-3.84%	12.26%	21.80%	17.26%
PT Bukit Asam	24.19%	18.54%	13.90%	27.47%	29.96%	16.35%
PT Indo Tambangraya	12.89%	7.37%	3.19%	22.89%	32.98%	21.04%
Average	**15.12%**	**8.66%**	**-0.60%**	**22.43%**	**30.29%**	**17.90%**

Source: (Arifbillah, Santoso, Yolanda, & Wijaya, 2023)

The data in the table above shows that the Net Profit Margin (NPM) of Coal companies in Indonesia experienced a surge in profits for two consecutive years, which could be called windfall profit tax in the coal sector. This could be the underlying finding for implementing the windfall tax policy because the surge in profits occurred due to the increase in coal commodity prices due to the Russo-Ukraine conflict and the acceleration of China's economic recovery.

International Coal Prices 2015-2023



Source: Trading Economics[53]

Data on international coal prices in 2022 shows that there will be an increase of up to 283% from the beginning of the year to the peak price in September 2022. This phenomenon, in the midst of global geopolitical and economic uncertainty, could potentially happen again, making the urgency of windfall profit tax stronger.

Changes to the Law on Harmonization of Tax Regulations need to be made to add this type of tax. Additionally, it is required for clear earmarking in this tax levy so that the redistribution of income is right on target, namely in this case it is used to fund community-based renewable energy. Research by Arifbillah, Santoso, Yolanda, & Wijaya in 2023 estimates the potential windfall profit tax at IDR 382 trillion or equal to US$ 23.8 billion with a basic tax rate of 28%.

I. Coal Production Tax

The intended coal production tax is different from the policy in Non-Tax State Revenue (PNBP) regarding production fees or coal mining royalties, which in the final regulation PP Number 26 of 2022 regulates the calorific level in the tariff and the addition of criteria for coal price progressive reference. However, this coal production tax is applied to the maximum coal production quota limit. Any excess of the coal production quota produced must be taxed. This policy is relevant amidst the increase in coal production in recent years.

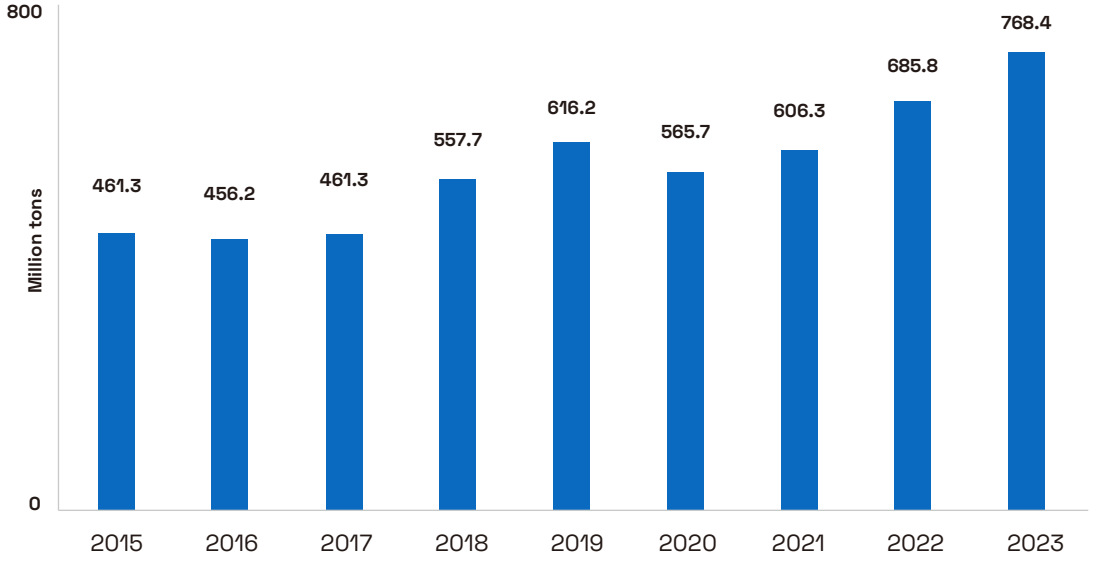
Increasing the realization of coal production in Indonesia could be an inhibiting factor in the energy transition and disrupt economic

53 Trading Economics. (2024). Summary Coal Price [dataset]. https://tradingeconomics.com/commodity/coal

stability in Indonesia. Last year, coal production reached 110.43% of the target of 694 million tons. Meanwhile, in 2024, a larger target is set at 710 million tons, and this is accompanied by a commitment from the Ministry of Energy and Mineral Resources to increase production in order to support national energy security, economic growth, and state revenues. This government commitment could hinder the energy transition because achieving coal production that exceeds the target is considered an achievement. This is further exacerbated by the discourse of revising the RE mix target by the Ministry of Energy and Mineral Resources to be lower than before.[54]

This situation is risky for economic stability, considering that so far, the negative externalities of the coal sector, from environmental, social, and health losses, have never been taken into account. Not only that, the claim that this sector absorbs a large workforce which benefits the economy is also doubtful, considering that Indonesia Statistics (BPS) data for the mining sector's contribution to employment in Indonesia is only 1.19% in 2023.

Coal Production Realization 2015-2023



Source: MOSI ESDM 2024

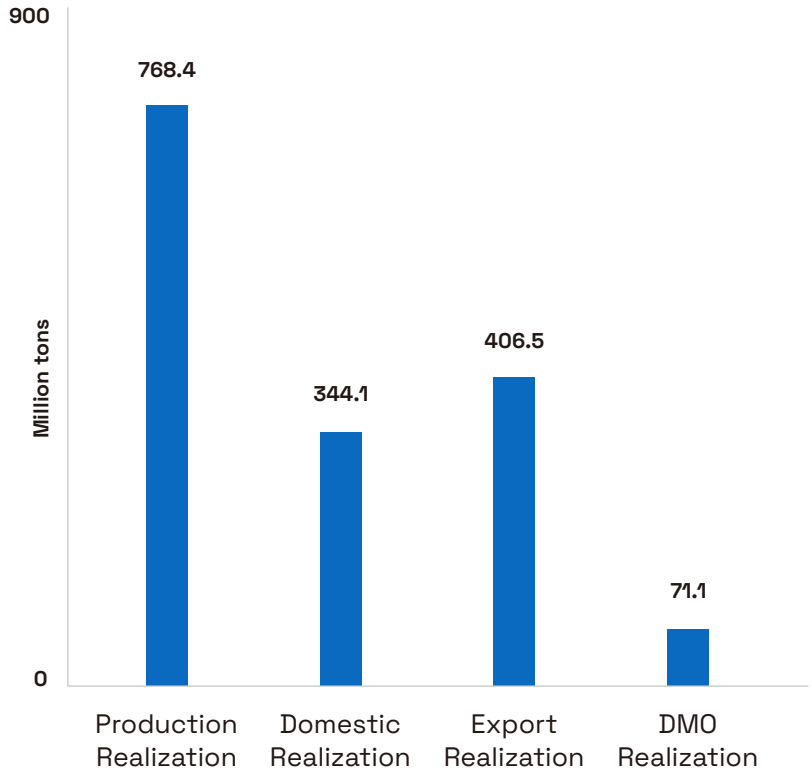
Let's take the example of a company that has a coal production quota of 15 million tons, so that any coal production exceeding 15 million tons must be subject to a minimum tax of 30% of the reference coal price per ton. As an illustration, using the coal price per ton of US$125.85/ton as of January 2024, when producing excess production of 1 million tons, the company must pay US$37.75 million to the government.

This policy will not only be effective in providing disincentives to the extractive sector, but it will also damage the environment and society and give rise to large negative externalities in the

54 Muliawati, Firda Dwi. (January 18, 2024). RI's 2025 EBT Mix Target Drops to 17%, This is the Reason for ESDM.CNBC Indonesia. https://www.cnbcindonesia.com/news/20240118173844-4-507048/target-bauran-ebt-ri-2025-turun-jadi-17-ini-alasan-esdm

economy, especially in health costs and disaster management costs. However, it is hoped that it will be able to improve the management of production quota planning, which prioritizes ecological aspects. This is important because there had been an oversupply in coal production in 2019, which, apart from causing coal prices to plummet, is clearly not in line with efforts to reduce carbon emissions, which in Sustainability Report PLN in 2020 coal-fired power plants contributed 83% of total emissions (124.4 mtCO2e).[55]

Coal Production Realization 2023



Source: MOSI ESDM 2024

The proceeds from this tax can be used to fund community-based renewable energy, especially for communities near mining areas or those similarly affected by mining activities. The potential tax revenue from coal is based on the data recorded in Minerba One Data Indonesia on the subject of Indonesian coal production that reached 768.41 million tons[56] while the production quota is 694 million tons, so the government can get funds of US$ 2.73 billion or IDR 43.68 trillion (exchange rate US$ 16,000) assuming the tax rate is 30% of the coal price (US$ 125.85/ton as of January 2024).

55 IISD. (2021). Global Subsidies Initiative Issues Brief "Taxing Coal to Hit the Goals: A Simple Way for Indonesia to Reduce Carbon Emissions". IISD. https://www.iisd.org/system/files/2021-08/taxing-coal-indonesia-reduce-carbon-emissions.pdf

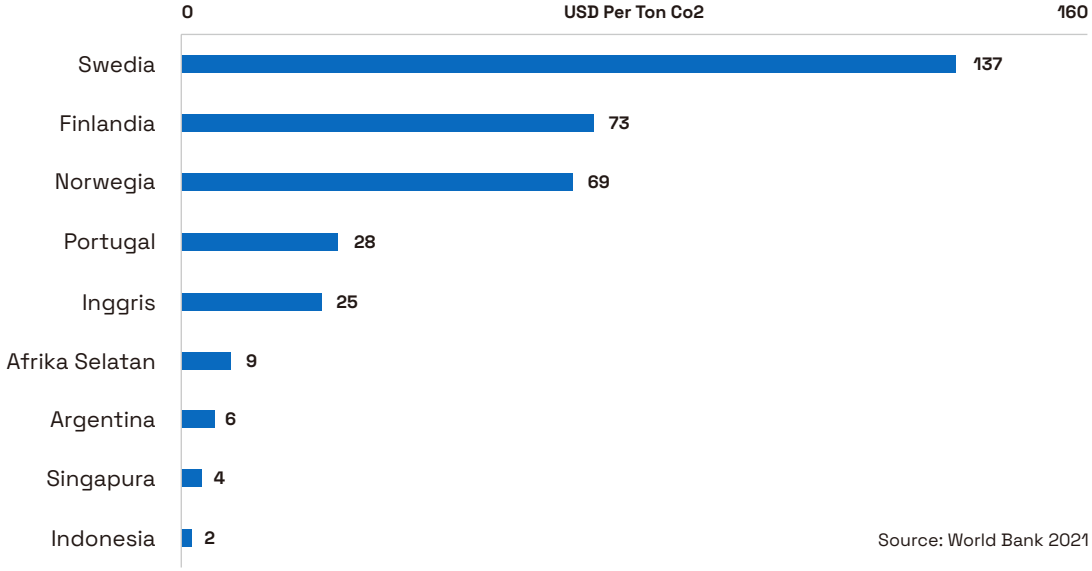
56 MODI ESDM. (2024). Realization of Coal Production and Sales [dataset]. https://modi.esdm.go.id/produksi-batubara

J. Carbon Tax

The government has issued regulations related to carbon tax through Law Number 7 of 2021 concerning Tax Harmonization (UU HPP), but its implementation, which was planned for 2022 has been postponed until 2025. This is a step back from the government regarding policies that could disincentive extractive sector and can be a source of funding for renewable energy, including for earmarked communities. Ideally, the carbon tax contribution to community-based renewable energy funding is 20-30% for optimal implementation.

Another problem emerged apart from the delay in implementation, namely the revision of the carbon tax rate set by the government to only IDR 30 (US$ 0.002) per kilogram of equivalent carbon dioxide. This makes Indonesia the country with the lowest carbon tax rate among the G20 countries.

Other Countries Carbon Tax Rates



Source: World Bank 2021

The government needs to immediately clarify the carbon tax collection mechanism and conduct transparent earmarking to ensure the optimization of carbon tax revenues. Carbon policy does have the main challenge of long preparation and effective implementation process; in South Africa for example, it took almost a decade to ensure the effectiveness of its implementation. The long preparation of this policy is usually related to details such as tax coverage in the sectors, exemptions or compensation in sensitive sectors, periods for tax phasing, and the ratification of regulations in the parliament.

The 2021 IISD report states that the Ministry of Finance estimates the potential for a carbon tax in Indonesia, assuming the taxation rate of IDR 75,000 (US$ 4.68) per tonne of CO2 as according to the draft planning for the HPP Law, has the potential to generate funds of IDR32 trillion (US$ 2 billion) per year when applied in the energy sector.[57] Therefore, the carbon tax rate needs to be increased following the initial

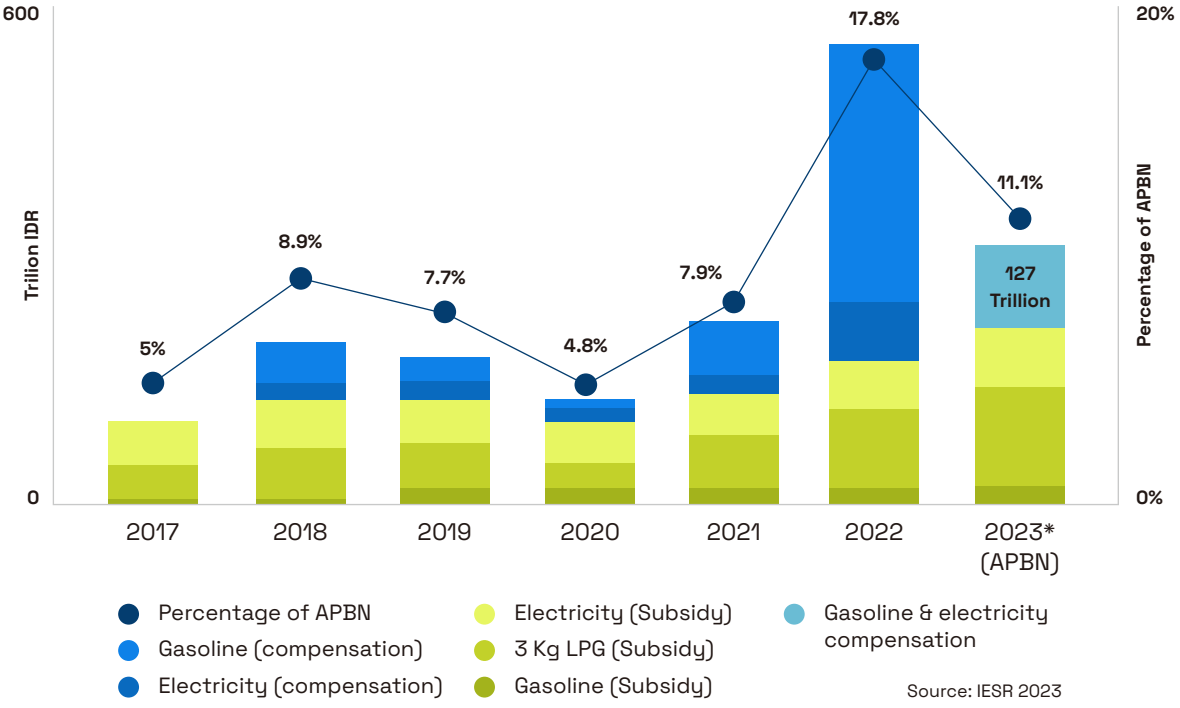
57 IISD. (2021).Global Subsidies Initiative Issues Brief "Taxing Coal to Hit the Goals: A Simple Way for Indonesia to Reduce Carbon Emissions".

planning draft or at least around IDR 60-100 (US$ 0.004-0.006) per kilogram of carbon dioxide equivalent.

K. Reallocation of Fossil Energy Subsidies

Fossil energy subsidies in the APBN are subsidies and compensation for fuel and electricity items. Indonesia, in the IMF Fossil Fuel Subsidies Data report: 2023 Update is included in the 10 countries with the largest subsidies in the world, namely in 7th place. Indonesia's total subsidies throughout the year reached US$194.12 billion, with explicit subsidies amounting to US$ 78.18 billion and implicit subsidies worth US$115.95 billion.[58] In this report, the IMF recommends that countries evaluate their energy subsidy policies to reduce air pollution and anticipate the climate crisis. This is in line with COP 26's mandate to remove inefficient fossil subsidies.

Fossil Fuel Subsidy and Compensation with Their Percentage of APBN



Source: IESR 2023

Report Indonesian Energy Transition Outlook 2024 reveals similar things regarding the still large fossil energy subsidies in Indonesia, including the largest in 2022 which reaches 17.8% of the APBN.[59] This increase in fossil energy subsidies began when in that year the govern-ment compensated for Pertalite fuel in the Special Assignment Fuel Type (JBKP) scheme, thereby increasing consumption from 10 to 27 million KL.

58 IMF. (2023). IMF Fossil Fuel Subsidies Data: 2023 Updates [dataset]. https://www.imf.org/en/Publications/WP/Issues/2023/08/22/IMF-Fossil-Fuel-Subsidies-Data-2023-Update-537281

59 IESR (2023). Indonesian Energy Transition Outlook 2024. IESR. https://iesr.or.id/pustaka/indonesia-energy-transition-outlook-ieto-2024

This causes fuel compensation to be IDR 54.7 trillion (US$ 3.42 billion) above the threshold. Interestingly, reports IESR[60] The study revealed that the negative externality costs of fossil energy subsidies in the health and environmental sectors are the same as the Ministry of Energy and Mineral Resources' estimate to achieve the renewable energy target of 23% by 2025, which requires a budget of IDR 120 trillion (US$ 7.5 billion).

L. Wealth Tax

The wealth tax instrument becomes relevant when looking at carbon inequality data. DataWorld Inequality Report 2022 shows that the richest groups contribute a greater carbon footprint than the poorest groups. Inequality in Indonesia does not only occur in income and wealth inequality. Inequality also occurs in the carbon footprint, where the richest 10% and 1% produce more carbon than the entire population.

	Avg. GHG footprint (tCO2e/capita)
Full population	**3.3**
Top 1%	**42.2**
Top 10%	**11.8**
Middle 40%	**3.5**
Bottom 50%	**1.4**

Interpretation
The table presents the average CO2 emissions of different groups of the population in 2019. Emissions take into account carbon embedded in consumption and investment portfolios

Sources and series:
wir2022.wid.world/methodology

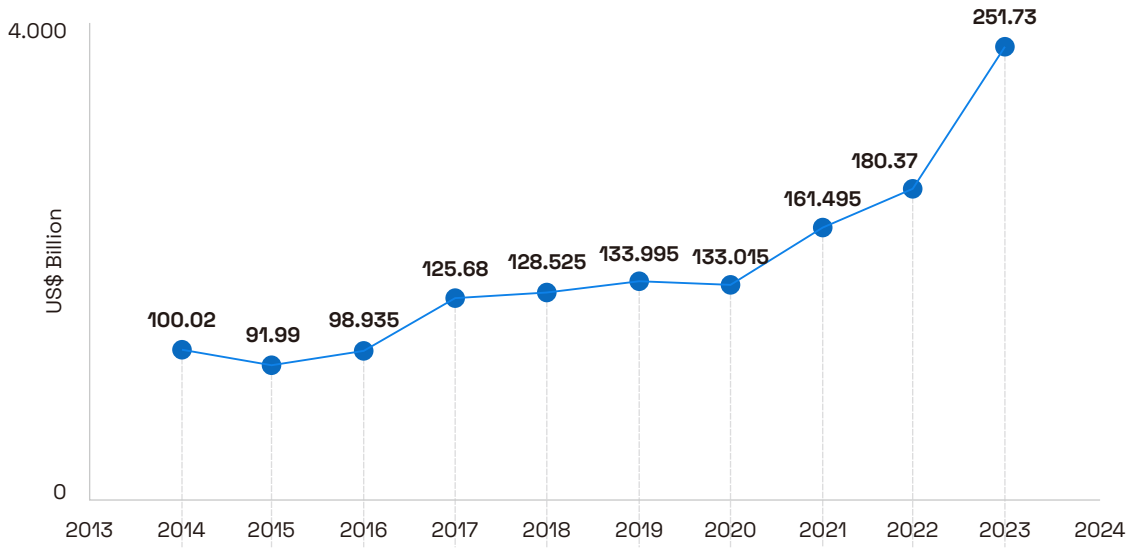
Source: World Inequality Report 2022

Data World Inequality Report 2022 reveals the Indonesian population has a carbon footprint of 3.3 tCO2e/capita, while the poorest 50% produce 1.4 tCO2e/capita. The richest 10% group produces a larger carbon footprint of 11.8 tCO2e/capita; even the richest 1% group produces a larger carbon footprint of 42.2 tCO2e/capita so that carbon footprint inequality occurs.[61]

Meanwhile, speaking about national wealth inequality, quoted from Forbes, the net worth of the 50 richest people in Indonesia has increased significantly in the last 10 years. In 2014, 10 years ago the total was IDR 1,576 trillion (US$ 98.5 billion) and will increase 2.5 times in 2023 to IDR 3,966 trillion (US$ 247.88 billion).[62]

60 Ibid
61 World Inequality Lab. (2022). World Inequality Report 2022. World Inequality Lab. https://wir2022.wid.world/www-site/uploads/2023/03/D_FINAL_WIL_RIM_RAPPORT_2303.pdf
62 Forbes. (December 6, 2023). Indonesia's 50 Richest.Forbes. https://www.forbes.com/lists/indonesia-billionaires/?sh=370d79a2ff78

Graph of the total wealth of the Forbes 50 in Indonesia for the last ten years.



Source: FORBES 2024 processed by CELIOS

The concentration of wealth in Indonesia also experiences inequality, with the bottom 50% only owning 5.46% while the top 10% of the population owns 60.2% of total national household assets in 2021. In trend, the asset control of the richest 10% of the population has increased. Compared to two decades ago which was only 57.44%, while the poorest 50% of the population are even poorer with previous asset control in 2001 of 5.86%.

This phenomenon of unequal carbon footprints and the concentration of national wealth makes the implementation of a wealth tax in the context of mobilizing community-based renewable energy funds feasible. In addition, the probability that this policy can and has the potential to be implemented is based on. The Prakarsa Study in 2022 entitled implementation of Wealth Tax in Indonesia: Potential and Opportunities,[63] revealed that:

- The potential wealth tax based on the modeling carried out is between 54 trillion and 155.2 trillion equal with US$ 3.38 billion-US$ 9.70 billion;
- Wealth tax is possible to apply at a progressive rate of 1-2 percent and applies to HNWI (High Net Worth Individual) with net worth ≥IDR 144 billion;
- The wealth tax has the potential to be supported by HNWI as a tax subject with several notes and is supported by the majority of parliament members who are research sources.

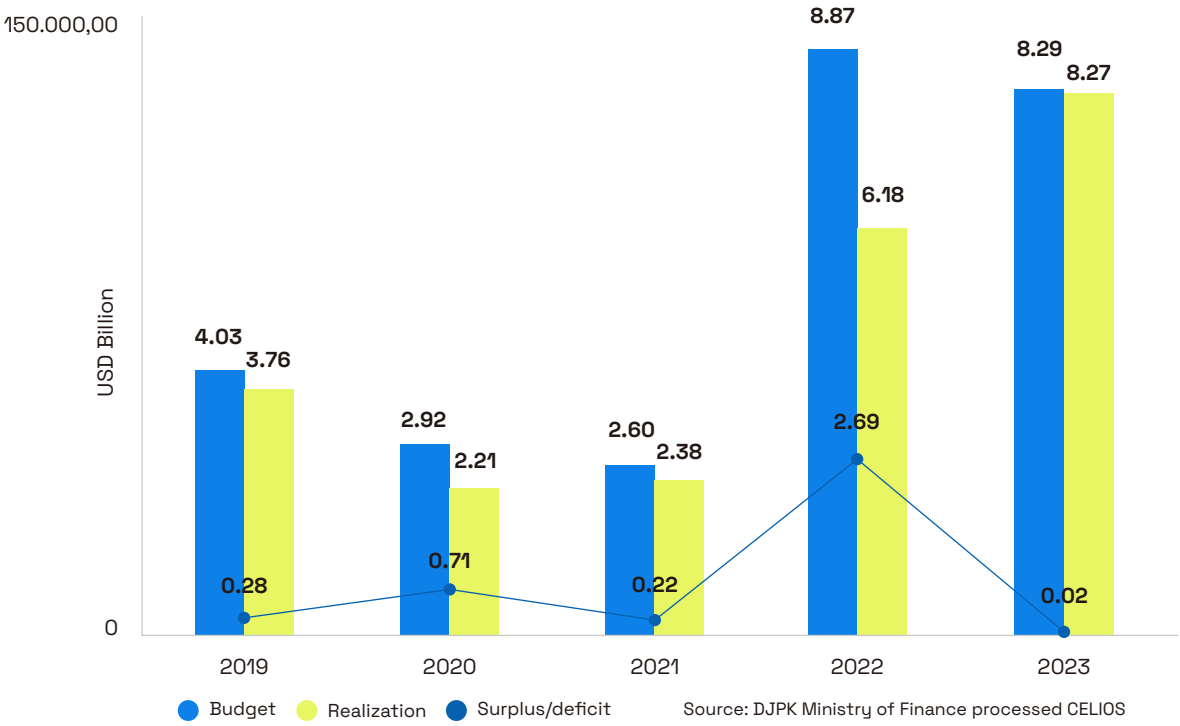
63 Initiative. (2022).Implementation of Wealth Tax in Indonesia: Potential and Opportunities. Initiative. https://theprakarsa.org/penerapan-pajak-kekayaan-di-indonesia-potensi-dan-peluang/

M. APBD (Reallocation of DBH SDA)

The potential for renewable energy funding through the APBD mechanism is quite large. One potential budget item that can be utilized is the Natural Resources Revenue Sharing Fund (DBH). So far, DBH SDA funds have not always been used to mitigate climate change and develop clean energy, including the development of community-based renewable energy.

The government in the 2024 RAPBN Financial Note plans DBH SDA of US$ 5.25 billion. However, the realization of the budget is still not optimal, which results in a surplus or large remaining funds. The last five years from 2019-2023 produced a surplus of more than US$ 3.91 billion.

Revenue Sharing Fund of Natural Resources Realization 2019-2023



The data above shows that regional governments receiving regional DBH SDA transfers are still not using their budget optimally, so this could be an opportunity for renewable energy funding. In the budget realization for the last five years, only in 2021 there was a deficit or realization that exceeded the budget, while in the rest there was always a budget surplus.

The potential for community-based renewable energy funding can be obtained by implementing policies earmarking on Natural Resources DBH, especially on Natural Resources DBH related to oil, gas, minerals and coal because their activities give rise to negative externalities. In 2022 alone, DBH SDA from the extractive sectors will experience a surplus of IDR 36 trillion equal with US$ 2.25 billion.[64] The central and regional governments can also allocate these funds to natural resource endowment funds where investment results can be used for funding. The central government needs to support this policy with performance incentives for local governments that are able to be optimal and creative in distributing DBH SDA funds for community-based renewable energy development. Apart from that, local governments need to be creative and open public discussions with local communities so that implementation can be maximized.

N. Environmental Fund Management Agency (BPDLH)

In accordance with its mandate in statutory regulations, BPDLH is the body tasked with managing Environmental Funds (DLH) in a number of fields, one of which is energy and mineral resources.[65] As of 2023, this agency has succeeded in raising funds of IDR 1.7 trillion (US$ 106.25 million) or almost 6 times the target of IDR 350 billion (US$ 21.88 million).[66] Therefore, funds managed by this agency can be an alternative financing for community-based renewable energy adoption initiatives.

O. International cooperation (Grants or JETP Technical Assistance etc.)

In the draft JETP investment plan for Indonesia, the value of funds that have been identified as grants and technical assistance is only a modest 1.47% of the total initial funding commitment until 2030 of US$20 billion or US$ 295,4 million.[67] This portion is quite small compared to soft loan-based financing schemes orguarantee. Thus, it can be concluded that currently the realization of renewable energy infrastructure in Indonesia through multilateral financing assistance is still dominated by funding schemes that tend to be commercial (although not entirely so).

64 DJPK Ministry of Finance. (2024).National TKDD Posture [dataset]. https://djpk.kemenkeu.go.id/portal/data/tkdd?tahun=2023&provinsi=--&pemda=--.

65 BLU FINANCIAL MANAGEMENT DEVELOPMENT DIRECTORATE, DIRECTORATE GENERAL OF TREASURE, & India Ministry of New and Renewable Energy. (n.d.).Environmental Fund Management Agency. https://blu-djpb.kemenkeu.go.id/index.php?r=publication/blu/view&id=248

66 Ibid

67 National Energy Transition Task Force Implementation Team. (21 November 2023).Just Energy Transition Partnership Indonesia: Comprehensive Investment and Policy Plan 2023. https://jetp-id.org/storage/official-jetp-cipp-2023-vshare_f_id-1703731480.pdf.

If you use more than 400 watts,
the electricity will go out.
The next day the power will be charged again.
Only 400 watts are given per family.
During the use of electricity
from solar plant power in 2017,
residents never incurred any costs.

Photo: Unsplash.com

Case Study of Solar Plant Karangasem Bali Grant

Before 2017, Nyoman Purna still used "lampu teplok" (oil lamps) for lighting in his house. Likewise, Nengah Subagia, head of the Manik Aji region, before there was electricity, carried a torch when there was a religious ceremony at Manik Aji Dusun Temple, Ban Village, Karangasem Regency, Bali. Previously, residents of Manik Aji hamlet such as Nyoman Purna and his neighbors went to bed early, because if they stayed up late they would use up more oil for lighting.
The story changes, the electricity request submitted in 2016 and realized in 2017 made the activities of residents in Manik Aji Hamlet feel more active even though it was dark. The presence of rooftop solar panel which was realized from the application for a power plant grant to the Ministry of Energy and Mineral Resources has become a lighting solution for the Manik Aji community.

Electricity from solar plant is used to light 17 houses, 2 temples and 1 for banjar (traditional hall). The condition is to look for a house that is close to each other or 'one place'. The furthest location of the house is around 300 meters from the PLTS.

"PLN cannot enter Manik Aji because the road access is steep, when we applied for electricity we got solar plant," said Nyoman Purna, PLTS operator officer at Manik Aji.

To ensure equal availability of electricity for the 17 families, each family is given 400 Watts per day, 400 Watts if only used for lights, would be enough. If he uses all the electrical power from solar plant for all activities in his house, there is a risk that he will run out of electrical power before night falls. To regulate the flow of electricity so that it is even, each house gets a restriction or limiter as an indicator of remaining electricity availability.

"If you use more than 400 watts, the electricity will go out. The next day the power will be charged again. "Only 400 watts are given per family," he added. "During the use of electricity from solar plant power in 2017, residents never incurred any costs."

According to him, there was quite a change after residents had electricity. Among them, residents can now use electronic equipment such as televisions, refrigerators and cooking tools.

Likewise with activity time. Before electricity was available, residents were active until 8 pm at most. But after electricity, activities can be longer, including making it easier for children to study at night.

"Now my mother uses a machine to grate the coconuts she sells; in the past, she still used a hand grater," said Purna.
"I am still grateful for our request for electricity to be provided by the government, even in the form of solar plant. The important thing here is that we have to be economical with electricity. Use it sparingly, such as with lights and charging cell phones. "As for TV, it's rare. Otherwise, the daily electricity quota runs out," said Nyoman Purna.

P. Debt Swap for Energy Transition

Creative forms of financing that exchange foreign debt with support for community-based energy can be done. Previously, the Indonesian government carried out a debt swap for nature initiative, namely exchanging foreign debt for forest conservation. Similar initiatives with different outputs in the context of supporting the energy transition need to be carried out. Technically, the Indonesian government has opened room for renegotiation of interest and principal payments on debt to creditor countries. So, instead of adding new debt to expand fiscal space for the energy transition, another option is to reduce debt. Money from savings from foreign debt payments will be used to provide direct grants to communities in the form of cash funds for renewable energy installations.

Other schemes could also be in the form of assistance to communities preparing technical needs, for example training for micro-hydro or solar energy operators. Debt swap for energy transition It can be done bilaterally, for example Indonesia with the US, UK, Germany and even China, or it can be done multilaterally through the JETP scheme.

Photo: 350.org Indonesia

Alternative Funding Models for Community-Based Renewable Energy in Other Countries

A number of countries have implemented community-based renewable energy funding using several different models, including India, Japan, and the Netherlands. From observations of the case studies below, funding models for electricity generation projects from renewable energy sources are generally widely supported by the government and the community.

India

India implements several funding programs such as PM-KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan) to support the achievement of national targets for renewable energy sources. PM-KUSUM focuses on farming communities in rural areas, which is planned to be implemented until the end of March 2026.[68,69].

Financial support PM-KUSUM most comes from the central government. There are three components to this scheme:

Component A

Solar capacity of 10,000 MW through the installation of small Solar Power Plants (PLTS) with a capacity of 500 kW – 2 MW per unit built by farmers individually or in groups or under the auspices of an entity that acts asSolar Power Generator (SPG) (Can includes cooperation/ panchayat/Farmer Producer Organisations/Water User associations). In certain cases, PLTS can also be built through developers orDistribution Companies (DISCOM) which is an electricity distribution company that can also act as SPG. In this case, DISCOM will carry out selection for parties interested in building PLTS. Additionally, DISCOM also plays a role in monitoring and informing about excess capacity at PLTS sub-stations which can be fed to the electricity network (grid).

The electricity produced will be purchased byDISCOM based onfeed-in-tariff (FiT) which is determined by State Electricity Regulatory Commission (HEART) or each state's electric regulatory commission. Furthermore, DISCOM will get whichever is lower between Procurement-Based Incentives (PBI) of Rs. 0.40 (US$0.005) per unit purchased or Rs. 6.6 lakh per MW per installed capacity from the ministry of energy for five years from the date of commercial operation of the solar PV plant concerned.

68 India Ministry of New and Renewable Energy. (n.d.). PRADHAN MANTRI KISAN URJA SURAKSHA EVAM UTTHAN MAHABHIYAN. https://pmkusum.mnre.gov.in/landing-about.html

69 India Ministry of New and Renewable Energy. (2023, March). Central Financial Assistance provided to States for Promotion of Solar Energy. https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1909271

Component B

Component B is intended to support the installation of standalone solar powered water pumps worth 20 lakhs. Individual farmers will be supported to install off-grid solar-powered irrigation pumps up to a certain capacity.

Financing for this component consists of several sources:

Source	Portion
Central government through Central Financial Assistance (CFA)	30% of the benchmark fee or tender fee, whichever is lower
State government subsidies	30%
Independent funding by farmers or loans from banks	40% (30% of which can come from bank loans)

CFA can be as high as 50% of the lower of the benchmark or tender costs for standalone solar pumps to be provided in certain states. In these states, state government subsidies will account for at least 30% of the funding portion; and the remaining maximum 20% will come from independent funding by farmers.

Komponen C

This component is intended for solarization of grid-connected water pumps worth 15 lakh (US$1,795) or Feeder Level Solarisation (FLS).

For irrigation pump solarization, individual farmers who have network-connected irrigation pumps will receive support for implementing solarization to produce electricity for agricultural irrigation needs. In addition, the excess electricity capacity produced can be sold to DISCOM.

The portion and sources of financing for solarization of water pumps are the same as Component B and also singled out a number of states to obtain larger subsidies from CFA. The portion of costs that will be subsidized by CFA is also more or less the same as Component B

Meanwhile, Component C for FLS focus on agricultural feeders. Financing can be provided for eitherfeeders mixed (without separation for agricultural and non-agricultural activities) or separation of feeders for each of these activities (conversion feeders mixed to non-mixed). Loans are provided by government-owned institutions or companies. Solar panel with a capacity that can meet load requirements feeders can be installed via the CAPEX/RESCO model[70] for a project tenor of 25 years.

Farmers will get power for irrigation purposes during the day free of cost or at the rates set by their respective states.

70 CAPEX (Capital Expenditures): In this scheme the consumer has a claim of ownership of the solar panels because he also pays the capital costs of the solar panels and their installation.
RESCO (Renewable Energy Service Company): Equivalent to the OPEX (Operating Expenditure) model. In this scheme consumers only pay for electricity produced from solar panels without claiming ownership of the solar panels, usually with long-term contract rules. Solar panels are owned by certain entities, for example solar panel providers who also carry out installations.

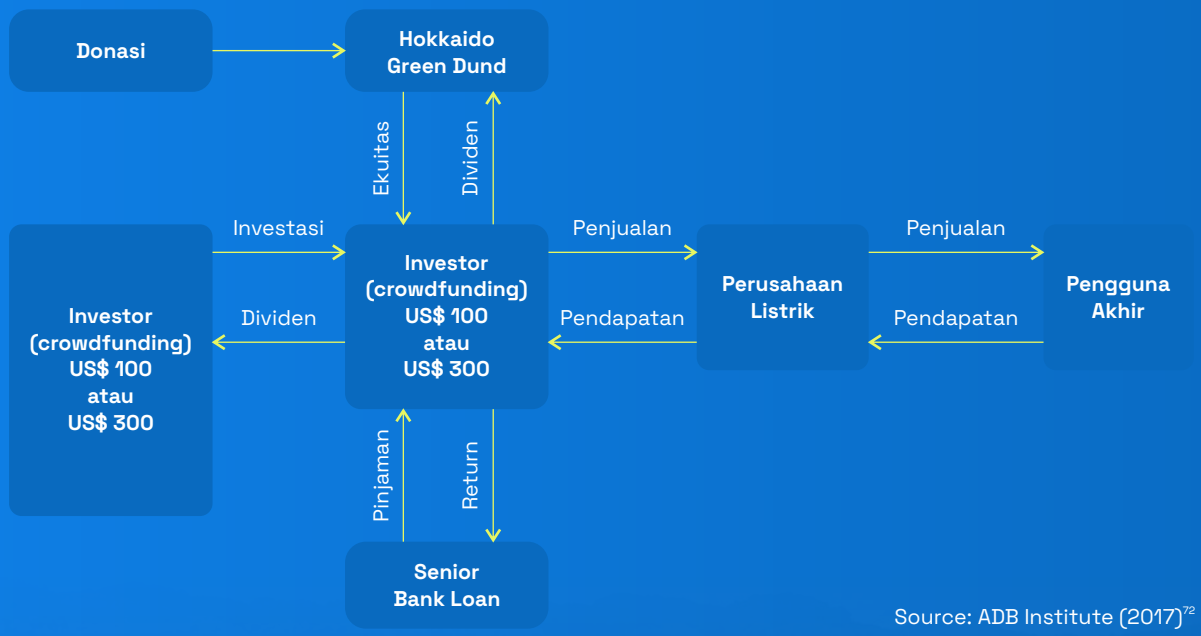
Japan

Hokkaido Green Fund in Japan is another example of implementing community-based green energy funding. Even though the context is in a developed country, this funding mechanism can be used as a case study for the success of community-based renewable energy financing.[71].

Financing in this scheme mostly comes from donations and a small part from banking. Funding is distributed to power generation companies from renewable energy sources to produce electricity. Next, the electricity is sold to an entity whose role is to distribute it to consumers. Apart from that, local regional governments can also contribute to funding (for example for solar power plants).

It can be concluded that in many schemes operated in Japan, funding is mostly supported by donations and crowdfunding from local communities and governments with minimal private sector support.

Financing Scheme of Hometown Investment Trust Funds



Source: ADB Institute (2017)[72]

71 ADB Institute. (2017, April). Hometown investment trust funds: A sustainable solution for financing green energy projects. Asia Pathways. https://www.asiapathways-adbi.org/2017/04/hometown-investment-trust-funds-a-sustainable-solution-for-financing-green-energy-projects/

72 ADB Institute. (2017, April). Hometown investment trust funds: A sustainable solution for financing green energy projects.

Netherlands

Crowdfunding is also a popular scheme in the Netherlands. For example, programs WeShareSolar which connects communities that have land for installing rooftop solar PV but do not have funds with communities that have excess funds but do not have land for installation (for example, residents who live in apartments or in areas where their roofs are not intensively exposed to sunlight)[73].

Contributors to funds in this program can set aside funds starting from US$26.88 or IDR 430 thousand with an investment return rate of around 3% to 6% per year.

It can be said that the role of the private sector is quite small in the scheme of things in these three countries. Most likely, this can be explained byappetite the financial sector is quite different. Banking, especially large-scale entities, tends to focus on activities at the corporate level and large business entities. This can be related to the characteristics of the capital and resources of the financial service provider. Financial service providers who do not have much experience at the micro or MSME financing level may have reluctance and difficulty channeling credit to the community sector.

From the three case studies above, it can also be identified that each country has different characteristics of needs at the community level. India emphasizes adoption at the agricultural community level. Meanwhile, Japan and the Netherlands focus on the residential sector. The capabilities of each community, fiscal capabilities, and political structures in these countries are different so that the strategies implemented by their governments are also different. India tends to implement funding strategies based on central and regional government subsidies, possibly because the agricultural community does not yet have the capability to do crowdfunding.

Most of India's population lives in rural areas and works as farmers but is still trapped in poverty.[74] In contrast, in developed countries such as Japan and the Netherlands, communities have the capacity to set aside funds and mobilize resources in an organized manner so that the government's role is only as an enabler. In the Indonesian context, each region can have different capacities so that policies for each region can be adjusted to the capabilities of the people in that region.

73 United Nations Climate Change. (n.d.). Crowdfunding for Community Solar Projects | The Netherlands. United Nations Climate Change. https://unfccc.int/climate-action/momentum-for-change/financing-for-climate-friendly-investment/crowdfunding-for-community-solar-projects

74 The World Bank. (n.d.). India: Issues and Priorities for Agriculture. The World Bank. https://www.worldbank.org/en/news/feature/2012/05/17/india-agriculture-issues-priorities

Challenges of Community-Based Renewable Energy Funding

In general, there are a number of challenges in community-based renewable energy funding that need to be overcome to increase support for activities in small units of society in the adoption of renewable energy sources.

A. Accessibility of Grants and Community Credit Funds for Renewable Energy Funding

The first obstacle is the community's difficulty in accessing grant funds. This difficulty does not exclusively occur in the context of renewable energy funding. For example, in certain regions, delays in issuing technical instructions or directions for the use of grant funds hinder the disbursement of regional grant funds for use by the community.[75] In addition, in the specific context of renewable energy funding, there are a number of barriers to access to schemes such as Green Climate Fund (GCF). One of them is the obligation to fulfill technical requirements which are quite challenging for grassroots communities,[76] for example, such as creating a legal entity, proposals, appointing operators, etc.

In fact, in obtaining GCF the general public needs to compete with the private sector.[77] In overcoming this obstacle, there needs to be support from organizations that have the capability to help or act as intermediaries between the community and funding providers and increase the community's capability in meeting technical requirements and gaining access to grant funds.

The next difficulty is a classic problem such as limited access to credit for the community. Basically, there are not many financing products aimed at community needs. Most banking products are intended for commercial purposes for the private sector at various scales (from micro level to multinational corporations). Until now there has been no credit specifically intended for the use of renewable energy at the community level, although there have been offers of household credit for installing rooftop solar PV.

B. Lack of Commitment from the Banking World for Renewable Energy Funding

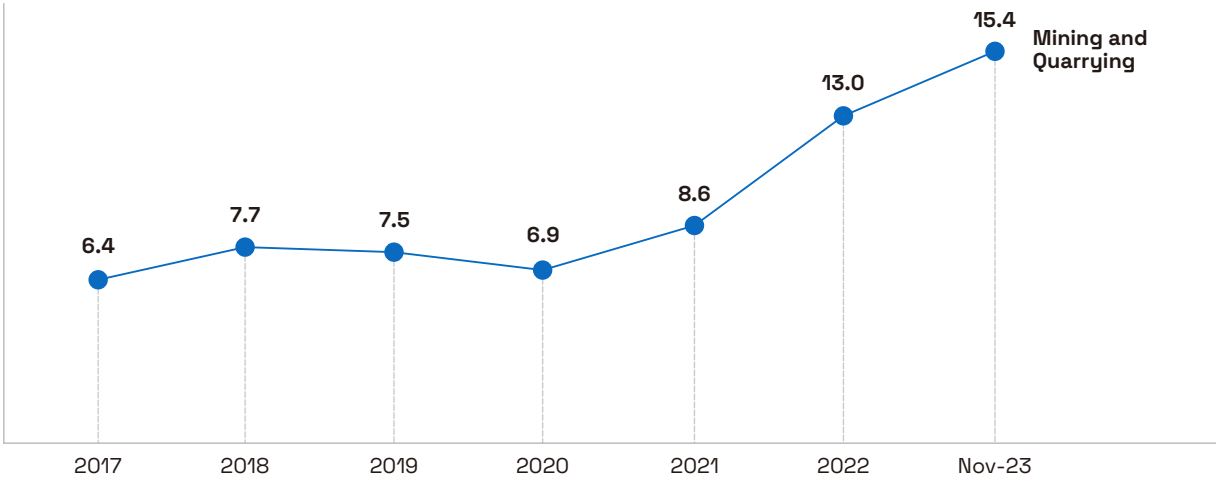
It can be said, these various difficulties are also related toappetite banking financing which still funds the fossil energy and coal power sectors. As of October 2023, total banking financing to this sector is still around 280.4 trillion rupiah and there is even an upward trend.

75 West Sumatra Provincial Government. (2015, June).Grant Funds Still Unclear. https://sumbarprov.go.id/home/news/5049-dana-hibah-masih-tak-jelas

76 Fauziah, M. (n.d.). People Difficult to Access Climate Finance.Republic. https://ekonomi.republika.co.id/berita/mi3c55/rakyat-sulit-mengakses-pendanaan-iklim#google_vignette

77 Ibid

Graph: MarkCredit/Financing from Commercial Banks to Non-Bank Third Parties for the Mining Sector (in trillion rupiah) December 2015 – October 2023



Source: Indonesian Economic and Financial Statistics December 2023[78]

On the other hand, the regulatory infrastructure of the financial industry also does not provide sufficient incentives for banks to channel greater funding for renewable energy at the community level. For example, even though there are household credits for installing rooftop solar PV, currently the financing scheme for solar panel ownership is still limited to loans without collateral.[79]

Therefore, solar panels are still not considered collateral for financing. Until now, apart from the portion of renewable energy credit in total bank financing, there are no banking supervision indicators that specifically aim to measure and encourage more varied credit schemes to encourage the adoption of renewable energy sources, especially at the community level.

To overcome this challenge, regulators can include renewable energy financing at the community level in measuring the Macro-prudential Inclusive Financing Ratio (RPIM) to increase incentives for banks to channel this financing. RPIM has been used by regulators to encourage the distribution of inclusive financing, especially to the SME sector through a number of modalities such asloan channeling, executing, as well as syndication.

In organizing financing to fulfill the RPIM, banks can collaborate with institutions such as "BPR (Rural bank) or BPRS (Islamic rural bank), non-bank financial services institutions; and/or funding cooperation with public service agencies and/or business entities that have the authority to manage Bank funds for Inclusive Financing in accordance with the provisions of laws and regulations."[80] In the context of renewable energy financing, regulators can consider community level renewable energy financing as an inclusive financing category in fulfilling the RPIM.

78 SEKI-DECEMBER-2023." Bank Indonesia.

79 Astuti, Y. (2021, February). BRI Finances Installation of Solar Cells at Home, Cheap & Without Collateral.CNBC Indonesia. https://www.cnbcindonesia.com/market/20210204111008-17-220960/bri-biayai-pasang-solar-cell-di-rumah-murah-tanpa-agunan

80 REGULATIONS FOR IMPLEMENTING MACROPRUDENTIAL INCLUSIVE FINANCING RATIO FOR CONVENTIONAL COMMERCIAL BANKS, SHARIA COMMERCIAL BANKS AND SHARIA BUSINESS UNITS, NUMBER 24/ 6 /PADG/2022 (2022). https://www.bi.go.id/id/publikasi/peraturan/Documents/PADG_240622.pdf

OJK could also consider providing credit for community-based renewable energy adoption to be categorized as green funding in the Indonesian Sustainable Taxonomy to encourage banks to support this initiative. This is worth implementing because the green taxonomy is one of the financial sector policy tools that aims to promote a just energy transition.

Apart from that, there are a number of other solutions that can be implemented to overcome financing obstacles in the banking sector. For example, margin subsidies, increasing credit analysis and risk management capabilities for community-based renewable energy distribution, collaboration with civil society organizations, and categorizing the fossil and coal sectors into the "red" or "red" groups non-eligible".


Photo: 350.org Indonesia

C. Public awareness and interest in renewable energy is still low

Funding constraints do not only occur from the supply side but also the demand for funding, especially fundamentally related to the demand for renewable energy itself. One possible explanation is the current societal paradigm that electricity supply from PLN is currently still the desired alternative.[81] This situation indicates that there is still a tug-of-war between fund providers and requests for funds for the need to adopt renewable energy at the community level.

81 Osa, S., & J, M. P. J. (2021, June). Cooperatives Have the Opportunity to Work on Rooftop PLTS.Kompas.Id. https://www.kompas.id/baca/ekonomi/2021/06/23/peran-koperasi-untuk-perubahan-iklim-belum-terpetakan.

Community experience in starting renewable energy initiatives Study of Kedungrong Hamlet, Yogyakarta Special Region

The history of micro hydro in Kedungrong Hamlet is quite long. This power plant was established at the end of 2012. Initially, the construction of this micro hydro was an initiative program of KKN (Real Work Lecture) participants from UGM (Gadjah Mada University), Yogyakarta.

After that, in 2011 the Yogyakarta Public Works, Housing and Mineral Resources Energy (PUPESDM) Department emerged which initiated the outreach. This socialization took almost 1 year, then construction of the Microhydro Power Plant (PLTMH) began in the village.

Previously, local residents rejected the existence of the micro hydro, due to a lack of sufficient information regarding how the plant worked. However, as time went by and information became more complete, the residents of the hamlet finally agreed.

After obtaining the residents' approval, with assistance from the department and civil engineering experts, the micro hydro power plant was built. Through deliberation in the hamlet, residents determine who will be the management of the power plant. It doesn't stop there, residents, especially those mandated as local technicians to maintain machines, are equipped with knowledge about how the tools work and assemble. The goal is so that local technicians can independently maintain the equipment. "So, at the start of construction, several people, including me, were sent to school at the factory to be given education on tool assembly and how the tools work," said Rejo, a local technician at the Kedungrong Hamlet micro hydro.

The local government also supports maximum use of micro hydro. The Department in Kulonprogo Regency provides full support for the development of micro hydro through the ease of regulations provided. They also provide guidance regarding the development of micro hydro so that it can increase the impact and benefits for residents[82].

D. The regulations that support renewable energy are unclear

One of the challenges with funding renewable energy in general and specifically for communities comes from problems with laws and regulations. The government, in terms of regulating renewable energy and decarbonization policies, is still considered not to have strong legal infrastructure and does not uphold a just energy transition. The development of renewable energy and energy transition is actually mandated in Presidential Regulation No. 112 of 2022, which includes a coal retirement policy and one of them is through JETP. However, until now there are still regulations in the energy and electricity sector.

White Paper JETP (2023)[83] noted several challenges and obstacles in the legal and regulatory fields. First, there is no legally binding energy transition target. In fact, the JETP scheme to achieve zero net emissions in the electricity sector by 2050 and an energy mix of 34% by 2030, as well as a target of 290 million tons of CO2 equivalent in 2030, is different from the targets in the government regulation PP 79/2014 and RUKN-General Electricity Plan. The regulation targets a renewable energy mix in 2025 of 23% without early retirement of fossil energy generators. In addition, RUKN targets net zero emissions to be achieved in 2059 and peak emissions in 2030 of 473-478 million tons of CO2, which is slower and much different from JETP.

82 Ade Zahra Putri A & Audia Nuriasari, CR Yogyakarta, Cheap Electricity from Kedungrong Hamlet, 2023

83 Triasdian, et al. (2023). White Paper JETP. Can JETP's Investment and Policy Plan Promote A Just and Ambitious Energy Transition In Indonesia?. https://celios.co.id/wp-content/uploads/2023/White%20paper%20JETP%20CSO%20ENG.pdf

Then, there is no framework and road map for a just energy transition. This is important because it is needed to serve as a guide in future policy plans and programs so that they do not deviate from the definitions, goals, principles and targets set. The road map created later must be able to ensure that the existing clean energy transition is not riddled with false solutions, involves public participation, and protects vulnerable communities. In addition, it is necessary to regulate social security and prepare for the transition to green jobs with upskilling and reskilling which is adequate.

Challenging Regulation of Sales of Excess Solar Panel Electricity to PLN

Recently President Jokowi agreed to eliminate the export and import of rooftop solar panel electricity (PLTS) with PLN (net metering), considering the current condition of PLN's excess electricity supply.[84] The implication is that consumers can no longer sell excess electricity capacity produced by solar plants installed on the roofs of their homes or export solar rooftop electricity as a bill reduction. Instead, the quota system and its amounts will be determined by the Ministry of Energy and Mineral Resources and enforced by PLN.

There is some debate surrounding this policy. A number of parties who criticize this policy claim that this policy will reduce incentives or attractiveness for consumers (especially household consumers).[85] Instead of the government opening up space for household scale solar plants users to sell their excess electricity as an incentive and at the same time helping PLN's renewable energy mix increase, the quota policy is actually counterproductive.

A number ofchallenges can arise from implementing quota policies. The first challenge is in determining quotas. As we know, solar plants is very dependent on weather and sunlight intake. If the quota obtained by consumers is too small, there is a possibility that the electricity supply will be less stable or reliable, causing losses for users. On the other hand, if the specified quota is too large in conditions without itnet metering, then the user's electricity costs will likely be quite large or not much different from conditions when the quota was not implemented.

In addition, setting quotas is also likely to cause technical difficulties. How should consumers calculate the capacity of rooftop solar panel that needs to be installed? What if consumers need a quota increase? For customers on an industrial scale, this policy will likely be responded to by increasing interest in solar panel batteries for solar power storage off-grid if for them economically and practically it is superior to using the ESDM and PLN quota systems. This may happen even though currently investment in solar panel energy storage batteries is quite expensive and requires a fairly long tenor for return on capital.[86]

Considering these various conditions, could community-based solar PV installation be an alternative? We can create a model that takes into account how collective solar panel with various alternative capacity quotas in an area can produce cheaper electricity costs than PLN for its users. Especially, fixed costs The solar panel investment will be divided among members of the community. The government can provide incentives for adopting solar panel without burdening the state fiscal if it collaborates with financing institutions that are able to support this initiative.

With medium-scale capacity and used collectively, and supported by a financing scheme that does not burden members of the user community, community-based solar panel adoption can have a greater impact than a narrow focus on individual household segments and reach the community more evenly than solar panel projects large scale and industrial.

84 Muliawati, F.D. (February 6, 2024). Jokowi has agreed! Consumers Cannot Send Rooftop PLTS Electricity to PLN.CNBC Indonesia. https://www.cnbcindonesia.com/news/20240206103134-4-512209/jokowi-sudah-setuju-konsumen-tak-bisa-kirim-listrik-plts-atap-ke-pln.

85 Wahyudi, N.A. (January 16, 2023). Plans to Eliminate Electricity Exports, Rooftop PLTS Reap Criticism and Concern.Bisnis.com. https://ekonomi.bisnis.com/read/20230116/44/1618673/rencana-penghapusan-ekspor-listrik-plts-atap-tuai-kritik-dan-kekhawatiran.

86 Rahayu, A.C. (21 May 2023). A number of rooftop electricity users are starting to choose to use PLTS batteries, here's the reason.Kontan.co.id. https://industri.kontan.co.id/news/sejumlah-pengguna-listrik-atap-mulai-pilih-gunakan-baterai-plts-ini-alasannya.

Furthermore, the problem of Law No. 3 of 2020 concerning Mineral and Coal Mining which increases the coverage of mining areas; relaxing reclamation obligations; provide guarantees for easier permit extensions; and eliminating criminal threats to public officials. Presidential Decree No. 14 of 2017 concerning the Acceleration of Electricity Infrastructure Development is a problem because it gives space to fossil energy.

Meanwhile, the EBT Law and Presidential Decree No. 112 of 2022 concerning the Acceleration of Renewable Energy Development still include fossil energy and false solutions, namely the construction of coal-fired power plants in accordance with the RUPTL during oversupply and the exception of the construction of captive power plants. Therefore, the government needs to immediately pass the EBT Bill and involve public participation in its drafting, including listening to public input regarding eliminating false energy transition solutions and strengthening equitable aspects, including the importance of community-based renewable energy funding.

In fact, renewable energy investment is still considered unsafe from a policy perspective. Minister of Energy and Mineral Resources Regulation No 10/2017 transfers the risk entirely to the developer when there is a change in government policy. Then, Ministry of Energy Regulation no. 50/2017 resulted in renewable energy projects being considered as projects that are difficult to obtain funding from banks (unbankable).

E. Slow/unresponsive licensing bureaucracy

Challenges in the licensing sector in the development of renewable energy are a non-trivial issue. A report by the audit institute Ernst & Young (EY) revealed that funding is not the main obstacle to developing renewable energy in Indonesia but licensing issues, especially for developing utility-scale solar and wind generators.[87] In the report, which took data from 170 consultations with developers, lenders, investors, industry associations and Direct Foreign Investment (DFI), information was obtained regarding the nine countries in Asia that were analyzed, including Indonesia.

Bureaucratic processes that become obstacles are often related to permits, difficulties in land acquisition, lack of local supply chains, and content requirements that are difficult to fulfill. These factors will have a big influence on financing terms because they are related to project risk, time period, costs and bankability, making loans expensive.

Cases of difficulty in licensing renewable energy development were found in Papua. Difficulties and lengthy bureaucracy in licensing make business actors complain. The central government as the party giving permits is considered to be hampering the performance of the regional government licensing bureaucracy which has already been completed. This happened in the case of PT Anekatek Consultant in 2014 which started a pilot solar energy power plant project in Papua, one of which was in Abar Village. Licensing processing by regional governments from 2015 to 2019 was felt to be slow and inadequately responded to by the center, namely the Ministry of Energy and Mineral Resources.

87 Praditya, I.I. (2023). Renewable energy development problems in Indonesia: Complicated licensing. Liputan6.com. https://www.liputan6.com/bisnis/read/5462947/masalah-pengembangan-energi-terbarukan-di-indonesia-perizinan-ribet?page=3

This case example is not community-based development, but company-based, but it can be a lesson in how unresponsive the existing licensing bureaucracy is. Therefore, the government needs to immediately respond to this challenge by clarifying and making the licensing process for renewable energy development more efficient and easier, including community-based ones.

F. Lack of fiscal incentives

Fiscal policy is important in renewable energy funding programs, because it can be an initial investment and shows the government's commitment. However, until now, the government is considered to have not provided progressive fiscal policy support, either in providing incentives for renewable energy or in providing disincentives for fossil energy, especially for communities.

In fact, the government has issued several fiscal incentive policies in developing new energy andrenewable,[88] namely:

- Tax holiday through PMK 130 of 2020 in the form of reducing corporate income tax by 50% or 100% for 5-20 years.
- Tax allowance through PP 78 of 2019 in the form of a 30% reduction in net income, 10% PPH on dividends, accelerated depreciation & amortization, additional compensation for losses over 5 years
- Super Deduction R&D through PMK 153 of 2020 in the form of a maximum reduction in gross income of 300%, namely a reduction in gross income of 100% of the total real costs; and additional reduction of a maximum of 200% of the accumulated costs incurred for research and development activities within a certain period.
- Vocational Activity Incentives through PMK 128/PMK.010/2019 are in the form of a maximum gross income reduction of 200%.
- VAT Exemption Incentive through PP 48 of 2020 as a revision of PP 81 of 2015
- Import Duty Exemption Incentive for capital investment through PMK 176/2009 jo. PMK 188/2015 concerning Exemption from Import Duty for Industry in the Context of Capital Investment and PMK 66/2015 concerning Exemption from Import Duty on Imports of Capital Goods for the Electric Power Generation Industry
- Support for geothermal development through PISP facilities: reducing the risk of the geothermal exploration phase Through PMK 80/2022 concerning Support for Geothermal Development through the Use of PISP Funds at PT SMI in the form of providing funding support for exploration and exploration financing.

The series of fiscal incentives for funding new and renewable energy provided by the government still focuses on large-scale, capital-intensive businesses and national priority industries. For example, incentive requirements for tax holiday only given to pioneer industries with a minimum investment value of IDR 100 billion (US$ 6.25 million). Incentive on tax allowance also only given to national priority industries with the criteria of high investment value, large employment absorption, and high local content.

The regulations regarding vocational incentives provided do not focus on communities, but on educational and training institutions or institutions, so they do not directly provide benefits to the renewable energy development community. Funding support for exploration and

88 Rifan, A.A. (2022). Socialization: Fiscal Incentives for the Development of New and Renewable Energy Presidential Decree 112 of 2022. Ministry of Finance of the Republic of Indonesia.https://mebi.or.id/wp-content/uploads/2023/02/Paparan_Insentif-Fiskal-utk-Pengembangan-EBT-Perpres-112_2022_Kemenkeu.pdf

financing of geothermal exploration also focuses on the large-scale private sector, as do other incentives which the government claims are not specifically aimed at the community scale.

Discussion of the Indonesia Research Institute for Decarbonization (IRID) together with the Pikul Foundation in 2023 regarding financing for RE development, finding problems at the pre-installation stage often having difficulty in finding parties willing to fund the community or the public.[89] This is due to the absence of feasibility study, therefore this could be a space for the government to provide fiscal incentives, for example through village fund policies or initial investment capital assistance programs for renewable energy in the community.

G. Lack of socialization of potential funding from banks and the government to the community

Challenges in funding renewable energy can also come from a lack of socialization on the part of the government and banks, as can be seen from the lack of public knowledge of the Just Energy Transition Partnership (JETP) program.

The 2023 CELIOS survey, involving 1,245 respondents spread nationally, revealed that 76% of the public did not know that JETP.[90] The interesting thing is that based on regional distribution, information related to JETP is better understood by people in Bali than in other areas. This fact indicates that JETP information is more associated with the G20 agenda so that the distribution of information is not evenly distributed.

CELIOS research shows that low-income people are less likely to know about JETP than high-income people. Apart from that, the younger generation in the age range 15-24 and 25-34 years tend to know more about JETP information because they have better access to information and process new knowledge more quickly.

The root of the problem of low socialization from the government and banking is closely related to the policy level. The government needs to provide attractive incentives for the banking industry in funding the energy transition, in order to improve the performance of banking outreach and marketing in renewable energy products. This is important because banks still feel that the lack of incentives for renewable energy and disincentives for dirty energy causes the financing products offered to be unattractive to customers and/or reduces bank profits due to the absence of special rate.[91]

The government needs to implement incentives for banks to act as a stimulus to increase green funding. This business can be done with a tax discount stimulus for banks that have a significant renewable energy funding or financing portfolio. This stimulus will automatically be able to increase the attractiveness of banking products in financing renewable energy, thereby improving the performance of outreach to the public or customers.

The latest discourse regarding government incentives in the context of financing renewable energy comes from the Ministry of SOE which plans to provide cheap interest incentives for electricity generation business actors who are

89 WANTS (2023).Ensuring a Just Energy Transition in Indonesia: Reviewing Financing in EBT Development. WANTShttps://irid.or.id/memastikan-transisi-energi-berkeadilan-di-indonesia-meninjau-pembiayaan-dalam-pengembangan-ebt/

90 CELIOS. (2023). Public Opinion Survey regarding JETP (Just Energy Transition Partnership). CELIOS. https://celios.co.id/2023/survei-opini-publik-terkait-jetp-just-energy-transition-partnership/

91 Bank Initiatives and Responses 2022. (2022).Tracking the Banking Sector's Progress in Financing Indonesia's Energy Transition to Accelerate Net Zero Emissions. Bank Initiatives and Responses. https://www.responsibank.id/media/ss1pi0na/melacak-kemajuan-sektor-perbankan-dalam-pembiayaan-transisi-energi-indonesia-untuk-mempercepat-net-zero-emission.pdf

willing to reduce rates.the emissions.[92] This is positive from an energy transition perspective, but does not directly provide incentives for community-based renewable energy funding. This policy will not significantly increase the banking world's socialization and marketing of its green financing products.

Another factor that can influence the low levels of banking socialization and marketing of renewable energy funding products is the instability of renewable energy regulations. Banking needs regulatory stability so that investment costs do not increase due to occasional changes in regulations. The case of changes to rooftop solar PV regulations that cannot be sold to PLN is an example of regulatory instability that could make renewable energy funding unattractive and risk increasing investment costs.

Government and banking outreach to the public about community-based renewable energy funding will be a real challenge in the future. This is because the performance of both parties is still not optimal, because the policy products and banking products that will be socialized are still not attractive and stimulate the buying interest of the public or bank customers.

H. Community renewable energy has not been included in the electricity plan/including the JETP scheme

Apart from the grant portion which is still quite small compared to the total JETP funding, community renewable energy has not been one of the priorities mentioned explicitly in electricity plans including the JETP scheme. JETP investment plans tend to be dominated by industry roadmaps and include the following focus areas:[93]

- Development of transmission networks
- Early retirement and gradual reduction of PLTU in a managed manner
- Acceleration of dispatchable/stable renewable energy (geothermal, hydropower, biomass)
- Acceleration of variable renewable energy (solar, wind, waves/ocean currents)
- Development of renewable energy supply chains

There are a number of explanations why JETP has not accommodated community-based energy. First, there is still a dominant paradigm that the energy transition needs to focus on the implementation of large-scale generators (baseload) such as hydropower and geo-thermal.[94] Energy that is variable or micro in nature is perceived as unstable, dispersed, and requires additional costs such as battery storage (Energy Saving Storage-ESS). However, this paradigm can conflict with the principles of just transition. Large-scale power plants often trigger agrarian conflicts with surrounding communities because of the very large land requirements. In fact, investment costs for variable renewable energy are much lower, as evidenced by the investment costs per kW which are smaller than generators base load.[95]

92 CNBC Indonesia. (22 December 2023).Accelerating Energy Transition, Government Provides Cheap Interest Incentives Accelerating Energy Transition, Government Provides Cheap Interest Incentives.CNBC Indonesia. https://www.cnbcindonesia.com/news/20231222132329-8-499567/kebut-transisi-energi-pemerintah-beri-insentif-bunga-murah

93 Just Energy Transition Partnership Indonesia. (2023). Comprehensive Investment and Policy Plan 2023. JETP Indonesia.https://jetp-id.org/cipp.

94 Pandu, P. (15 August 2023).Communities Have Social Capital Manage the Energy Transition Fund. Kompas.id. https://www.kompas.id/baca/english/2023/08/15/en-komunitas-punya-modal-sosial-kelola-dana-transisi-energi.

95 Solar energy (utility-scale) costs $790 per kW while geothermal costs $4,000 per kW

In this regard, the lack of support for the adoption of community-based renewable energy also reflects the orientation of the current transition concept which is too focused on achieving Net Zero Emission (NZE) targets, so that large-scale initiatives dominate the transition discourse.[96] However, this narrow focus could threaten the sustainability of energy access for vulnerable community groups in the future. If the transition is carried out by excluding community groups who do not have access to alternative energy sources or even at all.

If you have adequate energy access, there will be communities left behind. This is of course contrary to the principle of a just transition.

Both of these things are indicated in the JETP CIPP document which was released in November 2023. For example, even for calculating renewable energy investment assumptions, the focus is on medium, utility and large scale generation and storage technologies **(Table 5)**. Although there is no agreed measure, it can be said that a "community scale" generator capacity ranges between individual household scale and utility scale or around 50 to 1,000 kW.[97]

In JETP there is no discussion regarding the installation of renewable energy generators initiated by communities or estimates of the investment required to meet the technical specifications for community-based renewable energy.

If 50% of the JETP funding commitment of US$20 billion is used to develop community-scale renewable energy, it can produce a capacity of 2.18 GW. Renewable energy plants are at least capable of replacing 3.3 PLTU units equivalent to Cirebon-1 which has a capacity of 660 MW.

Photo: CELIOS

96 Trend Asia. (June 19, 2023).Justice Is Threatened to Be Marginalized in the Plan to Accelerate Indonesia's Energy Transition. Trend Asia. https://trendasia.org/en/justice-is-threatened-to-be-marginalized-in-the-plan-to-accelerate-indonesias-energy-transition/.

97 Bronin and Wiseman. (2013).Community-Scale Renewable. 168.

Table 5. Assumed Investment Costs for Selected Technologies according to JETP CIPP[98]

Generation

Bioenergy (palm oil/rice husk)	2020 2000 (1300-2250) 2030 1820 2050 1600 (1200-2000)	**Geothermal** (large)	2020 4000 (2700-5750) 2030 3440 2050 2840 (1700-4550)
Hydropower (large)	2020 2080 (1650-2250) 2030 2000 2050 1850 (1400-2050)	**Hydropower** (medium)	2020 2290 (1400-5200) 2030 2200 2050 2040 (1400-5200)
Solar PV (utility-scale)	2020 790 (700-1200) 2030 560 2050 410 (310-710)	**Solar PV** (industrial)	2020 1190 (1050-1800) 2030 840 2050 620 (470-1070)
Wind (onshore)	2020 1500 (1200-2350) 2030 1280 2050 1080 (800-1850)	**Wind** (offshore)	2020 3500 (2400-3700) 2030 2980 2050 2520 (1550-2900)
Coal Power (subcritical)	2020 1650 (1000-1700) 2030 1600 2050 1550 (1050-1700)	**Coal Power** (supercritical)	2020 1400 (1050-1750) 2030 1360 2050 1320 (990-1650)

98 Just Energy Transition Partnership Indonesia. (2023). Comprehensive Investment Plan and Policy. 46-47.

with CCUS
(Carbon Capture, Usage and Storage)

2020
+1950 (1600-2290)
2030
+1790
2050
+1420 (1170-1670)

Coal Power
(ultra-supercritical)

2020
1520 (1140-1910)
2030
1480
2050
1430 (1070-1790)

Gas Power
(gas turbine)

2020
770 (650-1200)
2030
730
2050
680 (550-1100)

Gas Power
(combined cycle)

2020
690 (650-1000)
2030
660
2050
610 (550-900)

Storage

Battery
(utility-scale)
(US$/kWh)

2020
578 (455-920)
2030
264
2050
157 (75-398)

Pumped hydro storage

2020
860 (600-6000)
2030
860
2050
860 (600-6000)

Notes:
The uncertainty range is expressed in ( ); range is only available for 2020 and 2050. "+" means additional cost for the same technology without CCUS. Sumber:

Source:
Ministry of Energy and Mineral Resources andDanish Energy Agency, 2021 inJust Energy Transition Partnership Indonesia. (2023)

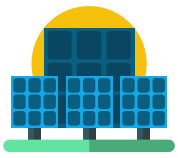
Assuming a JETP funding commitment of 50% or US$10 billion is capable of producing 2.18 GW of community-based renewable energy generation capacity

Photo: Unsplash.com

Scenario for Utilizing JETP Funds for Community-Based Renewable Energy

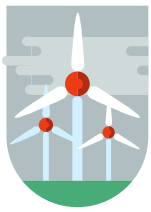
Pembangkit Listrik Tenaga Mikro Hidro (PLTMH)

Investment cost in US$/kW	CF (Capacity Factor)	Full CF Investment/kW
2,290	**0.70**	**3,271**



Solar PV

Investment cost in US$/kW	CF (Capacity Factor)	Full CF Investment/kW
790	**0.15**	**5,267**



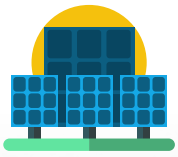
Onshore Wind

Investment cost in US$/kW	CF (Capacity Factor)	Full CF Investment/kW
1,500	**0.25**	**6,000**

JETP **US$ 20,000,000** 50% JETP **US$ 10,000,000**

Pembangkit Listrik Tenaga Mikro Hidro (PLTMH)

In kW	In GW	Proportion	Total based on portion (in GW)
3,056,769	**3.06**	**30%**	**0.92**



Solar PV

In kW	In GW	Proportion	Total based on portion (in GW)
1,898,734	**1.90**	**40%**	**0.76**

Angin (Wind Onshore)

In kW	In GW	Proportion	Total based on portion (in GW)
1,666,667	**1.67**	**30%**	**0.50**

Total **2.18**

*Investment costs are from CIPP JETP November 2023

**Capacity Factor for generating renewable energy from various sources

Table of Opportunities and Challenges for Community Renewable Energy Funding

Funding Type
Bank loans

Estimated potential funding value[99]
US$75 billion (term > 1 year)

Stakeholders
Banking, OJK, BI

Challenge

- Banks's lack of appetite for channeling funding for community-based renewable energy. According to the bank, the risk of distributing renewable energy is still considered high.
- Community technical readiness.
- Banks are still channeling financing to the fossil sector and coal power plants.

Recommendation

- BI needs to formulate incentives in the form of RPIM that takes into account community-based renewable energy.
- Margin subsidies for community-based PLTS credit.
- The bank prepares credit analysts and risk management for community-based renewable energy distribution.
- Collaboration with civil society organizations to facilitate the distribution of funds for renewable energy at the community level.
- The green taxonomy needs to categorize the fossil and coal sectors into "red" or "red" categories or non-eligible".

Funding Type
Cooperative financing

Estimated potential funding value[99]
US$375 million (term > 1 year)

Stakeholders
Cooperatives, Ministry of Cooperatives and SMEs, Regional Governmenth

Challenge

- Because renewable energy is a new area, cooperative members' awareness of renewable energy opportunities may still be inadequate
- Public demand for renewable energy is still not massive so the funds offered by cooperatives are not fully absorbed

Recommendation

- Increasing renewable energy adoption programs at the community level that have not yet been electrified with the support of local cooperatives that have high credibility in interactions with surrounding communities
- Arranging cooperation programs between financial institutions such as banking and cooperatives. This activity can also be categorized into RPIM calculations.

99 Pthe actual potential may far exceed the calculations in this table.

Funding Type
Direct investment

Estimated potential funding value[99]
US$ 10.6 billion (impact investing) (term > 1 year))

Stakeholders
Angel investors, modal ventura, private equity, impact investors

Challenge

- The possibility of investors stillwait and see because the renewable energy sector is still new
- Regulatory support for renewable energy is still at a pilot stage so there are still doubts from investors regarding the right time to increase financing commitments for renewable energy
- Investors in the venture capital sector are generally more interested in funding the activities of commercially oriented start-up companies

Recommendation

- Identify areas with small electricity needs so that the opportunity to pioneer electrification is still quite large and does not depend on PLN electricity
- Regulatory support and tax incentives to open up investment opportunities for foreign and domestic investors operating in the field impact investing
- There needs to be an execution project for the adoption of renewable energy at the community level that runs consistently and offers return for impact investing sectors

Funding Type
Capital Market

Estimated potential funding value[99]
US$4.37 billion (term > 1 year)

Stakeholders
Institutional investors, retail investors

Challenge

- Capital market funding focuses heavily on commercial entities
- The issuance of regional bonds, which can be used as a suggestion for community-based renewable energy funding, is still experiencing a number of challenges, especially because the fiscal capacity of each region is different

Recommendation

- Arrange financial instruments for impact investing to raise public funds to support community-based renewable energy (can be in the form of crowdfunding)
- Create innovative products that accommodate funding for community-based renewable energy adoption
- Regulatory support and tax incentives to open investment opportunities for foreign and domestic investors
- Identify regional resources that can be utilized for the manufacture of simple, low-cost power generation equipment that can be funded with thematic regional bonds

Funding Type
Village Fund

Estimated potential funding value[99]
US$10 billion/year

Stakeholders
Ministry of Finance, Ministry of Villages, Regional and Village Government

Challenge

- There isn't any yet earmarking village funds for funding renewable energy
- The number of villages that allocate funds for renewable energy is still small
- The percentage of village funds for funding renewable energy is still small

Recommendation

- The government needs to enact earmarking on Village funds for renewable energy amounting to 30% of total village funds with attractive support and incentives for villages that are optimal in implementation.

Funding Type
Reallocation of Fiscal Incentives

Estimated potential funding value[99]
US$2.11 billion/year

Stakeholders
Ministry of Finance

Challenge

- The government's fiscal incentives in the coal extractive sector with 0% royalties are detrimental to the APBN and APBD

Recommendation

- The government needs to reallocate the 0% royalty fiscal incentive by stopping this policy and encouraging a renewable energy funding policy from natural resource royalties.

Funding Type
Renewable Energy Endowment Fund

Estimated potential funding value[99]
US$7.23 billion/year

Stakeholders
Ministry of Finance, Ministry of Home Affairs, and Provincial/Regency-City Governments

Challenge

- The government's DBH SDA is still experiencing a surplus in its realization
- Many local governments at the provincial or district/city level have SiLPA

Recommendation

- The central government needs to make a regional government budgeting policy that can form renewable energy endowment funds originating from the DBH SDA and SiLPA surplus

Funding Type
Windfall Profit Tax

Estimated potential funding value[99]
US$23.8 billion/year

Stakeholders
Ministry of Finance

Challenge

- There is a phenomenon of windfall profit in oil and gas and coal companies in Indonesia have not yet exploited the potential for tax revenue

Recommendation

- The Ministry of Finance needs to implement policies on windfall profit tax in oil and gas and coal companies, with the criteria of companies whose profits have consistently increased for two years due to increases in commodity prices

Funding Type
Coal Production Tax

Estimated potential funding value[99]
US$2.73 billion/year

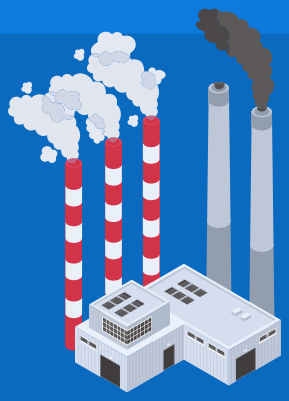
Stakeholders
Ministry of Finance

Challenge

- There is no tax on coal production as an effort to disincentive the extractive sector and governance of coal production, which has a history of oversupply

Recommendation

- Implementation of a coal production tax policy on excess production of the production quota with a minimum rate of 30% of the reference coal price per ton



Funding Type
Carbon Tax

Estimated potential funding value[99]
US$2 billion/year

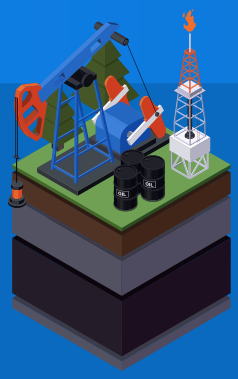
Stakeholders
Ministry of Finance

Challenge

- Delay the implementation of the carbon tax until 2025
- Revise the carbon tax price to IDR 30 (US$ 0.002) per kilogram of carbon dioxide equivalent so that it is very low

Recommendation

- It is necessary to revise the carbon tax rate according to the initial draft or IDR 60-100 (US$ 0.004-0.006) per kilogram of carbon dioxide equivalent
- Accelerate carbon tax implementation plans



Funding Type
Reallocation of Fossil Energy Subsidies

Estimated potential funding value[99]
US$9.64 billion/year

Stakeholders
Ministry of Finance

Challenge

- Fossil energy subsidies are not on target
- Fossil energy subsidies generate negative externality costs in the environmental and health sectors

Recommendation

- The government needs to reallocate inefficient and untargeted fossil energy subsidies to fund renewable energy

Funding Type
Wealth Tax

Estimated potential funding value[99]
US$3.38-9.70 billion/year

Stakeholders
Ministry of Finance

Challenge

- Wealth inequality has not been anticipated and exploited with a potential wealth tax implementation

Recommendation

- Imposition of wealth tax at a progressive rate of 1-2% and on taxpayers with net worth ≥IDR 144 billion (US$ 9 million)

Funding Type
APBD (Reallocation of DBH SDA)

Estimated potential funding value[99]
US$3.8 billion/year

Stakeholders
Ministry of Finance and Regional Government

Challenge

- The government's DBH SDA is still in surplus, realization, and implementation are not always related to anticipating the climate crisis

Recommendation

- Reallocate surplus DBH SDA funds for renewable energy by earmarking for renewable energy fund

Funding Type
International cooperation (JETP etc.)

Estimated potential funding value pendanaan[99]
US$10 billion[100]

Stakeholders
IPG (International Partners Group) or developed countries involved in JETP

Challenge

- Weak bargaining power of the Indonesian government in demanding a larger portion of grants in JETP.

Recommendation

- Opening space for negotiations with IPG regarding the importance of grants to reduce the Indonesian government's debt burden, and encouraging the principles of a just transition with the main point being the democratization of energy at the community level.
- Revise CIPP JETP to include a community-based energy grant component

Funding Type
Debt Swap for Energy Transition

Estimated potential funding value pendanaan[99]
US$30-50.4 billion equivalent IDR 480-806.4 trillion[101]

Stakeholders
Bilateral and multilateral foreign debt creditors

Challenge

- Political courage to open debt renegotiations with developed countries and MDBs.
- Government internal technical readiness (Ministry of Finance, Ministry of Energy and Mineral Resources).
- Mechanism for distributing grant funds and technical assistance (technical assistance) to the community

Recommendation

- EnterDebt Swap for Energy Transition into JETP.
- Indonesia's involvement in Bridgetown Initiative as a forum for renegotiating foreign debt with developed countries.
- Encourage at international level forums both the G20, OECD and COP to open dialogue with creditor countries regarding the scheme for debt swap for the energy transition.
- Do screening towards the communities that are the main targets in the scheme, like debt swap.

100 The grant in CIPP JETP reached US$ 153.8 million.

101 Based on the total bilateral and multilateral loans of the Indonesian government as of November 2023, data source from Bank Indonesia

OPPORTUNITIES AND CHALLENGES
FOR COMMUNITY-BASED RENEWABLE ENERGY
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