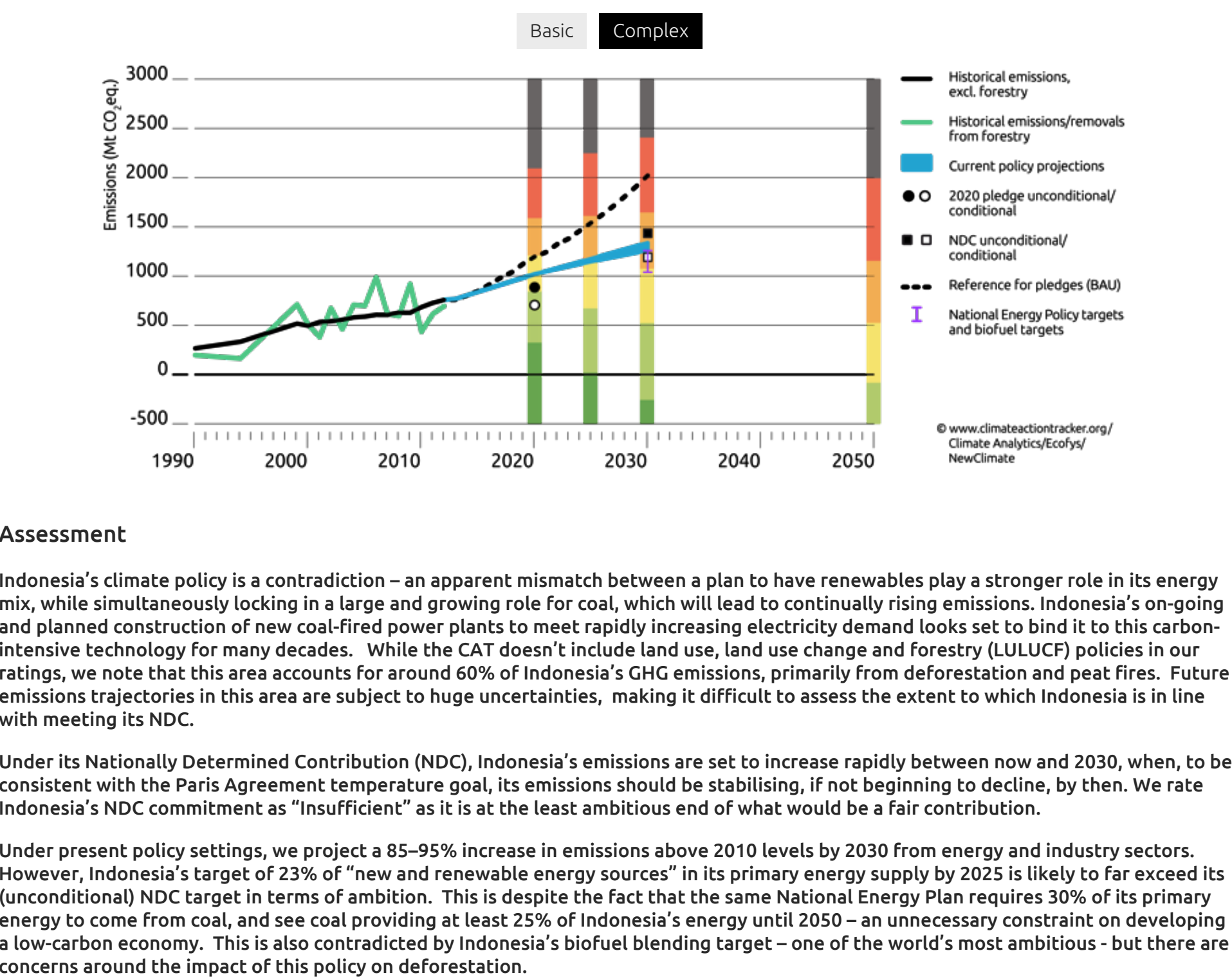




Rating



Assessment

Indonesia's climate policy is a contradiction – an apparent mismatch between a plan to have renewables play a stronger role in its energy mix, while simultaneously locking in a large and growing role for coal, which will lead to continually rising emissions. Indonesia's on-going and planned construction of new coal-fired power plants to meet rapidly increasing electricity demand looks set to bind it to this carbon-intensive technology for many decades. While the CAT doesn't include land use, land use change and forestry (LULUCF) policies in our ratings, we note that this area accounts for around 60% of Indonesia's GHG emissions, primarily from deforestation and peat fires. Future emissions trajectories in this area are subject to huge uncertainties, making it difficult to assess the extent to which Indonesia is in line with meeting its NDC.

Under its Nationally Determined Contribution (NDC), Indonesia's emissions are set to increase rapidly between now and 2030, when, to be consistent with the Paris Agreement temperature goal, its emissions should be stabilising, if not beginning to decline, by then. We rate Indonesia's NDC commitment as "Insufficient" as it is at the least ambitious end of what would be a fair contribution.

Under present policy settings, we project a 85–95% increase in emissions above 2010 levels by 2030 from energy and industry sectors. However, Indonesia's target of 23% of "new and renewable energy sources" in its primary energy supply by 2025 is likely to far exceed its (unconditional) NDC target in terms of ambition. This is despite the fact that the same National Energy Plan requires 30% of its primary energy to come from coal, and see coal providing at least 25% of Indonesia's energy until 2050 – an unnecessary constraint on developing a low-carbon economy. This is also contradicted by Indonesia's biofuel blending target – one of the world's most ambitious - but there are concerns around the impact of this policy on deforestation.

Indonesia's NDC could be easily strengthened by explicitly including the envisioned share of renewable energy.

Indonesia's Nationally Determined Contribution (NDC) released in November 2016 includes an unconditional 2030 GHG emissions reduction target of 29% below business-as-usual (BAU) and a conditional 41% reduction below BAU by 2030 (with sufficient international support). Indonesia had earlier already pledged a 26% reduction below BAU by 2020. These targets apply to emissions from energy and industry as well as to emissions from deforestation and peat land destruction. The latter accounts for the largest source of Indonesia's emissions, an average of 60% of total emissions over the last ten years (based on the national inventory).

The CAT rates countries based on their emissions profiles excluding LULUCF. With currently implemented policies, Indonesia will probably achieve its unconditional 2030 pledge (29% below BAU) as far as non-LULUCF emissions are concerned, and may be very close to meeting its conditional target as well. However, there are concerns about this BAU being inflated, meaning the NDC would still be consistent with a substantial emissions growth.

Pledges and targets

Indonesia's NDC includes a unilateral reduction target of 29% below BAU emissions of GHG, including LULUCF, by 2030, plus a conditional 41% reduction target with sufficient international support. Indonesia ratified the Paris Agreement in late October 2016, reiterating the pledge of 29% reduction below BAU of its INDC.

In evaluating the Indonesian NDC, we have assumed the reductions below BAU are applied equally to GHG emissions excluding LULUCF, and LULUCF emissions, as implied by the First Biennial Update Report. In that case, under the unconditional NDC, emissions excl. LULUCF in Indonesia could increase by roughly two-thirds from 2020 to 2030. Alternative assumptions on the role of the LULUCF sector in achieving the 2030 target would lead to very different levels of energy and industry-related emissions in 2030, given the importance of the LULUCF sector in Indonesia's total emissions.

The Indonesian NDC reiterates the target shares of coal, oil, gas and "new and renewable energy" in TPES until 2050 given by the National Energy Policy —"Government Regulation No. 79/2014 on National Energy Policy, set out the ambition to transform, by 2025 and 2050, the primary energy supply mix with shares as follows (...)—" **it is unclear whether these NEP targets are part of Indonesia's NDC commitment.** The current shares of energy carriers in TPES are shown in the table below (ADB, 2016) along with the target shares according to the National Energy Policy.

TPES	Current level	Targets	
	2011	2025	2050
Coal	26%	30%	25%
Oil	50%	25%	20%
Gas	20%	22%	24%
RE (excl. trad. biomass)	4%	23%	31%

The NDC BAU allows for substantial emissions growth: according to Indonesia's official BAU from the National Action Plan on Greenhouse Gases Emission Reduction (BAPPENAS, 2015), mentioned in the original INDC submission, the country's emissions level, incl. LULUCF, is expected to increase from 1,805 MtCO₂e/year in 2020 to 2,885 MtCO₂e/year in 2030. From these BAU values, it follows that Indonesia's pledge corresponds to absolute emission levels of 1,335 MtCO₂e/year unconditionally by 2020, 2,050 MtCO₂e/year unconditionally by 2030, and 1,700 MtCO₂e/year conditionally by 2030. (These values have been somewhat adjusted in the 2016 NDC submission, where under BAU, emissions would rise to 2,869 MtCO₂e/year in 2030 incl. LULUCF and 2,155 MtCO₂e/year excl. LULUCF.)

If emissions excluding LULUCF were allowed to reach BAU levels in 2030, we would give Indonesia's NDC a rating of "Highly Insufficient."

Our current policy assessment (see below) shows that Indonesia is likely to be very close to achieving its conditional 2030 target. This raises the question of what the "BAU" scenario is really based on, as it is nearly a gigatonne higher in 2030 than the CAT's current policy assessment. It appears that this may be a case of "BAU inflation," which means the target (up to 41% reduction) may sound ambitious, but actually is relatively straightforward to achieve, given current policy developments.

The NEP targets may be more ambitious than the NDC suggests: our projections do not presume that the 23% RE target will be met under current policies (see also "Assumptions"). The basic composition of TPES in our scenario is based on the projections by (APERC, 2016). While policies are in place to increase the share of renewables (e.g. a biofuel blending mandate, and a feed-in tariff), the projections by (APERC, 2016) do not foresee these targets to be reached as of yet. However, we have quantified the potential effect of their achievement in addition to the BAU-based NDC commitment. This results in emissions of 1,040–1,260 MtCO₂e/year in 2030, substantially below the NDC's "29% below BAU" pledge.

This would result in a stronger target than the conditional 2030 pledge, and could move Indonesia's NDC to a range straddling the lower end of the "Insufficient" rating and the higher end of the "2°C compatible" rating.

However, due to the continuing role of coal in Indonesia's energy mix foreseen by the ESP, this is likely to no longer hold by 2050: by then, 2°C compatibility could only be reached by emissions levels of less than 430 MtCO₂e/year, meaning emissions would have to peak in the period 2025–2050. This is highly doubtful if the share of coal in TPES is to only decrease by 5% in that timeframe—especially given that overall energy demand is still projected to increase by a factor of roughly 2.5 between 2025 and 2050 (ADB, 2016). Thus, the NEP targets are close to a "2°C compatibility" rating in the short term, but most likely would be rated at best "Insufficient" in the long term.

2020 pledge

In September 2009, the Indonesian government proposed to cut emissions (incl. LULUCF) by 26% by 2020 from BAU levels and submitted it to the Copenhagen Accord on 30 January 2010. In April 2011, Indonesia clarified that, in addition to its unilateral 26% target, it proposed a 41% reduction below BAU target conditional on international support for Nationally Appropriate Mitigation Actions (NAMAs). This was again confirmed in the First Biennial Update Report (Republic of Indonesia, 2016a).

Fair share

We rate Indonesia's NDC "Insufficient." Assuming that emissions reductions would be shared equally between LULUCF and other emission sources, the conditional NDC would be on the border between the "Insufficient" and the "2°C Compatible" rating.

The "Insufficient" rating indicates that Indonesia's climate commitment in 2030 is not consistent with holding warming to below 2°C, let alone limiting it to 1.5°C as required under the Paris Agreement, and is instead consistent with warming between 2°C and 3°C. If all countries were to follow Indonesia's approach, warming would reach over 2°C and up to 3°C. This means Indonesia's climate commitment is at the least stringent end of what would be a fair share of global effort, and is not consistent with the [Paris Agreement's 1.5°C limit](#), unless other countries make much deeper reductions and comparably greater effort.

The CAT ratings are based on climate commitments in (I)JNDCs. If the CAT were to rate Indonesia's projected emissions levels in 2030 under current policies, Indonesia would fall on the border between the "Insufficient" and the "2°C Compatible" rating.

The "2°C Compatible" would indicate that Indonesia's climate policies in 2030 are within the range of what is considered to be a fair share of global effort but are not consistent with the Paris Agreement. This approach requires other countries to make deeper reductions and comparably greater effort to limit warming to 1.5°C.

For further information about the risks and impacts associated with the temperature levels of each of the categories [click here](#).

Current policy projections

In 2030, under the CAT current policies scenario, GHG emissions excl. LULUCF will increase to 1,260-1,340 MtCO₂e/year, about four times the 1990 levels, and 70% higher than 2012 emissions. These projections are close to the conditional NDC target.

Our current policy projections take into account an increase of electricity demand due to increasing economic growth and electrification, which the National Energy Policy is targeting at 100% by 2020 (from current levels of 85%) and an increase in total primary energy demand, with coal and gas also strongly increasing. Planned capacity additions are also included in our current policy scenario.

Energy supply: high probability of fossil fuel lock-in

Indonesia's NDC reflects the targets of the National Energy Policy (NEP) to increase renewable energy to 23% of total primary energy supply (TPES) by 2025, from today's share of 4% (ADB, 2016). The target was originally anchored in the NEP in 2014 and is supported by a feed-in tariff (CDKN, 2014). Indonesia also has one of the most ambitious biofuel blending mandates in the world (ICCT, 2016), however there are issues around the impact on deforestation (see below under transport, agriculture). However, the NEP also foresees the share of coal to be 30% by 2025 and 25% by 2050, and Indonesia is also working on the construction of new coal-fired power plants to meet rapidly increasing electricity demand (Enerdata, 2015), a development likely to bind the country to this carbon-intensive technology for many decades. Various other sources also predict that coal will keep playing a major role in Indonesia's energy mix in the foreseeable future, i.e. (APERC, 2016).

Since our current policy projections do not assume that the NEP targets will be met, the assumed role of coal in our projections is even stronger than what it would be under the lock-in envisaged under the NEP. The Electricity Supply Business Plan 2016–2025 sets out a target of 80.5 GW of new capacity over the next 10 years, of which 5 GW is from solar, 11.1 GW from geothermal, and 14.6 GW from hydropower (sum of allocated plus unallocated capacity), but also 25 GW from coal-fired power plants. An installed capacity of 25 GW of coal-fired power plants will emit roughly 200 MtCO₂e/a. Unless the coal plants are decommissioned before the end of their lifetime, they will continue to emit this amount over the next 50 years. The plan also indicates that if renewable capacity additions were to fall short of the target, gas may be used instead, as a "Plan B" (Global Business Guide Indonesia, 2016; Republic of Indonesia, 2016c).

These developments in energy policy represent an apparent mismatch in the context of climate policy with, on the one hand, renewables being pushed to play a stronger role in the energy mix, but, on the other hand, locking in the role of coal. While achieving the targets of the NEP (which we do not assume to happen under current policies) would result in emission reductions as compared to keeping the current fuel split, it is to be noted that under current plans the roles of especially coal, but also oil and gas, would remain locked in across the coming decades, making a deep reduction of emissions extremely difficult and very costly.

Transport and industry

Indonesia's biofuel blending mandate is one of the most ambitious in the world. The National Energy Policy under Presidential Regulation No. 5/2006 initially pronounced the aim of having a 5% share of biofuels (ethanol and biodiesel) in national energy consumption by 2025. Since 2008, regulations by the Ministry of Energy and Mineral Resources (MEMR) have further adapted and specified biofuel targets to a sector level. However, there are issues around the biofuel targets relating to palm oil (see below under Agriculture).

According to Ministerial Regulation No. 12/2015, a 30% biofuel blending is to be achieved for transportation, industry, and electricity production by 2020 and 2025 (ICCT, 2016).

Agriculture

The demand for biofuels will have impacts for the agricultural sector, as this demand may be met by expansion of the domestic palm oil industries. While oil palm plantations in Indonesia are required to be ISPO-certified (Indonesian Sustainable Palm Oil), plantations for biofuel production are specifically exempt from this. As the total area of palm oil plantations in Indonesia has risen more than tenfold in the period 1990–2015 (US Department of Agriculture, 2016), while forest cover declined by about 20% (World Bank, 2015), production of biofuels from palm oil is "predicated on a vision of biofuel expansion that would require extensive deforestation," according to the ICCT (ICCT, 2016). Options to prevent this could be requiring incentivising the creation of new palm oil plantations only on degraded lands, or support biofuel production from oil palm residues (ICCT, 2016).

LULUCF: Substantial role for deforestation

Indonesia's deforestation already contributes to a large share of global deforestation emissions: taking into account the uncertainties in global values (van der Werf et al., 2009), in some years over the last decade, Indonesia's emissions from deforestation (according to the BUR1) could have been up to 40% of the global total. Assessing a LULUCF emissions trajectory is somewhat complicated by the fact that these emissions have shown large fluctuations due, among other things, to the variability of emissions from peat fires to external factors such as the influence by El Niño.

Separate assessments of Indonesia's LULUCF emissions were made in the [2015](#) and [2016](#) assessments for Indonesia. LULUCF emissions may be a huge uncertainty factor in assessing the extent to which Indonesia is in line with meeting its NDC, despite the fact that the CAT does not assess the LULUCF component of the NDC.

Assumptions

Historical data

We use the historical data provided by the First Biennial Update Report for the period 2000–2012, and data reported to the UNFCCC for the period before 2000 (note that there is a small discrepancy, of about 50 MtCO₂e, between UNFCCC and BUR data for the year 2000; we have made no attempt to harmonise these data sources as the discrepancy is small). The BAU (both excluding and including LULUCF) scenario for Indonesia, which runs until 2030, is taken from the National Center of National Action Plan for Greenhouse Gas reduction, which falls under the Ministry of National Development Planning (BAPPENAS).

Pledge

As the BAU emissions levels in 2030 are extremely close to those in the NDC, we assume that the pledge in Indonesia's NDC is based on the BAU. We note here that the First Biennial Update Report makes a reference to what seems to be a different BAU with even higher emissions. Without resolving this issue of conflicting baseline scenarios, we use the BAU referenced in the original INDC in our assessment, in order to be consistent with that document.

The emission levels corresponding to reaching the NDC commitments are calculated as the relevant percentages below the BAU. These percentages apply to overall emissions (i.e. incl. LULUCF) according to the NDC, but the first Biennial Update Report (Republic of Indonesia, 2016a) shows the 2020 target being applied in equal measure to each different sector. Thus, we assume it applies proportionally also to emissions excl. LULUCF.

The AFOLU emissions in the Government's BAU are aggregated from various components: agriculture, land use change excluding peat, peat decomposition, and peat fires. The main reason for the many fluctuations in these emissions is because the BAU implies that the emissions from peat fires will follow an oscillating trajectory (varying between roughly 150 MtCO₂e/year and 400 MtCO₂e/year), probably as a consequence of the assumption that peat fire emissions are influenced strongly by the El Niño cycle.

Current policy projections

We construct the range of current policy projections based on different assumptions of what might happen to the coal-heavy power sector in Indonesia in the future. The scenarios are based on the BAU scenario from APERC, which "assumes current policies and trends continue" (APERC, 2016). According to this BAU, the share of coal in power generation will increase from 51% in 2013 to 58% in 2020 and 60% in 2030. Using emission factors from the IEA's Current Policy Scenario for non-OECD Asia, multiplied by the time series of coal, oil and gas in TPES according to this BAU, gives an upper bound of emissions in our Current Policy Scenario for the energy sector, representing continued use of coal. Note that this scenario is consistent with increasing installed capacity of coal by 25 GW between 2013 and 2025.

A lower bound for the Current Policy Scenario is constructed by looking at the projections of fuel mix according to Indonesia's Electricity Supply Plan (ESP) (Republic of Indonesia, 2016c), which foresees a stronger shift from coal to gas in the power sector, in accordance with the National Energy Policy. In the ESP projections, coal will reach a share of around 60% by 2020 in power production, but afterwards drop back down to 50% by 2025, with gas, and to a smaller degree hydropower and geothermal power, making up the difference. We extrapolate this development until 2030 in a linear fashion, and use this new fuel mix in the power sector, along with projections of overall power demand from APERC, to construct the lower bound of our Current Policy Scenario, representing a shift from coal to gas.

We note that the total electricity demand forecast by the ESP by 2025 is substantially higher than that in APERC's BAU scenario—528 TWh in the former vs. 383 TWh in the latter—implying rather diverging assumptions on the rate of electrification and/or the growth in energy demand between the two sources. This is to be expected, as the APERC scenario is a current policy scenario, whereas the ESP scenario presumably incorporates more planned policy considerations.

It is to be noted that in our current policy scenario, the target of 23% renewables in TPES is not reached.

We subsequently harmonise the resulting time series of energy-related CO₂ emissions to historical data from the first Biennial Update Report, and add process emission projections from the 2nd National Communication (Ministry of Environment, 2010) and non-CO₂ emission (from agriculture and waste) projections from the US EPA (US EPA, 2012). Finally, we again harmonise the resulting time series to the historical data series on overall emissions excl. LULUCF from the first Biennial Update Report, to construct an overall reference level for emissions excluding LULUCF.

Renewable energy and biofuel targets

A third scenario—representing the achievement of Indonesia's target shares in primary energy supply by 2025, as per the National Energy Policy (including 23% RE excl. traditional biomass), and the achievement of a 30% blending of biofuels in transport and industry by 2025 (assuming that this reduces the demand for other liquid fuels) (ICCT, 2016)—is constructed using the APERC projections of total supply and demand as a baseline and adapting the relevant shares of renewables and biofuels in the future.

It is assumed here that the share of renewables in TPES will develop linearly from 2025 and 2050 between the targets for those years; it is assumed that the biofuel blending mandate stays at its 2025 level for 2030. The upper bound of this scenario assumes that the biofuel blending mandate overlaps completely with the goal of reaching 23% RE in TPES and that the share of traditional biofuels in TPES would decrease with the same rate as that projected for all biofuels in Indonesia in (WEQ, 2013); the lower bound is based on the assumption that these targets are completely additional to one another, and that the share of traditional biofuels in TPES would stay at its current levels (31%, estimated by combining data from (APERC, 2016) and (Republic of Indonesia, 2016c)).

This scenario is shown additionally to the range of current policy scenarios and the pledges based on the NDC's BAU. Despite the continuing importance of coal in this scenario, it does result in substantially lower emissions than the current policy scenario and, would lead to Indonesia overachieving its conditional 2030 NDC target. If Indonesia's 23% RE target were to be interpreted as being part of its NDC commitment, as it is explicitly mentioned earlier, the rating of its NDC target would shift to the border between "insufficient" and "2°C compatible" for 2030. As mentioned earlier, it is highly unlikely this would still hold by 2050 due to the continuing role allotted to coal according to the ESP.

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