ANALYSIS OF CROWDFUNDING AS A COMMUNITY-BASED FINANCING SOURCE FOR RENEWABLE ENERGY IN INDONESIA

Massita Ayu Cindy Putriastuti, Purnomo Yusgiantoro Center, ayu@pycenter.org
Vivi Fitriyanti, Purnomo Yusgiantoro Center, vivi@pycenter.org
Vivid Amalia Khusna, Purnomo Yusgiantoro Center, vivid@pycenter.org
Inka B. Yusgiantoro, Purnomo Yusgiantoro Center, inka@pycenter.org

Overview

The energy sector is the second biggest contributor to greenhouse gas (GHG) emissions after forestry and land use in Indonesia. The government targeted the energy sector to reduce 314.03 million tons of CO2E by 2030 through various programs, including developing renewable energy (RE), which takes the most significant role as it takes 54% of the total emission reduction target. The government aims to reach 23% of renewable energy (RE) on the national energy mix by 2025. Despite the optimistic target, the development of RE was dawdling as the realization of the RE mix only reached 11.7% in 2021. One of the leading causes of the slow growth in Indonesia's RE development is obtaining loans and collecting necessary funds, especially for start-up and small-scale projects. Most developers still rely on conventional financial institutions such as banks to support the projects. At the same time, small projects tend to look for financial support from the government's budget, private CSR (corporate social responsibility) funds, or international donors. Furthermore, there has been a raised concern that small and medium private companies, associations, and cooperatives do not qualify to receive bank loans or be classified as donation recipients.

Crowdfunding (CF) is a new source of finance that allows large groups of people to get involved in various funding activities using internet-based platforms. The main power of CF is the crowd itself and their wisdom as a community rather than counting on a few experts' opinions, which is mainly applied in conventional financial institutions. The rise of the middle class, "*gotong royong*" spirit,[1] and the upcoming environmental issues awareness of millennials and gen Z are several beneficial factors for the crowdfunding market in Indonesia. Unfortunately, this promising potential of CF has not been well-captured by either the Indonesian government or industry players. In addition, no study has been conducted to bring awareness of CF as a new alternative financing option for RE projects for the country.

Thus, this study aims to analyze the feasibilities of Crowdfunding involvement as one of the RE project funding alternatives in Indonesia. This study also includes presenting the survey results to understand people's behavior in investing and donating their money, especially to projects that offer returns, social, and environmental benefits. It will help map the potential of crowdfunding as the alternative financing for RE in Indonesia based on the community perspectives.

Methods

The study was conducted by analyzing the suitability of RE projects' economic criteria such as internal rate return (IRR) and payback period (PP) as well as socio-economic dimension such as the potential backers' demography and environmental issues awareness in Indonesia concerning the four concepts of Crowdfunding (Equity/Securities, Reward, lending (P2P lending), and donation). Primary data was collected through an online survey questionnaire conducted for two months in November–December 2021, with 403 respondents. This study adopted online surveys due to the rapid growth of internet use and mobile communication. Sample size adequacy for multiple regression analysis was applied based on early adopters in Roger's innovation diffusion theory (13.5%) and Slovin's formula. This study's hypothesis testing and descriptive statistics were run using SPSS statistics 26.0. T-test with a single sample was used as the hypothesis test to see if there were statistical differences between the average value of investments and donations and the values obtained from the various groups of survey samples. Descriptive statistics are used to calculate the mean, mode, and frequency of values from survey results.

Results

The RE financial report data collected from various countries between 2010 to 2020 show the IRR (internal rate of return) of RE ranging from minus 8% to plus 32%, with the majority of data fluctuating between 10% and 15%. Meanwhile, the PP (payback period) varied from 6 to 30 years. Higher IRR and shorter PP could usually be found in

[1] Gotong Royong is a spirit of helping each other, so that everyone can optimize their own ability to develop themselves and their social life.

projects on a larger scale. However, numerous other factors are involved, including technology developments, power purchasing price agreements, project locations, interest rates, and applied incentives.

There are four CF schemes offered in this report based on the RE project's IRR, characteristics of CF, and average market interest in Indonesia (Table 1).

Table 1. Four schemes of crowdfunding financing based on the project's IRR.

Project's IRR	Crowdfunding type	Note
IRR > 15%	Securities Crowdfunding	On this level of IRR, it is assumed that RE projects could provide attractive returns to investors. It could mainly be applied to most biomass projects and several hydro, micro-hydro, and solar projects in eastern Indonesia.
IRR >10-15%	Securities + Reward Crowdfunding	This level of IRR is similar to conventional banking cost of funds which nowadays varies from 9% to 15% while they also need to pledge assets to the bank. Securities CF could offer alternative financing to this level, but it still requires attractive returns to attract investors. Thus, hybrid CF, which consists of securities & rewards, could be offered.
IRR >5-10%	Reward + Donation Crowdfunding	IRR below 10% could be categorized as an unsuitable investment, especially for high-risk projects. However, this level of IRR can still provide rewards for funders who give a certain amount of capital as an appreciation. Most RE projects could be found in this level of profitability. It mainly occurred in small-scale projects and projects outside eastern Indonesia.
IRR < 5%	Donation Crowdfunding	This level of IRR merely provides a return or reward for the investors. The profit generated from this project should be used to finance the O&M activities. Most RE projects that fall on this level are biogas, wind, and several solar & micro-hydro projects. Thus, donation CF will be the only alternative for these projects.

Considering the willingness to invest and donate funders, the total accumulated funds could reach around IDR 18–192 trillion (USD 1.2–13.4 billion)/annum for investment and IDR 15–45 trillion (USD 1.1–3.2 billion)/annum for donation. The number could also be optimized if the green projects provide several criteria that attract potential funders as follows: for investment, it should be able to offer ROI 5–8%, PP 6–24 months, and minimize the risk. While for donation, although most respondents do not consider reward as an essential part, it could trigger people to give more than donation projects without rewards. People are also more interested in green projects that directly impact people, such as the health and education sector in 3T areas. So, infrastructure projects such as renewable energy could be integrated with the public sector to attract more contributions from society. It is also interesting to note that the main obstacle in financing the green project is poor financial literacy and the lack of platforms to facilitate public participation where 59% of respondents are willing to invest/donate but have not invested/donated yet. Furthermore, although investment and donation have decreased during the COVID-19 pandemic, it has shifted to the investing paradigm where the investors consider the sustainability factor more.

Conclusions

Indonesia has a vast market potential to implement crowdfunding for green projects. Up to IDR 192 trillion (USD 13.4 billion) can be accumulated through investment and up to IDR 46 trillion (USD 3.2 billion) for donation. Based on this study, three types of CF can be employed as an alternative for RE project funding in Indonesia. Namely, equity/securities, reward, and donation-based CF. In addition, there is also a hybrid model such as the equity-reward and reward-donation CF model. Based on the result, males above 44 years old with higher education (postgraduate) prefer ROI and PP that match with RE projects and crowdfunding. Also, projects that provide the desired ROI of 6-10%, 6 - 24 months of PP, integrated with public sectors such as health and education, and located in 3T areas will be more attractive to investors and donors. Lastly, it is critical to increasing the socialization of crowdfunding as one of the alternative channels for individuals to contribute directly to green projects, particularly among those of working age (Gen X, Y, and Z).