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Indonesian Carbon Market: Hope or Hype?

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Indonesia just inaugurated its carbon exchange (colloquially named IDX Carbon) on 26 September 2023 as the trading platform of Indonesian carbon market. Launched around seven weeks after the Indonesian Financial Service Authority (OJK) released its regulation on Carbon Trading through Carbon Exchange, this inauguration is a long-awaited development in Indonesia's climate change mitigation, given Indonesia's status as one of the top ten emitters in the world.¹

The Indonesian carbon market trades two objects, which are carbon quotas and carbon credits. Under this system, companies in certain regulated industries would have their individual emission capped as total emission in their respective industries is also capped. It should be noted that as of October 2023, only the coal power industry has been regulated in Indonesia. When some companies emit beyond their cap, they must legalize their extra emission by buying unused carbon quotas from those emitting less than their cap.

Additionally, companies outside regulated industries who do green projects can be awarded carbon credits which can be sold in the carbon market. At the same time, as an alternative to buying unused

¹ Based on data from Climate Watch.

carbon quotas, companies in the regulated industries who emit beyond their cap can also buy these credits to legalize their extra emission.

The price of carbon (either carbon quota or carbon credit) would then be determined by carbon market demand and supply interaction. Gradually, market-priced carbon is hoped to become a norm in Indonesia. One thing to note is that for excess emission that is not redeemed by either carbon quotas or carbon credits, it will be carbon-taxed by the government.

Market Inactivity Leading to Possible Non-Optimal Price Discovery

By pricing the previously unpriced carbon, the Indonesian carbon market can expect to maintain better control of Indonesia's emission production. But pricing an object, including carbon, takes a process known as price discovery. Good carbon price discovery requires active carbon transactions (denoted by high trading volume in the carbon market). This frequent exchange or high turnover of carbon quota/credit ownership means that participants are constantly, efficiently, and easily reacting (either by buying or selling the carbon) to every new available piece of information, reflecting a more factual pricing of carbon.

As part of Indonesia's contribution in the global effort to limit the earth's temperature rise by 1.5 degree of Celsius, Indonesia has pledged to achieve Net Zero Emission (NZE) by 2060. This means there is a limit to how much Indonesia can emit until 2060. In other words, Indonesia has little carbon budget left. Carbon price should increase over time to reflect this carbon scarcity. As Indonesian carbon market becomes more active (in discovering the carbon price), the factual price of carbon (that the Indonesian carbon market discovers) should be high (and higher as time goes by).

The faster the carbon price increases, the faster it may get above the clean technology price. As carbon becomes more expensive than clean technology price, people would get disincentivized to continue using carbon-intensive technology. This is a good thing as we can then avoid inflation potentially caused by the constantly increasing carbon price and encourage migration to clean technology as its cost should naturally decrease in the long run.

The problem in the Indonesian carbon market is that the trading volume has been running quite low in the first weeks since the market launch. Inactive market may mean that market participants are still experimenting with price discovery and the market potentially still prices the carbon at a low rate. Although low-priced carbon is still more expensive than the previously unpriced carbon, it might not be enough to deter Indonesia's industrial carbon-intensive behavior.

Thus far, the carbon is priced at around USD 4.5 per ton of CO₂-equivalent in the Indonesian carbon market.² Despite being higher than what the government hopes (at USD 2.0 per ton), this price is still far too low, compared to the European Union's Emissions Trading System (EU ETS) which trades carbon at around USD 87.1 per ton of CO₂-equivalent.³ It is perhaps a long way to go for Indonesian carbon price to hit EU-level price. Market studies estimate that the dynamics of Indonesian carbon market might only price carbon as high as USD 18 per ton at maximum.⁴

Green Projects and Carbon Budget Scarcity

Another problem may also occur because the Indonesian carbon market includes carbon credits sold by green projects, primarily renewable power and forestry, as tradable object in the market.

² Maghiszha, D. F. (2023). *IDX Carbon Catat Transaksi 10 Ton Karbon Senilai Rp 696 Ribu*. Jakarta: IDX Channel.

³ Based on data from Trading Economics.

⁴ Hidiranto, F. (2023). *Jualan Baru Bernama Perdagangan Karbon*. Jakarta: Portal Informasi Indonesia.

Renewable Power Plants

Renewable power plants can be awarded carbon credits. For example, as reported in January 2021, PLN received carbon credits (worth of 1.2 million tons of CO₂-equivalent) from their three Sumatran hydropower power plants (in Musi, Renun, and Sipansihaporas).⁵

These carbon credits can then be sold to emission-intensive companies. This is evident from carbon credits sold by Lahendong geothermal power plant to Pertamina Hulu Energi on the first inaugural day of IDX Carbon.⁶ Knowing that their carbon credits can make money, renewable power plants in Indonesia now would obviously be very attracted to sell their carbon credits.

On the carbon market demand side, this also means that coal power plants in Indonesia can now redeem their excess emission by paying money to renewable power plants. Coal power plants in Indonesia may keep emitting excess emission (beyond their cap) as long as there are always renewable power plants selling carbon credits to them.

Moreover, as Indonesia would want to avoid electricity shortage (especially amidst growing economy and population), the government would likely ensure that renewable power plants grow faster than the phasing down of coal-based electricity. Consequently, the increase in the supply for carbon credits might be higher than the increase in the demand for carbon credits, reducing the market price of carbon credits. This reminds us of carbon price in EU ETS that once got near zero in 2007 due to carbon market oversupply.⁷

What is also odd is that, based on Regulation of Energy Minister Number 39 Year 2017 (amended by Number 12 Year 2018), Indonesian renewable power plants can include those running on municipal waste, biogas, biomass, biofuel, and gasified coal. While this type of transactions between “clean” power plants and coal power plants in Indonesia is considered a solution to Indonesia’s emission problem, the opposite is true and unfortunately legally facilitated.

Forestry Projects

Forest is responsible for so much emission absorption in Indonesia. Forestry projects too can be awarded with carbon credits that can be sold later to the market. For example, Sumatran Merang Peatland Project received carbon credits which were then sold to BMW, Nestle, L’Oreal, Chanel, and Microsoft.⁸

Now, suppose Indonesia’s forest absorbs 450 million tons of CO₂-equivalent in a year and because of this, there are carbon credits (from forestry projects) in Indonesia that is worth the same tons of CO₂-equivalent in a year. And suppose in the same year, Indonesia’s emission-producing sectors emit 900 million tons of CO₂-equivalent. This gives Indonesia net emission of 450 million tons of CO₂-equivalent, which is not an NZE situation.

Hypothetically to achieve NZE situation, if all sectors responsible for emission production in Indonesia are subjects of carbon market, then their emission production must be capped at the amount equal to Indonesia’s emission absorption, because NZE is achieved when emission production is only as much as emission absorption.

⁵ Umah, A. (2021). *PLN Raih Sertifikat Penurunan Emisi Berkas 3 Pembangkit Ini*. Jakarta: CNBC Indonesia.

⁶ Purwanti, T. (2023). *Pertamina Jadi Satu-Satunya Penjual Unit Karbon di IDX Carbon*. Jakarta: CNBC Indonesia.

⁷ Tumiwa, F., Vianda, F., & Swadana, W. A. (2023). *Navigating Indonesia’s Carbon Market*. Jakarta: Institute for Essential Services Reform.

⁸ Crair, B. (2022). *Sumatra Merang Peatland Project*. Geneva: Natural Climate Solutions Alliance.

But non-NZE situation in Indonesia may be permissible. In the above example, the extra 450 million tons of CO₂-equivalent may be redeemed by buying the carbon credits from forestry projects. And the other 450 million tons of CO₂-equivalent is forgiven since they are thought to be under the cap, which equals to the 450 million tons of CO₂-equivalent that Indonesia's forest absorb.

What Ought to be Done?

To facilitate better price discovery for carbon, the government needs to stimulate higher trading willingness in Indonesian carbon market. There must be active big participant(s) in the carbon market which has (financial) power to move the market or signal the move. Small participants in Indonesian market typically need exemplary market figure(s) to follow, which is a kind of herd behavior. This figure could be state-owned institution(s).

Similarly, given that the entry and exit of foreign participants usually drive the financial market dynamics and live up transactions in Indonesia, regulator may need to allow foreign presence in the carbon market. As of October 2023, the regulation for international carbon trading mechanism is still drafted by the Indonesian Ministry of Environment and Forestry. Moreover, carbon tax rate must be higher than carbon's market price, so that emission-intensive companies choose to buy carbon from the market and not choose to be taxed.

Another solution involves making greater efforts to accurately represent the limited amount of carbon that the Indonesia economy can emit. In the spirit of achieving NZE, the government should not let the availability of buyable carbon credits be overwhelmingly abundant (and the price of carbon credits consequently be cheaper) as time goes by. More renewable and forestry projects are undoubtedly a good thing, but the policy to award them with carbon credits should be reevaluated. Carbon credit oversupply may derail the effectiveness of Indonesian carbon market in reducing emission production.

Finally, the government should make the availability of buyable carbon credits scarce as time goes by. Only those who reduce their emissions (such as coal power plants who this year emit less than they did last year) should be rewarded sellable carbon credits. Renewable projects do not reduce their emissions (so they should not be rewarded) since they never emit emissions in the first place. And for forestry projects, they are (primarily) absorbing emission,⁹ which is different from reducing emission¹⁰ (so they should not be rewarded too). Stricter definition of what projects can be awarded sellable carbon credits might be necessary, to avoid over-awarding.

The Road Ahead

Eventually, carbon trading is just one of several ways to control emissions. Transportation system for example, a highly emission-intensive sector, might be more suitable for carbon taxation and not carbon trading. The government would have more control over pricing the carbon through carbon taxation than letting it be determined by the carbon market. And how much carbon is priced deeply matters because that affects people's behaviors over emission, even including their decision on whether to transact in the carbon market or to just let themselves be carbon-taxed in the first place. But despite the importance of carbon tax, the government has twice postponed its implementation so far to 2025.

⁹ Forest also produces emission when it is deforested or burnt. But it is assumed here that forestry project is more about preserving and/or enhancing the emission-absorbing feature of forest.

¹⁰Reducing emission means producing emission that is less than before. For example, a coal power plant produces 1.2 million tons of CO₂e this year, where it produced 1.5 million tons of CO₂e last year. Meanwhile, absorbing emission means sequestering emission from the atmosphere. For example, the same coal power plant does not reduce its emission and still emits 1.5 million tons of CO₂e this year. However, forest absorbs 300,000 tons of CO₂e this year. Therefore, the amount of carbon in the atmosphere is 1.2 million tons of CO₂e this year, with a simplistic assumption that there is only this power plant producing emission in the world.

Not all the story is grim though. As said before, the government is now drafting regulation for international carbon trading in Indonesia. Given that carbon price seems lower in the Indonesian market (compared to other jurisdictions on earth), there might be an arbitrage opportunity. Indonesians may be better off selling carbon quotas or carbon credits to foreigners instead, with a price somewhere above the local price but below the global price. As a result of this outflux of carbon quotas and carbon credits, there might be a low supply of (cheap) carbon quotas and carbon credits to be bought in the Indonesian market, and Indonesian emitters therefore would think twice to emit.

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