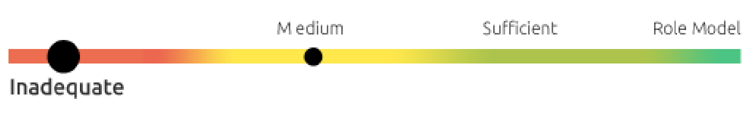
CLIMATE ACTION TRACKER

Indonesia

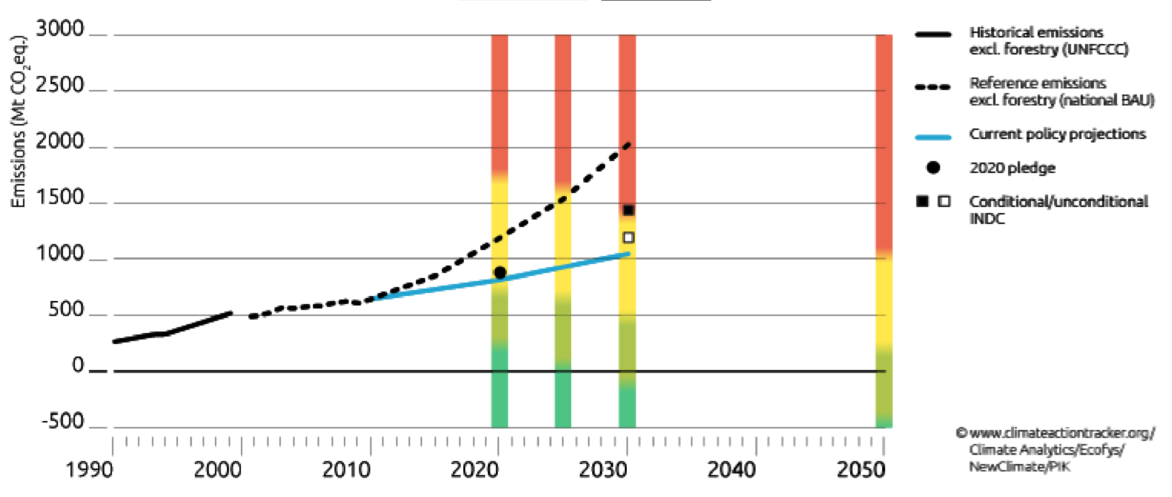
History: 2017 2016 2015 2014 2013 2012 2011

Page last updated: 21st October 2015

Rating



Basic view | +Pledge



Note: Hover over the coloured bars for a pop-up with the fair emissions range per effort sharing category. More information here.

Assessment

Indonesia's Intended Nationally Determined Contribution (INDC), released on 24 September 2015, includes an unconditional 2030 GHG emissions reduction target (including land-use, land-use change and forestry (LULUCF)- emissions) of 29% below business-as-usual (BAU) and a conditional 41% reduction below BAU by 2030 (with sufficient international support).

We rate the INDC **''inadequate''**. Under different assumptions as to what fraction of effort is devoted to deforestation, the INDC could be rated either ''medium'' or ''inadequate". Current policies for GHG emissions excluding LULUCF are in the ''medium'' range for 2030, however our estimate of the INDC implications for emissions lie **above** current policy levels, with the unconditional INDCs in the ''inadequate" range.

Indonesia would need to quantitatively clarify how it intends to reduce emissions across the different sectors to permit a revision of our ''inadequate'' assessment. The INDC does not elaborate as to which sectors Indonesia intends to reduce emissions to achieve its targets. We thus had to make assumptions as to which level of action comes from deforestation, so as to be able to estimate the implications for greenhouse gas emissions excluding deforestation (see "Fair Share" section for further detail).

Indonesia's INDC targets include deforestation emissions due to deforestation and peatland destruction, which at present account for the largest source of the country's emissions, an average of 60% of total emissions over the last ten years (based on national data). The effect of the INDC on future deforestation emissions is not made clear in Indonesia's submission.

Indonesia is the only main deforestation emitter globally where a continuation of the trends of the last decades from independent estimates would result in a potentially very strong increase from deforestation emissions in the period to 2030. A continuation of present trends would cause a loss of 25% of the current forest area by 2030, driving increasing emissions. Indonesia's deforestation already contributes to a large share of global deforestation emissions: around 30--40% for the period 2000-2010. [1]

With currently implemented policies Indonesia will likely overachieve its 2020 pledge (26% below BAU).

Major issues with deforestation data and emissions

While the Indonesian Government's data shows relatively stable deforestation emissions for the last decade, independent scientific sources indicate a strong increase in deforestation over the same time period. This has happened despite the fact that Indonesia has, temporarily, (2010–2016), prohibited the clearing of primary forest and the conversion of peat lands.

While the Government BAU projections for the future show emissions from deforestation as constant - or slightly decreasing over time - this does not appear to reflect the reality on the ground at present, which points towards increasing deforestation. We find that extrapolating the trend of forest cover loss from one recent study which shows a 20% increase in deforestation annually between 2001 and 2012, results in projected emission levels of above 1.7 $GtCO_2$/year from LULUCF by 2030, roughly twice as high as all emissions in the sector under the Indonesian Government's BAU. A draft version of Indonesia's INDC indicated plans to protect 12.7 million hectares of forest areas by designating it to social forestry, ecosystem restoration, conservation and sustainable use (Government of Indonesia 2015). The final INDC no longer mentions these plans.

Construction of new coal fired power plants risks lock-in of high emissions

One important implemented policy is Indonesia's ambition to increase renewable energy to 23% of primary energy supply (excluding the traditional use of biomass) by 2025, from a share of 6% (Ministry of Environment 2010, ESDM 2014). This target was anchored in the National Energy Policy in 2014 and is supported by a feed-in tariff. However, Indonesia is also working on the construction of new coal-fired power plants to meet rapidly increasing electricity demand (Enerdata 2015) a development which is likely to bind the country to this carbon-intensive technology for many decades.

Pledges and post-2020 INDC

INDC – post 2020

Convention	
Copenhagen pledge	26% below BAU by 2020 (unconditional) incl. LULUCF [330% relative to 1990 excl. LULUCF]
INDC	
2020 target	26% below BAU by 2020 (unconditional) incl. LULUCF [330% relative to 1990 excl. LULUCF]
2030 target	29% below BAU by 2030 (unconditional) incl. LULUCF 41% below BAU by 2020 (conditional) incl. LULUCF [450%/540% relative to 1990)
Conditions	Support from international cooperation
Coverage	Energy, Industry, Agriculture, LULUCF, Waste, maritime emissions ''important in 2020 and beyond''

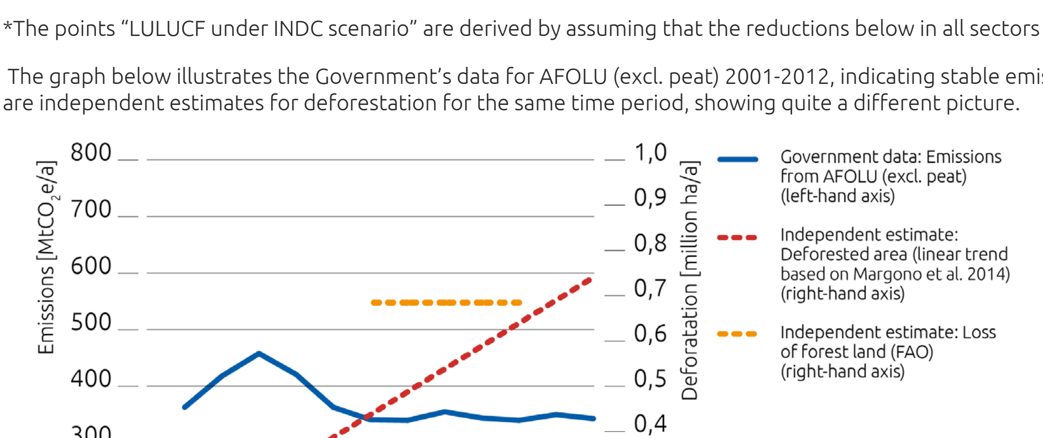
Indonesia's INDC, submitted to the UNFCCC on 24th September 2015, includes a unilateral

The pledge applies to emissions including LULUCF. The LULUCF sector contributes with an average of 60% of total emissions over the last ten years based on national data. Independent estimates indicate that LULUCF emissions could be significantly higher. By 2030, in the Indonesian Government's official BAU case, emissions from LULUCF are about one third of GHG emissions.reduction target of 29% below BAU emissions of GHG including LULUCF by 2030, plus a conditional 41% reduction target with sufficient international support (along with the previously communicated target to reduce emissions in 2020 by 26% below BAU unilaterally).

According to Indonesia's official BAU from the National Action Plan on Greenhouse Gases Emission Reduction (Sekretariat RAN-GRK n.d.), also mentioned in the INDC submission, the country's emissions level (including LULUCF) is expected to increase from 1,805 $MtCO_2e$/year in 2020 to 2,881 $MtCO_2e$/year in 2030. From these BAU values, it follows that Indonesia's pledge corresponds to absolute emission levels of 1,336 $MtCO_2$/year unconditionally by 2020, 2,046 $MtCO_2e$/year unconditionally by 2030, and 1,700 $MtCO_2e$/year conditionally by 2030.

In official business as usual projections, emissions from land-use, land-use change and forestry are expected to vary between roughly 600 and 900 $MtCO_2e$/year from 2020 to 2030, at similar levels to those reported in official government documents for the period 2000 and 2012. However, it must be noted that independent scientific estimates of deforestation rates and trends, and consequent CO_2 emissions differ significantly from government numbers. In particular a strong increasing trend in deforestation shown during the period 2001 to 2012 contradicts government data, as illustrated in the following graphs (see also section on current policies).

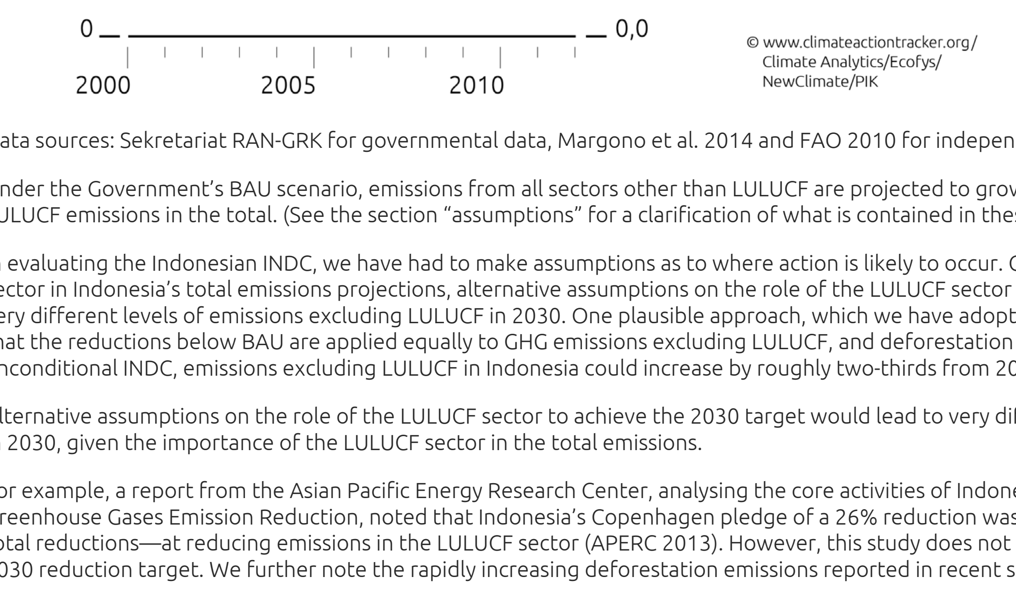
This graph shows Indonesia's national data for historic emissions and BAU scenario, where emissions from LULUCF since 2000 suddenly move within a stable range. The Government's BAU projects them to continue like this until 2030. The zig-zag behaviour results from the assumptions on emissions from peatlands



Data sources: UNFCCC data query up to 2000, and Sekretariat RAN-GRK from 2001 to 2030

*The points "LULUCF under INDC scenario" are derived by assuming that the reductions below in all sectors are equal (29%/41%).

The graph below illustrates the Government's data for AFOLU (excl. peat) 2001-2012, indicating stable emissions in recent years. Alongside that are independent estimates for deforestation for the same time period, showing quite a different picture.



Data sources: Sekretariat RAN-GRK for governmental data, Margono et al. 2014 and FAO 2010 for independent estimates

Under the Government's BAU scenario, emissions from all sectors other than LULUCF are projected to grow rapidly, decreasing the share of LULUCF emissions in the total. (See the section "assumptions" for a clarification of what is contained in these BAU values.)

In evaluating the Indonesian INDC, we have had to make assumptions as to where action is likely to occur. Given the importance of the LULUCF sector in Indonesia's total emissions projections, alternative assumptions on the role of the LULUCF sector to achieve the 2030 target lead to very different levels of emissions excluding LULUCF in 2030. One plausible approach, which we have adopted for the figures shown, is to assume that the reductions below BAU are applied equally to GHG emissions excluding LULUCF, and deforestation emissions. In that case, and under the unconditional INDC, emissions excluding LULUCF in Indonesia could increase by roughly two-thirds from 2020 to 2030.

Alternative assumptions on the role of the LULUCF sector to achieve the 2030 target would lead to very different levels of industrial emissions in 2030, given the importance of the LULUCF sector in the total emissions.

For example, a report from the Asian Pacific Energy Research Center, analysing the core activities of Indonesia's National Action Plan on Greenhouse Gases Emission Reduction, noted that Indonesia's Copenhagen pledge of a 26% reduction was chiefly aimed—up to roughly 90% of total reductions—at reducing emissions in the LULUCF sector (APERC 2013). However, this study does not provide any analysis concerning the 2030 reduction target. We further note the rapidly increasing deforestation emissions reported in recent scientific publications.

Since the INDC does not specify how the emission reduction target should be divided across different sectors, it would be a theoretical possibility for Indonesia to achieve all reductions solely from the LULUCF sector.

If emissions excl. LULUCF would be allowed to reach BAU levels in 2030, the pledge would receive an "inadequate" rating; if they were to follow the current policy scenario, the pledge would be rated "medium", because this scenario, by 2030, is already more ambitious than the INDC.

2020 pledge

In September 2009 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. A large proportion of these reductions would come from reducing deforestation. 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). However, in Indonesia's INDC, there is no more mention of this 41% as a 2020 pledge. The INDC only reiterates the unconditional 2020 pledge.

Fair share

We rated Indonesia's INDC "inadequate" due to the extremely large uncertainty in the intended reduction in the level of industrial emissions, a consequence of the profound lack of information on how much of the emission reductions would occur in the LULUCF sector, as well as the great uncertainty of the emissions data for that sector.

Assuming that emission reductions would be equally shared between LULUCF and other emission sources, the unconditional INDC would be on the edge between the ''medium'' and the "inadequate" rating, and would be roughly in line with effort sharing approaches that focus on convergence to equal per capita emissions and equal accumulated per capita emissions. Approaches that focus on responsibility, capability and costs would require more stringent reductions. If, it is assumed that the largest part of the reductions in the INDC were to come from substantially reduced deforestation, then the INDC would result in higher levels of emissions excluding LULUCF, significantly above the threshold for the "medium" rating. The conditional INDC is lower and would result clearly in the "medium" rating if turned into an unconditional target.

The "inadequate" rating indicates that Indonesia's commitment is not in line with interpretations of a "fair" approach to reach a 2°C pathway. This means it is not consistent with limiting warming to below 2°C. The rating "medium" would mean that Indonesia's climate plans are at the least ambitious end of what would be a fair contribution. This means it would still not be consistent with limiting warming to below 2°C unless other countries make much deeper reductions and comparably greater effort.

Current policy projections

In 2030, GHG emissions excl. LULUCF will increase to 1,048 $MtCO_2e$ under the current policies scenario. This is about 4 times the levels of 1990, and 60% higher than emissions in 2010. If it is assumed that both LULUCF and non-LULUCF emissions were to be reduced by 29% below BAU, the emissions excl. LULUCF resulting from the unconditional INDC target would be slightly above the CAT estimate of current policy projections by 2030. The emissions excl. LULUCF resulting from the conditional INDC target in 2030 would be very close to the current policy projections. Emissions from deforestation would be close to or below present levels in 2030, under this hypothesis. Emissions including LULUCF in Indonesia would increase by about 40% by 2030 on 2010 levels.

The most relevant policy included in Indonesia's current policy projections is the National Energy Policy, which sets up plans for future energy supply. In February 2014, this legislation was updated to target an increase of renewable energy to 23% of primary energy supply by 2025 (LGS Online 2014). The "at least 23%" renewable energy target is included in the Indonesian INDC, even though a target of 25% of energy coming from "new and renewable sources" by 2025 has been discussed in the media ahead of the INDC (The Jakarta Post 2015).

To increase its share of renewables from 6% in early 2014 (ESDM 2014), Indonesia introduced feed-in tariffs for renewable electricity generation and a biofuel quota (CDKN 2014). The CAT calculations thus assume that Indonesia achieves this relatively ambitious target of 23%, although further improvements of the legislative system could enhance current efforts (compare (IEA 2015)).

At the same time, however, Indonesia is pushing the construction of new coal-fired power plants to meet rapidly increasing electricity demand and make use of domestic coal resources. In total, the electricity generation capacity is expected to increase by 35 GW by 2019, of which a large share—20 GW—is expected to be met through new coal-fired power plants (Enerdata 2015). Our current policy projections already take into account a drastic increase of primary energy, with coal increasing strongly as well. The planned capacity is thus included in the scenario already.

An installed capacity of 20GW of coal-fired power plants will emit roughly 160 MtCO2e/a, and thus be responsible for a large share of the overall increase of emissions in the next years. The number reflects a share of 20% of total national emissions excl. LULUCF in 2020. Unless the coal plants are decommissioned before the end of their lifetime, they will continue to emit this amount throughout the next 50 years. Scenarios compatible with holding temperature increase below 2°C indicate that decarbonisation of the power sector is required by 2050 (CAT 2014). .

To supply the coal power plants with fuel, Indonesia aims at exploiting own reserves. In its INDC it also mentions, that the extraction of fossil fuels contributes to land use change emissions. This is an additional negative impact on Indonesia's forests, which are already under much pressure.

Emissions from LULUCF remain very uncertain: including LULUCF, emissions are projected, according to Indonesia's BAU referenced in the INDC, to reach close to 1,800 $MtCO_2e$ (390% above 1990 levels), and nearly 2,900 $MtCO_2e$ by 2030 (620% above 1990 levels). The BAU projects the share of forestry in these emissions to be close to 30% by 2030. However, due to the fact that the Government's scenario assumes LULUCF emissions to keep fluctuating from year to year within a roughly fixed range, setting a below-BAU reduction in emissions is problematic, especially if this target refers to one specific year.

Despite the fact that, as the INDC mentions, Indonesia has temporarily (2010–2016) prohibited the clearing of primary forest and the conversion of peatlands, studies by the FAO and (Margono et al. 2014) still find that the annual forest cover rapidly decreased over 2001–2012. According to these studies, the rate of deforestation has continued to increase in recent years. Emissions reductions expected through current programmes are difficult to assess, as there is a high uncertainty concerning the data for this sector. This becomes clearly visible when looking at the high variability in historical LULUCF data.

A rough estimation can be made on how emissions from deforestation could develop in Indonesia by using such forest cover loss data. From Figure 2 in (Margono et al. 2014), the average rate of deforestation in Indonesia based on satellite imagery over the period 2001–2012 amounted to roughly 485 thousand ha / year, but more striking perhaps is an almost linear trend of the period equivalent to a 20% yearly increase of loss compared to 2001 levels. An estimate of future emissions from deforestation would be much higher than implied by Indonesia's BAU, if one assumes that the emissions intensity of deforestation will not change significantly, and that the same linear trend in forest cover loss will continue up to 2030.

The average emissions level from LULUCF excl. peat in the period 2001–2012 according to the BAU is 270 $MtCO_2$/year. Extrapolating this level from 2001 with the same relative increase as the forest cover loss as illustrated by the linear trend from Margono et al (2014) results in projected emission levels of 1.7 $GtCO_2$/year from LULUCF excl. peat by 2030. This is roughly twice as high as all emissions in the sector AFOLU + peat decomposition + peat fires under the Indonesian Government's BAU. Despite all caveats of such a rough estimation, this approach demonstrates how the roughly constant range of LULUCF emissions in Indonesia's historical and projected BAU data is not at all in line with recent trends of deforestation as estimated by both satellite imagery and FAO data.

Assumptions

Pledge

Up to 2000, we use historic emissions data from the UNFCCC data query. After 2000, we use the historic data provided by the National Center of National Action Plan for Greenhouse Gas reduction (Sekretariat RAN-GRK). There is a difference in the older inventory data and the data used as a basis for the updated national projections. The BAU (both excl. and incl. LULUCF) scenario for Indonesia is taken from the same source. As the emissions levels in 2030 are exactly the same as in the INDC, we assume it is the BAU that the pledge in Indonesia's INDC is based on.

The FAO reports significantly higher emissions from land use in the earlier years (1990–2000), while they are approximately the same size in later years. We show only the national data in the graph to be in line with national reporting.

Since the GHG emission reduction targets in Indonesia's pledge were based on emissions including LULUCF, for the figure showing emissions excluding LULUCF, we assumed that relative reductions below reference are the same in all sectors. This assumption is subject to high uncertainty, especially given the high variability between years in Indonesia's LULUCF emissions.

The LULUCF emissions in the Government's BAU are aggregated from various components: agriculture, land use change excl. peat, peat decomposition, and peat fires. The main reason for the many fluctuations in these emissions is because the Government argues in its BAU, that the emissions from peat fires historically followed, and will follow in the future, an oscillating trajectory (varying between roughly 150 $MtCO_2e$/year and 400 $MtCO_2e$/year), as a consequence of the assumption that peat fire emissions are influenced strongly by the El Niño cycle. This behaviour cannot be observed historically in independent data sources (e.g. FAO).

In the graph in the section "Assessment", we show the BAU (incl. LULUCF) and current policy trajectories (incl. LULUCF) using linear interpolation between the LULUCF emission values of 2015, 2020, 2025 and 2030. This is to enhance clarity and show an overall rate of development at all endorsing the official BAU LULUCF emissions. As the split between agricultural emissions and emissions from land-use is not publicly available, we assume for these graphs that agriculture grows at a similar growth rate as indicated in the 2001 to 2005 time period in Indonesia's second communication.

Current policy projections

We calculate the impact of the renewable energy target from the World Energy Outlook special report on South East Asia 2014, which provides a scenario for Indonesia–including the updated target. Notably, the scenario for Indonesia includes a shift in fossil-fuel use from oil to the cheaper, but more polluting, coal, with its share in energy demand roughly doubling by 2035.

Electricity generation capacity is expected to increase by 35 GW by 2019, of which a large share—20 GW—will be met through new coal-fired power plants. This additional installed coal-fired capacity will emit roughly 160 MtCO2e/a, and thus be responsible for a large share of the overall increase of emissions in the near future - equivalent to around 20% of total national emissions excl. LULUCF in 2020. Unless these coal plants are decommissioned before the end of their lifetime, they will continue producing these annual emissions for the next 50 years. Scenarios compatible with holding temperature increase below 2°C indicate that decarbonisation of the power sector is required by 2050 (CAT 2014).

To supply the coal power plants with fuel, Indonesia aims at exploiting its own reserves. In its INDC it also mentions that the extraction of fossil fuels contributes to land use change emissions. This is an additional negative impact on Indonesia's forests that are already under much pressure

From an examination of Indonesia's BAU, we cannot directly take emissions from deforestation, as these are included in a broader category of ''AFOLU excl. peat''. To still be able to show emissions excl. LULUCF (but including agriculture), we assume that the agricultural emissions follow the trend of the data available for this sector in the National Communication for the years 2001 to 2005.

Sources

Sources

APERC. 2013. Peer Review on Low Carbon Energy Policies in Indonesia. http://apecenergy.tier.org.tw/database/db/ewg46/1_Meeting/11c_PRLCE_in_Indonesia.pdf.

CAT. 2014. Rapid Phase out of Coal Essential, but Not Enough to Hold Warming below 2°C. http://climateactiontracker.org/assets/publications/briefing_papers/CAT_BKM_2014.09.22_PRESS_DISTRIBUTION_final.pdf (October 15, 2015).

CDKN. 2014. Indonesian Feed-in Tariffs: Challenges & Options. http://cdkn.org/wp-content/uploads/2015/04/ECN-Policy-Brief-Indonesian-Feed-in-tariff-140304.pdf.

Enerdata. 2015. "Indonesia Releases Its 35 GW Power Capacity Addition Plan." http://www.enerdata.net/enerdatauk/press-and-publication/energy-news-001/indonesia-releases-its-35-gw-power-capacity-addition-plan_32605.html.

ESDM. 2014. "RPP Kebijakan Energi Nasional, Disetujui." http://www.esdm.go.id/berita/umum/37-umum/6679-rpp-kebijakan-energi-nasional-disetujui.html.

FAO. 2010. 163 FAO Forestry Paper Global Forest Resources Assessment 2010: Main Report. www.fao.org/forestry/fra%5Cnhttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Global+Forest+Resources+Assessment+2010+-+Main+report#0%5Cnhttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Global+forest+resources+assessment+2010:+mai.

Government of Indonesia. 2015. "Draft Intended Nationally Determined Contribution - Republic of Indonesia." http://www.dephut.go.id/uploads/files/18321925e6ce3770e3ebb5090ed8d987.PDF (October 14, 2015).

IEA. 2015. Indonesia 2015 - Energy Policies Beyond IEA Countries. http://www.iea.org/bookshop/704-Indonesia_2015.

LGS Online. 2014. "House of Representatives Passes National Energy Policy." http://www.lgsonline.com/pages/g/lgs52e8715d67339/node/lgs4a1d77eb99e7a.

Margono, B. A. et al. 2014. "Primary Forest Cover Loss in Indonesia over 2000–2012." Nature Climate Change 4: 730–35.

Ministry of Environment, Republic of Indonesia. 2010. Indonesia Second National Communication Under The United Nations Framework Convention on Climate Change (UNFCCC). http://unfccc.int/resource/docs/natc/indonc2.pdf.

Pagiola, S. 2000. "Land Use Change in Indonesia." Background paper prepared for the Environment Department, World Bank, Washington, DC (June 2000).

Sekretariat RAN-GRK. BAU Baseline Emisi Indonesia (Hasil Kaji Ulang). http://ranradgrk.bappenas.go.id/rangrk/beranda/92-bahasa/informasi-sektoral/193-hasil-indc.

The Jakarta Post. 2015. "Govt Pushing Forward 19% New, Renewable Energy Target by 2019 - Minister." http://www.thejakartapost.com/news/2015/05/31/govt-pushing-forward-19-new-renewable-energy-target-2019-minister.html.

Footnotes:

[1] Lower estimate if compared to global total excluding regions with net uptake. Global emissions from LULUCF in the Climate Action Tracker decrease from 4 GtCO2e/a in 2005 to 3 GtCO2e/a in 2015.