

Science and Technology Trends

Greenhouse Gas Reduction and Climate Change

Greenhouse Gas Reduction and Climate Change: Indonesia's Story

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1. Background

Indonesia is one of the countries that are most vulnerable to the negative impacts of climate change. Many global climate change model such as the Global Circulation Model (GCM) have predicted that Indonesia will experience an increase in temperature, intensity of rainfall that will increase the risk of floods and droughts, and extend dry seasons. As an anticipation, the Government has implemented various endeavors to adapt to climate change. This effort for adaptation has been reflected in various sectoral project implementation such as the construction of 65 new dams until 2019, improving our climate and weather monitoring system, climate insurance for farmers and fishermen. These actions are harmonised and operated based on the National Action Plan for Climate Change Adaptation (RAN-API) released in 2014. However, on the other hand, mitigation has started earlier compare to adaptation with more efforts and has received more attention especially from the global community. This paper will be focus more on the mitigation efforts both policies and programs in Indonesia.

Looking back, for Indonesia, hosting COP 13 in Bali in 2007 was a real moment to create momentum in raising awareness of climate change issue and getting people's, and especially government, attention. As it can be seen, a series of interesting experiences and policies took place in the wake of this momentum, such as creation of National Council for climate change (DNPI), Indonesia Climate Change Sectoral Roadmap (ICCSR), Indonesia Climate Change Trust Fund (ICCTF), Presidential Decree for National Mitigation Action Plan (RAN-GRK) and for GHG Inventory, REDD+ Agency and similar unit at local level. However, since the new president, Joko Widodo, took office in 2015, some of those no longer exist: DNPI and REDD+ Agency were dissolved and Ministry of Environment and Forestry (as a result of merger between Ministry of Environment and Ministry of Forestry) took back the role of DNPI and REDD+ Agency.

Since 2008, the Ministry of National Development Planning (Bappenas) started its effort to develop the Indonesia Climate Change Sectoral

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Roadmap (ICCSR) launched in 2010, which means providing inputs for the 5 year Medium-Term Development Plan (RPJM) 2010-2014, and also for the subsequent medium term development plans until 2030. The ICCSR places particular emphasis on the challenges within the forestry, energy, transportation, industry, waste, agriculture, coastal area, water and health sectors. It aims to address these challenges through effective development planning and coordination between the work of all governmental ministries, local governments, private companies and communities. To this end, the climate change sectoral roadmap established a comprehensive framework of mitigation and adaptation actions in Indonesia for the next 20 years (2010-2029).

2. National Mitigation Action Plan (RAN-GRK)

Many believe that the most important reference for current climate change policy in Indonesia is the Copenhagen pledge in the context of the UNFCCC's pre-2020 phase. The country committed to emission reductions by 26% and up to 41% in 2020, depends on the availability of external funding support. The pledge was used as reference for ICCSR and later operationalised through the National Mitigation Action Plan (RAN-GRK) and Local Mitigation Action Plan (RAD-GRK), based on presidential decree number 61 year 2011 (RAN-GRK, 2011). Indonesia's Copenhagen pledge and the RAN/RAD-GRK set a policy-based absolute emission reduction target based on a Business as Usual (BAU) scenario. The original pledge of 26% GHG reduction needed specification, hence, the RAN/RAD-GRK

operationalised the pledge in a well-defined manner. It tied the pledge to the national policy framework and translated the percentage-goal into an absolute amount of targeted GHG reduction (namely 0.767 GtCO₂e.). It broke down the target by sectors and regions, and established a monitoring scheme to evaluate the target.

Since Indonesia has applied a strong decentralization policy, some authority were already delegated to local governments, so for climate change policy to be successfully implemented, the involvement of the local governments became more and more important. Therefore, even though in terms of number ton CO₂ achievement so far from RAD-GRK still far below RAN-GRK (RAN-GRK, 2016), but to make RAN-GRK successful, it needs not only sectoral ministries' support but also local governments', too.

At the highest level, the government has demonstrated willingness to tackle climate change. The Government Indonesia, among the first developing countries that commit to GHG reduction, sought to play a leading role in contributing to a sustainable world economy. Indonesia has been pleased that the Bali roadmap COP 13, has finally achieved the objectives to establish a global agreement, albeit 9 years later in Paris.

During the Paris summit, COP 21, the current President, Joko Widodo committed to a reduction of 29% from Business as Usual (BAU) baseline in 2030, while aiming for 41% in cooperation with our development partners¹. The projected reduction levels will rise to at least 2.88 billion tons of carbon dioxide in 2030². From revised BAU baseline, 29 percent reduction would lower that by 835 million tons CO₂eq. Indonesia make sure that its climate change mitigation target (INDC) is aligned with its National Development Agenda and

1 In 2010, Government of Indonesia through "Jakarta Commitment" prefer to call international organization/foreign countries as "development partner" instead of "donor" to emphasize that the external support should inline with Indonesia's development's objectives.

2 RAN-GRK targets were based on the emission trend at Indonesia Second National Communication while INDC used revised BAU Baseline from RAN-GRK Review process.

Commitment of Government's Medium Term of National Development Planning (RPJMN) 2015-2019 as well the Sustainable Development Goals (SDGs) as agreed at United Nation General Assembly (UNGA) meeting in 2015.

In addition to the National Mitigation Action Plan (RAN-GRK) and RAN/RAD-GRK, the national REDD+ strategy is defined as another crucial programme and mitigation instrument for Indonesia. In 2010, Indonesia and Norway signed a Letter of Intent where Norway pledged to provide a grant for Indonesia in the amount of USD 1 billion for REDD+ program. This fund is to support Indonesia cutting emissions from deforestation and forest degradation activities, has created further stimulus for a more comprehensive legal response towards climate change in forestry sector. Soon after, Indonesia set up REDD+ agency to coordinate this effort. However, despite the country's active legislative response, enforcement and land tenure issues continue to be national main challenges when it comes to deforestation, the country's main source of emissions.

In relation to the function of RAN-GRK, there are several overlaps between the various ongoing mitigation workstreams especially REDD+ since RAN/RAD-GRK talking about landbased sector, including forestry. Therefore, a better synergy is expected to create reliable results between RAN/RAD-GRK and REDD+. After 4 years, it was dissolved, the output of REDD+ agency that is still used until now is the initiative of the one map and one data policy where finally agreed that one institution for the source of official data. For the spatial data, Geospatial Board (BIG) acts as the coordinating body, so all government institution should submit their spatial data to BIG. Then, the map published by BIG will be the official map of Indonesia for all types of land. Then, for

non-spatial data, the statistic bureau will be the center and source of the official data.

In response to the need of landbased sector and an improvement to the tools for monitoring and evaluation of RAN/RAD-GRK, Bappenas has improved the PEP³ system from RAN/RAD-GRK program for monitoring and reporting of RAN-GRK not only about statistical data but also spatial data. Therefore, the location where the activities have taken place is very important information. These data and information will be very important for Indonesia to fulfil its obligation to UNFCCC related to Biannual Update Report (BUR), global stocktakes and related to transparency issues.

The Climate Change Council (DNPI) was formed in 2008 by 17 Ministers and chaired by the President to co-ordinate climate change policies and international positions, including the creation of a cap-and-trade mechanism. The DNPI aimed to increase the effectiveness of coordination between Line-ministries due to the complexity of climate change related issues and cross-sectoral issues. However, this type of ad-hoc team has proven to be not very effective since the implementation depends so much on sectoral ministries and most of the ministers barely had time to attend DNPI meetings. As a result, this new experiment to set up a new institution to create an effective coordination was considered a failure and costly to the country because the expected outputs could not be achieved after 4 years and the country already paid for running of new offices.

While the Ministry of Environment has concentrated on GHG inventory and MRV rules and procedures, the Ministry of National Development Planning (BAPPENAS)⁴ launched the Indonesia Climate Change Trust Fund (ICCTF)

3 PEP: Pemantauan Evaluasi dan Pelaporan, the jargon in Indonesian language used for monitoring and Evaluation for RAN/RAD-GRK.

4 BAPPENAS is always persistent on mainstreaming climate change into development agenda and always see climate change as co-benefit of development programs, not as separate one.

in 2009. The two ministries in the beginning seems working effectively together, but in 2016, Ministry of Environment and Forestry has started some new concept such as a new environment financing institution, a National Registry etc. which need to be seen the synergy with the existing institutions and earlier initiatives by others ministries since there are overlaps in scope and objectives.

The ICCTF aims to exercise direct access scheme from international source of funding and scale up financing by seeking to develop innovative links between international finance and domestic investment. Until today, ICCTF is the only financing institution dedicated solely for climate change in Indonesia. ICCTF continue to work on the institutional development and on the private public partnership approach. Even though, ICCTF has been working on the peatland and community forest, but until now still shy away from REDD+ projects.

3. NAMA Development in Indonesia

Nationally Appropriate Mitigation Action (NAMA) in Indonesia is relatively well accepted since it developed under RAN-GRK framework. NAMA gives clear guidance for developing policies, programmes and activities that could be accepted as mitigation actions. NAMA proposals should show the baseline on how many tons of CO₂ could be avoided, transformational impacts and potential up-scaling. There are almost 20 NAMA proposals being developed since 2009. Out of these 20 proposals, two are registered at UNFCCC secretariat and five proposals have successfully received funding. Therefore, experience of developing NAMAs has provided Indonesia a lot of technical expertise needed to improve the quality of its mitigation policy concept.

For Mitigation Action Plan, both on National

and Local Levels, requires extensive capacity building, since a lot of scientific and technical calculations will be involved. Bappenas has published the technical guidelines for those calculations that could be used for line-ministries and local governments in reporting the results of national and local mitigation action plans. To support all the technical works related to RAN/RAD-GRK, Bappenas set up the RAN-GRK secretariat in 2012 which is assigned as: (1) information hub for all the stakeholders when need information related to mitigation; (2) help-desk for local governments to calculate baseline, result of implementation of mitigation activities, and liaison between stakeholders. Furthermore, Bappenas also provide special support fund for provincial governments (around \$ 100K per province per year) for capacity building activities. At least twice per year, there are capacity building programs conducted for developing the local mitigation action plan and monitoring reports of the implementation. In addition, there are smaller gatherings at province level to learn the technical calculations more intensively. Almost all the provinces have also conducted capacity building for district and city governments, some province governments even put additional budget as co-financing.

Although challenges and possible improvements such as effort on tackling forest fire accident and capacity building on greenhouse gas emissions monitoring and measurement still exist, the first phase of monitoring and evaluation reports for 2010-2013 (RAN-GRK, 2016) showed that mitigation efforts are well under away as also stated at Mid-Term Development (RPJM) 2015-2019 which show Indonesia already achieve around 14% of its 2020 target and use this number as baseline for the RPJM. However, this estimate was made before the big forest fires in 2015.

4. INDC Development Process

While related to 2030 targets, it started with the reviewing process⁵ of RAN-GRK based on the evaluation result of the baseline, sectoral targets and activities proposed to reduce emission, which are also the required data/information for INDC. Therefore, INDC development could go hand-in-hand with the RAN-GRK review. As a result, in INDC development part of RAN-GRK review process, Indonesia already inclusively involve all the stakeholders, especially government institutions. The process was designed in an efficient way using the same team with RAN-GRK and the existing institutional arrangement working with mostly Indonesian experts, leading to credible political decisions (RAN-GRK, 2015), by using existing material without creating an additional burden, and certainty of long-term institutional arrangements that can also be useful for a future implementation phase.

The system dynamic model that developed by the RAN-GRK team (which members coming from line ministries) and supported by modelers from Bandung Institute of Technology (ITB) for INDC (RAN-GRK, 2015) shows that even though forestry sector is still the major source of emission, after 2020 the energy sector will outpace it and become the highest source of emission in Indonesia. This shift should also change the long-term approach to tackle emission reduction in Indonesia. Therefore, Indonesia will start looking for the proper technologies to reduce GHG emission, especially in energy related sectors because the challenges are pretty huge.

In addition, the National Energy Policy (KEN) adopted in 2014 states that Indonesia should “reach” 100% electrification ratio by 2020 and 23% renewable energy in 2025. Meanwhile, the 2015-2019 Medium Term Development Plan (RPJM) puts forward a target electrification ratio

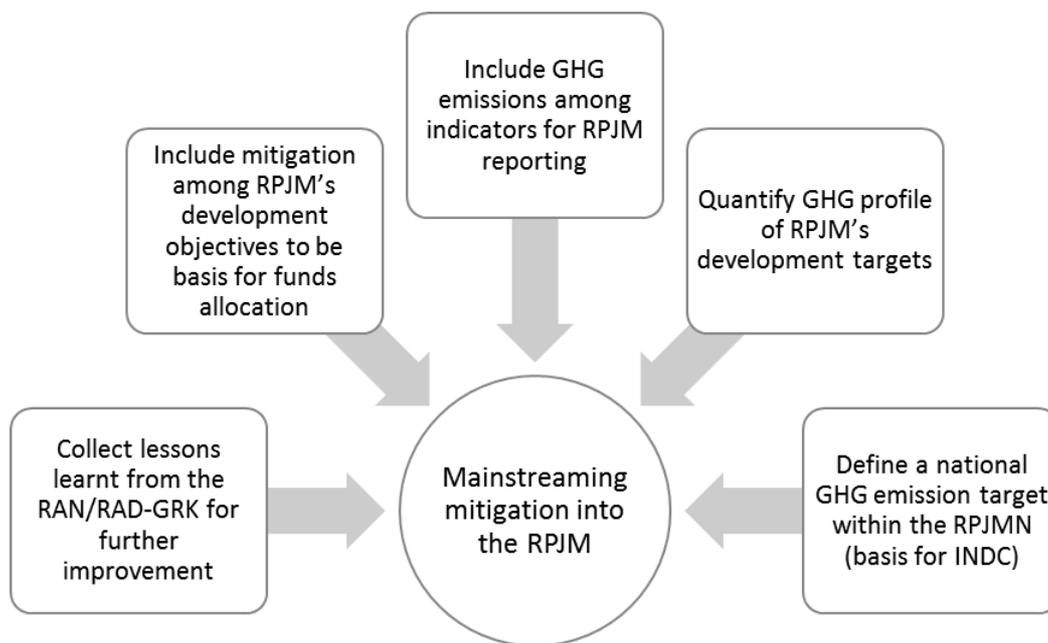
Indonesia’s challenge for electrification program

Being an archipelago nation of some 17.000 islands, spanning more than 5.000 km, by the end of 2014 Indonesia has attained an 84% electrification ratio. In the last 10 years alone, the state utility has managed to connect 20 million new households, or some 78 million people. However, the approaches to electrification that have served so well in the past are increasingly ill-suited to condition Indonesia now faces to connect the remaining 16% of its population, representing some 40 million people. In addition, Indonesia needs to cope with an increasing population and hence an increasing energy demand. Given the socio-economic benefits of electrification, the Indonesian Government plans to continue along this path.

of 96.6% by the end of 2019. All these targets were committed by Indonesia domestically before announcing its commitment to the Paris Agreement. In the other hand, achieving these development targets means also achieving its INDC. As a result, speed up and strengthen implementations of the development programs/activities automatically put Indonesia on ambitious track to achieve its INDC.

After parliament ratifying the Paris Agreement before COP 22 in Marrakesh, 2016, Indonesia submitted the long-term 2030 emission target-known as the Indonesian National Determined Contribution (NDC)—which aims to explain more details on policies, data, information and assumption used to calculate its INDC’s target before. However, this NDC submission even takes times for preparation and but still needs to contain more information for people to understand how Indonesia will achieve the 2030 targets. This leads to remaining homework to accomplish the 2030’s target through sound investment strategies for the implementation of mitigation action plans.

⁵ An approach for building on lessons learned is being developed with the imminent review in 2015 and it remains to be seen to which extent these lessons learned can be basis for prioritizing actions going forward.

Figure 1. Mainstreaming mitigation into the Medium Term Development 2015-2019 (RPJM)

5. Sustainable Development and Climate Change Policy

All these mitigation efforts are put under the umbrella policy of green economy or sustainable development by Bappenas. In the National Medium Term Development Plan for 2015-2019 (RPJMN 2015-2019), the green economy is identified as the foundation of the country's development programme, with the emphasis on "inclusive and sustainable growth, increasing value added of natural resources with the sustainable approach, increasing quality of environment, disaster mitigation and tackling climate change." Therefore, Indonesia will use the SDGs also as an umbrella policy for climate change including NDC.

6. Steps towards Mainstreaming Mitigation into the RPJMN's Development Framework

RAN-GRK already mainstream into RPJM 2015-2019⁶ (RAN-GRK, 2015). The submission process behind the establishment of the RAN/RAD GRK is made for its close alignment with the framework provided by the RPJM (RAN-GRK, 2011). The line ministries and the provinces drew on their existing planning as per the RPJM for designing actions that could be included in the RAN/RAD-GRK. Nonetheless, there is at least anecdotal evidence of how the target achievement in the RAN/RAD GRK exceeds the expectations set by the RPJM—government real spending for climate change 2010-2014 is much higher than

⁶ In addition, the RPJM where climate change is discussed also related to the aims to support the development of green cities; developing rural and remote areas with special attention on border areas, disadvantaged regions, transmigration areas, and small islands; eradicate illegal logging, fishing and mining; improve governance in natural resources and increase community participation in forest management; and increase community resilience to climate change impacts in 15 vulnerable areas defined in the National Adaptation Action Plan on Climate Change (RAN-API).

original plan⁷. Quantifying such achievements would make a good case for how the RAN/RAD GRK leveraged additional action. It is expected that Indonesia will consistently mainstream the (I)NDC into its mid-term development plans until the all the target achieved in 2030 and beyond.

7. What's Next for Indonesia

Donor funding for RAN/RAD-GRK is so far only at a testing phase, mostly only for capacity building activities⁸. Few actions have been developed as so-called supported NAMAs, until now only two get direct support for implementations—SUTRI NAMA and Cement NAMA. But there has not yet been a broad influx of donor funding. Continued improvement of the RAN/RAD-GRK structure might enhance transparent and effective results-based action planning and also contribute to enhancing its attractiveness for donor investments—not only in terms of its individual actions, but also in terms of the RAN/RAD-GRK itself.

The development of the RPJMN 2020-2024 is an opportunity to fully mainstream mitigation objectives related to achievement of NDC targets. From the NAMA process experiences, Indonesia has obtained a lot of technical knowledge and inclusive involvement that contributed during the “INDC readiness phase” from 2015 until 2019 and beyond. This would involve mitigation among the development key objectives, ultimately to be a criterion for funds allocation.

Related to this, indicators for RPJMN reporting would need to take on GHG emissions. This could be operationalised through using modelling approach that would quantify the RPJMN's development targets in terms of their GHG emissions. Such a quantification of GHG implications of the national development targets would also be the best basis

in defining a national GHG emissions target—and, related to this, an (I)NDC for Indonesia.

Even though, domestic funding will be the main source of funding, but certainly Indonesia still need support from international sources to extend its efforts to mitigate and adapt to the negative of climate change. Therefore, still in Indonesia's agenda to pursue further to strengthen the current financing mechanism established under the UNFCCC such Green Climate Fund (GCF) and immediately realizing the commitment of developed countries through climate finance schemes.

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⁷ Climate Financing in Indonesia, Bappenas, 2014

⁸ Climate Change Funding, Bappenas, 2014