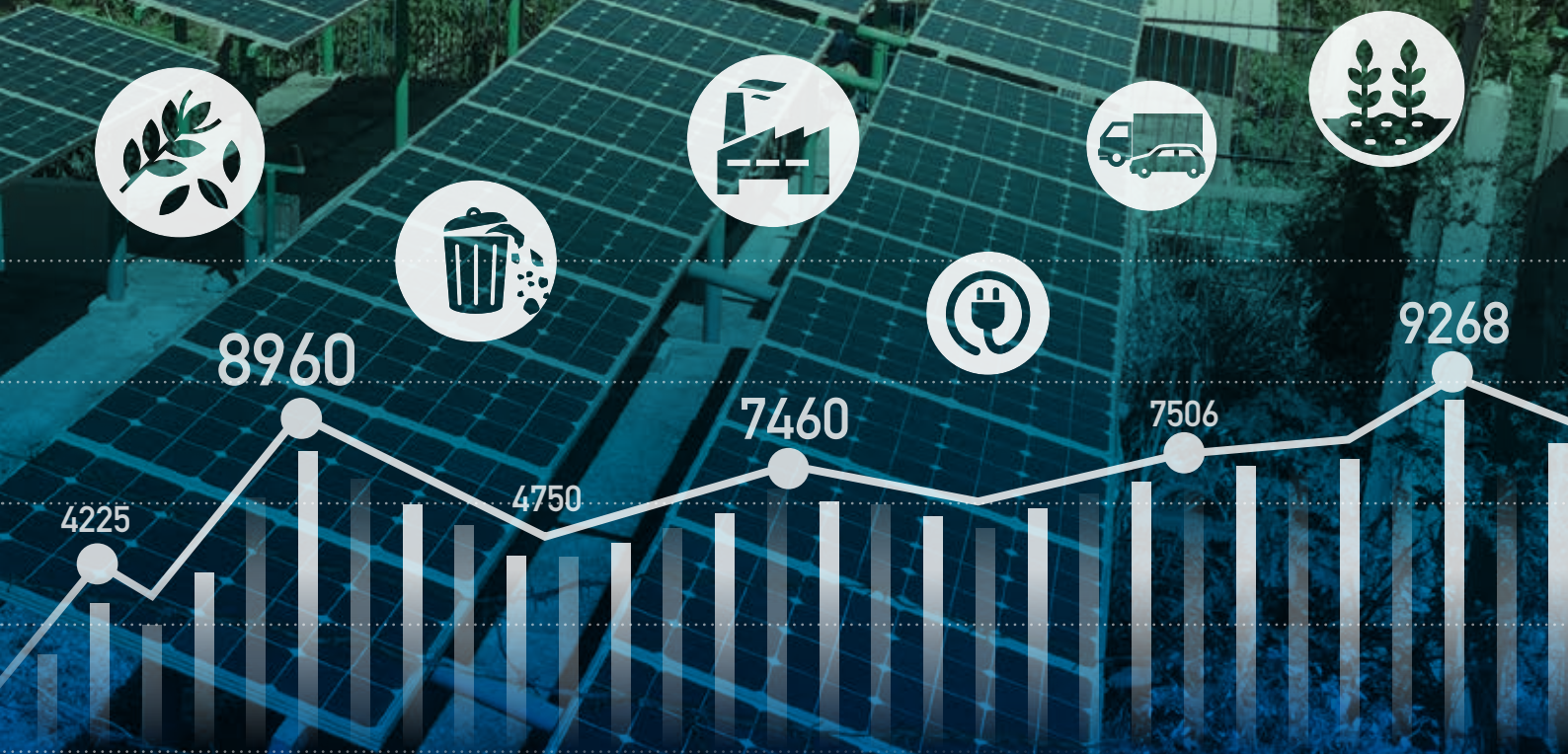Kementerian PPN/
Bappenas

LOW CARBON
DEVELOPMENT
INDONESIA

Low Carbon Development: A Paradigm Shift Towards a Green Economy in Indonesia

Policymakers' Summary

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INTRODUCTION

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**LOW CARBON
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In October 2017, the Government of Indonesia declared its goal of integrating climate action into the country's development agenda. The Low Carbon Development Initiative (LCDI) was launched at Indonesia's Ministry of National Development Planning (BAPPENAS). It aims to explicitly incorporate greenhouse gas (GHG) emissions reduction targets into the policy planning exercise, along with other interventions for preserving and restoring natural resources.

The LCDI is a process for identifying development policies that maintain economic growth, alleviate poverty, and help achieve sector-level development targets, while simultaneously helping Indonesia handle climate change, and preserve and improve the country's natural resources. It is coordinated by BAPPENAS and brings together several Ministries/Institutions from, the development partner (donor) community at the national and global level, local and international partners, distinguished experts, and civil society.

Photo: ICCTF

This report is based on the results of the analysis produced under the technocratic process coordinated by BAPPENAS to support the development of the RPJMN 2020-2024.This Report includes contributions from partners, including the WRI Indonesia, Global Green Growth Institute Indonesia, KnowlEdge Srl, New Climate Economy and partners, with all the above being referred to as the NCE-LCDI Partnership. Other institutions contributing to LCDI and the RPJMN process include International Institute for Applied System Analysis (IIASA), World Agroforestry (ICRAF), System Dynamics Bandung Bootcamp, Sarana Primadata Group (SPD), United Nations Development Program (UNDP).

This work has been made possible with support from UK Department for International Development (DFID) through the UK Climate Change Unit in Indonesia (UKCCU), the Government of Norway, the Government of Denmark and the Government of Germany.

Low carbon development policies are expected to be internalized into the upcoming National Medium-term Development Plan (RPJMN) 2020-2024. The medium-term development Plan is part of the implementation of the National Long-term Development Plan (RPJPN) 2005-2025, which seeks to establish a country that is developed and self-reliant, just and democratic, and peaceful and united. LCDI policies will be implemented to achieve the Indonesia Vision 2045.

LCDI preparation has also received direction and support from prominent public figures and Commissioners of the LCDI: Prof. H. Boediono, Former Vice President of Indonesia; Prof. Dr. Mari Elka Pangestu, Former Minister of Trade and of Tourism and Creative Economy in Indonesia; and Lord Nicholas Stern, co-chair of the Global Commission on Economy and Climate and IG Patel Professor of Economics and Government at the London School of Economics (LSE).

SUMMARY

A CHANGE OF PARADIGM FOR A STRONG, EQUITABLE & LOW CARBON ECONOMY

The Choice

Fewer than twenty years ago, nearly one fifth of Indonesian people lived in extreme poverty. Today, that figure has fallen to less than 10%. Such remarkable progress does not happen by accident. Indonesia's economic and social progress has been driven by a vision and made real by tangible policy decisions that have improved lives and livelihoods for millions of people.

Strong economic growth has been the underpinning for Indonesia's development gains. Between 2000 and 2018 the country had an average GDP growth rate of 5.6% per year. During this time, Indonesia maintained stability in terms of inflation, public finances, and the balance of payments and debt.

All this was despite significant headwinds, including the international financial crisis, steep declines in primary commodity prices, and repeated turbulence in global financial markets.

However, Indonesia is on a development pathway that cannot be maintained. The unsustainable exploitation of natural resources, and the implementation of high carbon development, including inefficient energy use, and transportation systems, have led to:

1 Air and water pollution, especially in large cities such as Jakarta and Bandung;

2 The alarming shrinking of the country's precious forests, due to unsustainable patterns of agriculture, especially in Sumatra, Kalimantan, Sulawesi and, more recently, in Papua and West Papua provinces;

3 A haphazard urbanization process that leads to congestion and urban sprawl;

4 A continued depletion of fisheries, water resources and the country's rich biodiversity;

5 The damaging effects of global climate change, including sea level rise, extreme weather events, and reduced productivity due to higher temperatures.

Continuing down Indonesia's current development path is considered unsustainable, limiting economic growth, job creation, and potential to eradicate poverty.

But Indonesia's growth story is only part way through. Its next chapter will be driven by boundless technological and innovative advances, unimaginable just a generation ago. It will also be written with increasing understanding of the costs and limitations of unsustainable natural resource exploitation, as well as rising social and economic expectations of its young population.

It is with this understanding, that the Government of Indonesia has set out to transform the county's economy into one where progress is measured not only by GDP growth, but also environmental sustainability, resource efficiency, and social equity. That is the sustainable and inclusive growth story of Indonesia for the 21st century.

Photo: ICCTF

Key Findings

The study conducted concluded that a low carbon growth path can deliver an average GDP growth rate of 6% annually until 2045. It would unlock an array of economic, social and environmental benefits (see **Figure 1**), including reducing extreme poverty, creating additional better-paid jobs, and avoiding deaths due to reduced air pollution. Together, these benefits would move Indonesia

into the group of high human development countries. In fact, by the time Indonesia celebrates its 100th year of independence in 2045, per capita income could be 42 times higher than it was in 1945, the year of independence, reaching a level of wellbeing comparable to Germany, Denmark, and Netherlands today.[3] This is Indonesia's vision for 2045. And, with support from international donors and the international financial community, Indonesia will make this vision real.

The benefits to Indonesia's low carbon development pathway are global, as well as local, including

to the local people. Through the sustainable utilization of its natural resources, and by reducing its carbon and energy intensity, Indonesia's total GHG emissions can fall by nearly 43% by 2030. This surpasses Indonesia's target in its national climate action plan, or Nationally Determined Contribution (NDC), presently set at 41% below baseline. And with more ambitious policy measures between 2020 and 2045, (described in **Box 1** as the LCDI Plus Scenario), Indonesia would sustain a long-term decline in GHG emissions, so that by 2045, emissions would be projected to fall nearly 75% relative to the Base Case.[4]

FIGURE 1 | Paradigm Change: Indonesia's New Low Carbon Growth Path
(LCDI High Scenario compared with Base Case)

Meets Indonesia's 2030 climate target!

GHG emissions reduced nearly **43%** by 2030

GDP growth of **6%** per year between 2019-2045

Over **US$5.4 trillion** added to GDP in 2045

40,000 deaths avoided each year in 2045

Extreme poverty **reduced to 4.2%** of population in 2045

15.3 million additional jobs in 2045, which are greener and better paid

Prevents the loss of nearly **16 million ha** of forestland in 2045

Improved **air quality**

Improved **living conditions**

Closing of gender/regional opportunity gaps

Lower investment-to-GDP ratio

Source: Bappenas analysis.

Different Development Paths

BOX 1

The study uses an integrated scientific modeling approach to measure the impacts of different development policies on Indonesia's economy, society and the environment. The following scenarios were considered:

1

THE BASE CASE: No new policies but reflects environmental degradation – This scenario takes into account a continuation of historical trends for the economy, society, climate, and the environment. No new policies are introduced under this scenario. The Base Case does takes into account the impacts that environmental degradation, including pollution and increased scarcity of environmental good and services, has on people and the economy.

2

THE LCDI MODERATE SCENARIO: Includes new low carbon policy measures for 2020-45; achieves the unconditional NDC target—This scenario is consistent with Indonesia meeting its unconditional nationally determined climate target (NDC) of 29% less emissions in 2030 compared with baseline. Under this scenario, the required additional investments are estimated at an average of US$14.8 billion per year in 2020-2024 (about 1.15% of GDP), and US$40.9 billion per year in 2025-2045 (1.39% of GDP). Meeting Indonesia's current unconditional NDC requires a swift, full undertaking of a number of policies described in the Report in both land and energy systems; with no possible room for accommodating "either/or" sets of policies, nor for aiming only for a partial or short-term targets. This means a need for a full, immediate enforcement of forests, peat land, mangroves, and mining moratoria; the undertaking a significant efforts in restoration, and in terms of avoided losses of forests not currently under moratorium; the adoption of agriculture productivity enhancing and other food and waste reduction policies; the acceleration in the pace of reduction in energy intensity relative to historical trends, and the movement towards meeting renewable energy targets that have already been defined in Indonesia's energy policy.

3

THE LCDI HIGH SCENARIO: Includes more ambitious policy measures than LCDI Moderate for 2020-45; achieves the conditional NDC target—This scenario leads to 43% less emissions in 2030 compared with baseline, consistent with Indonesia meeting its conditional national climate target (NDC) of a 41% reduction in emissions by 2030. Total GHG emissions fall from 2.14 $GtCO_2e$ in 2017 down to 1.49 $GtCO_2e$ in 2030. Meeting this target is conditional on sufficient and timely financial and other support forthcoming from the international community. Achieving this scenario would require additional investments relative to the LCDI Moderate Scenario. Total average LCDI High investments per year are: US$22.0 billion (1.7% of GDP) for the period 2020-2024; and US$70.3 billion (2.34% of GDP) for the period 2025-2045. Meeting the conditional NDC requires meeting all the actions in LCDI Moderate, plus the scaling up of efforts in restoration, forest protection, energy intensity reductions and increases in renewable energy shares through 2045. This Report provides numerical targets for all the above.

A FOURTH SCENARIO—THE LCDI PLUS SCENARIO: Reflects LCDI-High for 2020-24, and additional application of more ambitious policy measures thereafter—was also produced. It incorporates an extra level of effort in low carbon policymaking starting at around 2025, so that emissions continue falling through 2045 and beyond. This fourth scenario requires a set of measures not currently under consideration in the RPJMN, such as i) the introduction of mechanisms to put a price on carbon; ii) higher reforestation targets, and iii) policies for even higher improvement in energy efficiency and reduction of waste, mainly from actions at the urban level. These would be part of a new generation of policies to be implemented beyond the RPJMN 2020-2024 window that require transformational changes in government, the private sector, and civil society in general.[5] Following consultations as part of the *Technocratic Process* that supports the RPJMN 2020-2024, these are currently considered as ambitious long-term policies that would require a major structural transformation in Indonesia's development, beyond the current limits of Indonesia's institutional and technical capabilities.
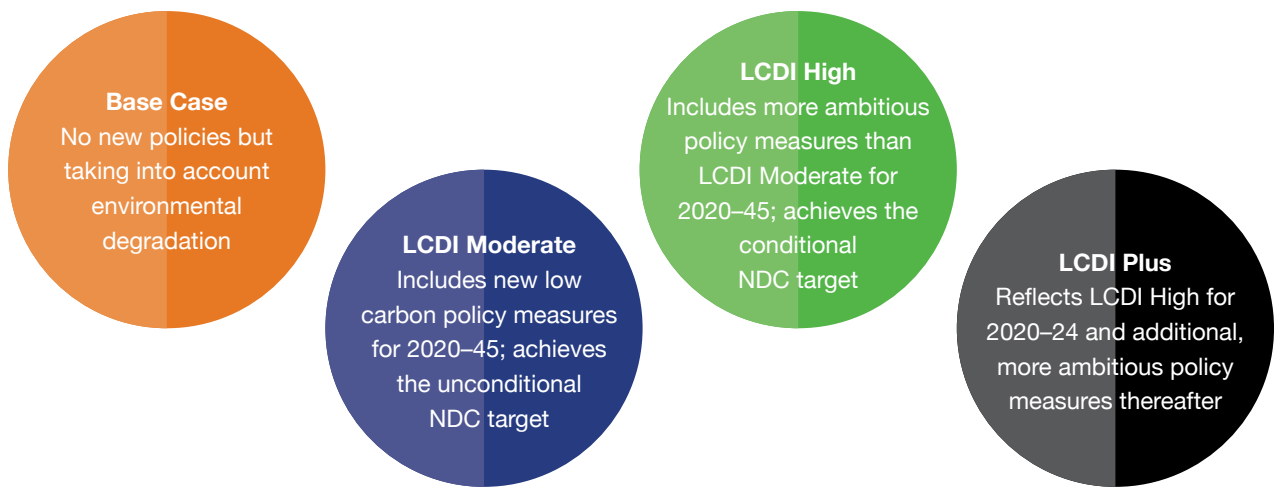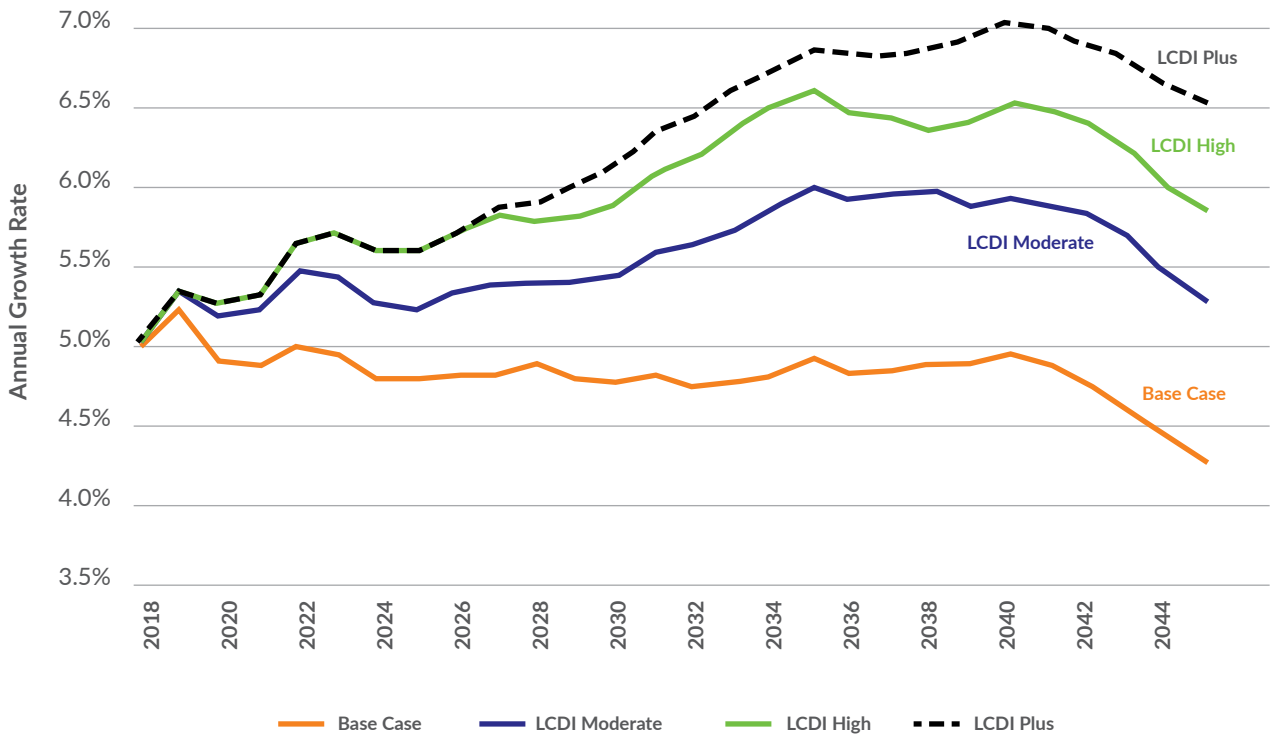
The Immediate Benefits

A low carbon development pathway is more than an option, it is an imperative. It is naturally a win-win-win for Indonesia's economy, for its people, and the local and global environment. More specifically, it could lead to: Robust economic growth; enhanced incomes, labor employment, and wages; higher economic participation for people in the islands, and for more of the country's population; higher availability and better quality of environmental goods and services; more inclusive development; and improved living conditions. The LCDI High Scenario identifies policies and a set of scalable, actionable interventions in different sectors of the economy, many of which have already proven to be successful in Indonesia.[6] Relative to the Base Case, the LCDI High Scenario would deliver sustained average economic growth rates of 5.6% through 2024, and 6.0% through 2045.[7] In 2045, it would also deliver: Over US$5.4 trillion added to GDP; more than 15.3 million additional jobs, which are greener and better paid; a reduction in poverty from 9.8% of total population in

2018 down to 4.2%; 40,000 avoided deaths each year, due to improved air quality; and prevention of the loss of nearly 16 million ha of forestland relative to a Base Case. The LCDI High Scenario would also lead to a closing of the gender and regional opportunity gaps, as well as a lower required investment-to-GDP ratio. And in terms of emissions, the LCDI High Scenario would deliver a GHG emissions reduction of almost 43% by 2030, exceeding Indonesia's conditional national climate target (NDC) of 41% below baseline (see **Figure 3**).

It is noteworthy that by applying the Base Case scenario without implementing any policy interventions, economic growth will decrease gradually starting in 2019. This is due to decrease in the quality of environment, pollution, and scarcity of resources. In addition, there is a pressure on energy needs, leading to increases in price and decreases in productivity. As a result, under the Base Case scenario, the rate of economic growth progressively decreases post-2024, reaching 4.3% in 2045.

Furthermore, it is important to understand that the negative impacts from inaction are greater than the model can describe, for instance, potential loss of assets, especially in coastal areas caused by climate change; or the effects that ecological fragmentation, loss of biodiversity and resource depletion, have on economic activity. Furthermore, the positive impacts of the actions within LCDI scenario could potentially bring greater impact, beyond what can be modeled. For example, the full benefits of an energy transition, including in terms of the opportunities for technological progress and the potential for dramatically falling prices of new technologies (as has been seen recently with renewable energy and battery storage technologies), may not be sufficiently reflected either.

FIGURE 2 | GDP Growth Trajectories for Scenarios Modeled for This Report

Base Case
No new policies but taking into account environmental degradation

LCDI Moderate
Includes new low carbon policy measures for 2020–45; achieves the unconditional NDC target

LCDI High
Includes more ambitious policy measures than LCDI Moderate for 2020–45; achieves the conditional NDC target

LCDI Plus
Reflects LCDI High for 2020–24 and additional, more ambitious policy measures thereafter

Source: BAPPENAS Environment Directorate, based on results from Indonesia Vision 2045 Model – IV2045.

Photo: ICCTF

Moreover, failing to act on low carbon policies could lead to over one million more people living in poverty relative to the LCDI High Scenario; as well as higher mortality and lower human development. Annual deaths would be more than 40,000 higher per year in the Base Case than in the LCDI High Scenario. Progress in education and health would be slowed down. The cumulative losses of income would be US$130 billion over the period 2019–2024.[9] In short, Indonesia has so much more to gain by taking a low carbon pathway.

These findings are inspiring and exciting. But it is important to note that, depending on the nature of the economic activities on which they depend, not every single person and business in Indonesia stands to benefit from the transition towards a low carbon economy. A relatively small fraction, especially those that rely upon high carbon sectors and on activities that deplete Indonesia's natural resources, may be negatively impacted. It is crucial for LCDI policies to be implemented in a way that is compatible with a just transition, whereby people and communities are supported as they re-deploy and build new capabilities

to participate in and benefit from the new low carbon economy.

One key outstanding issue is that, even if its conditional national climate target (NDC) is met, under the LCDI High Scenario, Indonesia is not yet on track to reduce total GHG emissions in the long term. By 2045, GHG emissions would then be 41% below the Base Case but will have grown in absolute terms. This is due to higher per capita incomes and increased population that are not compensated by improvements in carbon and energy efficiency. It also reflects the fact that both the Moderate and High LCDI Scenarios are formulated on the basis of policies that are currently understood to be technically and politically feasible, including policies on energy, efficiency, waste, forest management, and other food and land use issues. These are policies that can be implemented through the reinforcement of Indonesia's current institutional, technical and organizational capabilities, including political economy considerations. However, there are many actions that could deliver further emissions reductions that are not incorporated into these LCDI Scenarios.

Decoupling Indonesia's economy from its GHG emissions will require both a substantial and rapid improvement of those capabilities and "thinking out the box" on climate policy options. For example, the latter might entail the consideration of mechanisms to put a price on carbon that are representative of its social cost and of the externalities associated to carbon emissions, so that it prompts an even more substantive shift to renewable energy over the next two decades. It would also entail the adoption of more stringent policies or standards for: enhancing energy efficiency, embracing circular economy principles for the development of cities, of modern low carbon or even zero carbon transportation systems; a full scale revamp of food and waste systems; even more ambitious scaling up of reforestation and other ambitious approaches for the sustainable management of forests; and embracing smarter, intensive, climate-resilient agriculture production practices.

FIGURE 3 | Emissions Trajectories for Scenarios Modeled for This Report
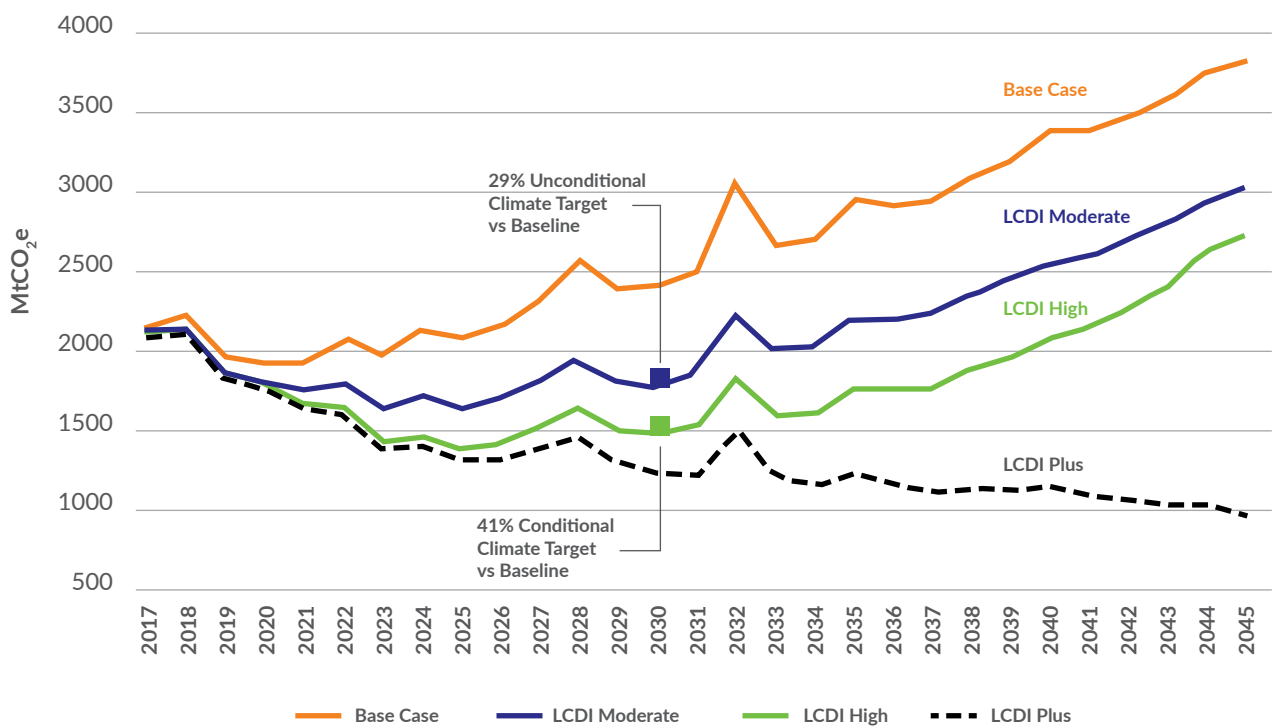
Base Case
No new policies but taking into account environmental degradation

LCDI Moderate
Includes new low carbon policy measures for 2020–45; achieves the unconditional NDC target

LCDI High
Includes more ambitious policy measures than LCDI Moderate for 2020–45; achieves the conditional NDC target

LCDI Plus
Reflects LCDI High for 2020–24 and additional, more ambitious policy measures thereafter

Source: BAPPENAS Environment Directorate, based on results from Indonesia Vision 2045 Model – IV2045.

Photo: ICCTF

The Actions that Can Deliver Better Growth

The Report lays out why Indonesia needs to shift to a low carbon development pathway, and what its people and the world can gain from making this paradigm change. It also lays out the tools with which Indonesia can realize its vision.

A low carbon economy is built on sustainable infrastructure. This needs to be accompanied by an ambitious scaling up and diversification of sources of green finance towards low carbon sources of energy. It also requires the protection and restoration of valuable natural infrastructure, such as wetlands

and forests, including peat land systems and mangroves. These efforts spur resource efficiency and technological progress, leading to a long-lasting boost in productivity.

Such projections are consistent with authoritative research conducted elsewhere. The 2018 Report of the Global Commission on the Economy and Climate, *Unlocking the Inclusive Growth Story of the 21st Century* (New Climate Economy, 2018), highlights wide evidence from countries, businesses, and others, already reaping the economic and development benefits

of accelerating the low carbon and climate-resilient transition.

Realizing this vision for Indonesia requires a public policy framework that unambiguously provides clear incentives and signals for entrepreneurs and individuals to move towards a low carbon economy; acts upon existing regulations and directives that apply to land, energy, biodiversity and water resources; and fosters the sustainable utilization of the country's environmental resources.

How exactly will low carbon policies deliver such better social and economic outcomes, almost immediately, consistently, and across the board? Overall, the LCDI High Scenario combines, among other things, the following intermediate targets:
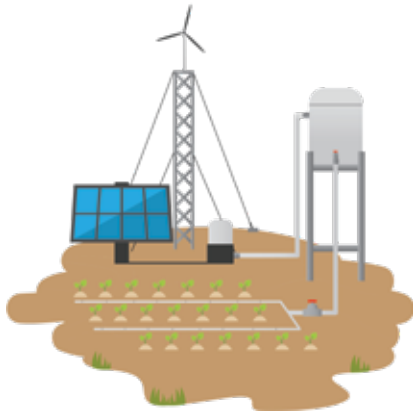
Advancing a transition to renewable sources of energy and away from coal: in particular, scaling up of the share of renewable energy from about 8% in 2015, up to 23% by 2030, and further to 30% in 2045.

Increasing energy efficiency, which, together with a transition towards renewable sources of energy, would yield a reduction in energy-to-population intensity—the ratio of total energy consumption per person—by 3.5% in 2030, and by 4.5% in 2045, both relative to 2018. Emission intensity—the ratio of total GHG emissions to value added GDP—would fall by more than one third in 2030, and 60% in 2045, relative to 2018.

A full enforcement of forests, palm oil, mining and peat land moratoria,[10] so that by 2045, Indonesia will still be endowed with 41.1 million ha of primary forests, including nearly 15 million ha of peat lands. Of special interest are primary forests, such as those in Papua and Kalimantan, and key peat lands and mangrove systems that support biodiversity, enhance resilience and contribute to carbon emissions reduction targets.

Abiding to committed targets in water, fisheries and biodiversity, as defined by the Aichi Targets (global targets to reduce the loss rate of biodiversity), the Nagoya Protocol (which regulates access to genetic resources and the fair and equitable sharing of benefits arising from their utilization) and the Convention on Biological Diversity, that are reflected in the Indonesia Biodiversity Strategy and Action Plan (IBSAP) 2015–2020.

Increases in land productivity by 4% per year, so total value added per unit of land multiplies 2.3 times between 2018 and 2045, while reducing land intensity per capita by 1.6% during the period.

Photo: ICCTF

Photo: ICCTF

The LCDI High Scenario policies positively feed into each other, resulting in:

- An improvement in the effectiveness of labor from enhanced human capital, which is associated with higher air and water quality, and better living conditions under a better-preserved natural capital base;

- An increase in economic efficiency, when households and industries are able to reduce energy inputs for generating a given amount of output. Cost efficiencies will also be developed over time as the cost of renewable energy continues falling below that of high carbon sources, including coal;

- Increased agricultural productivity under a coherent set of food and land use policies that can not only augment yields and reduce land intensity, but these can also contribute to efficiency gains (from reduced waste) and to human capital accumulation (from a shift to healthier diets);

- An acceleration in the rate of technological progress. Renewable energy is increasingly more cost efficient than high carbon sources. It is also the case that research and development (R&D) on renewables produces technological spill overs for the rest of the economy; something that has been observed across countries that have embarked on an energy transition. Such transition yields net gains in employment, as sectors associated to renewables are more labor intensive than high carbon activities;

- A higher provision of better-quality environmental goods and services. More and better environmental goods and services result in higher net savings which accumulate to the country's natural capital base, reinforcing other types of capital (physical, human, social) and thus increasing Indonesia's economic growth potential.

Photo: ICCTF

All the above reflects the intrinsic power of the LCDI Scenarios' policies to deliver immediate gains for the economy, for people and for the local and global environment. The extent of these gains will, of course, depend upon the effectiveness and speed at which such policies are put in place.

On energy, Indonesia's advantage in and incentive to embark upon a rapid, optimistic, bold transition towards renewable energy are both enormous and, yet, under-appreciated. Meanwhile, Indonesia's continued reliance on coal is built upon a now-outdated perception that the cost of coal is lower than alternative sources of energy, along with a set of political economy considerations.

However, **Figure 4** indicates that once the relative costs of coal, gas and renewable energy are broken down into: i) costs to the government-owned utility *Perusahaan Listrik Negara* (PLN), which has a monopoly on electricity distribution; ii) subsidies; and iii) the often-ignored externalities like local air pollution and global climate costs, it is clear that:

i) The overall cost of new coal projects is now higher than renewable energy generated from new wind, solar, geothermal, and hydropower projects.

ii) Even when only the local direct and air pollution costs to Indonesians are considered, renewable energy is not cost-competitive with new coal capacity.

iii) The current reliance on coal is damaging the health of Indonesians. Increasing the pace of renewable energy deployment would lead to lower health costs and better public health.

iv) The cost of renewables in Indonesia is likely to rapidly fall toward international benchmark prices. Indonesia is an outlier in terms of high costs of generation from renewables, particularly for solar and wind. This is in part because other countries have already seen economies of scale that significantly reduce the deployment costs of these technologies. Indonesia is likely to rapidly realize such economies of scale as it expands renewables deployment.

v) As Indonesia's renewable project costs fall closer to international benchmarks, these will be the cheapest forms of electricity generation, lower than recent Power Purchase Agreement prices for coal and gas, even without taking external costs into account.

FIGURE 4 | Relative Cost of Coal and Renewable Sources of Energy
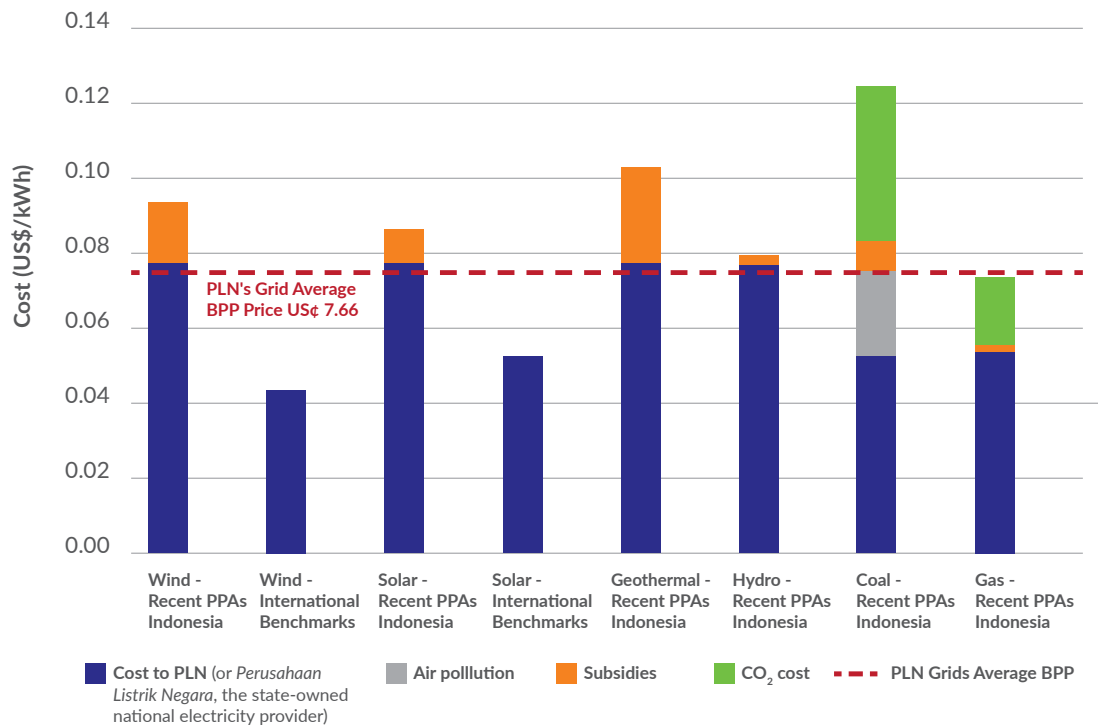
Source: IISD, 2019 from Koplitz et al. 2017; IHME 2016; Lazard's 2017; ESDM 2017; Indonesia Investments 2018; BP 2017; Burnard et al. 2016; Interagency Working Group on Social Cost of Greenhouse Gases 2016; Turconi, Boldrin, and Astrup 2013.

It is clear, therefore, that it is perceptions—and not the renewable energy technologies or costs—that must catch up to Indonesia's energy reality.

In terms of land use systems, Indonesia has taken a significant step toward improving management of forest resources through its moratorium on new licenses to convert primary natural forests and peat lands. On 19th September 2018, Indonesia's President signed a moratorium on new palm oil development and ordered a review of existing plantations. This moratorium acknowledged that many planned palm oil plantations are inside forest areas, also providing an opportunity to clarify the legal rights of villagers

and smallholders that are affected by the measure. This new moratorium, along with other forest protection measures could create a much-needed window of opportunity to undertake critical forest governance and agricultural and land use reforms. These reforms could lead to long-term improvements in the way land-use decisions are made in the country, to the benefit of the Indonesian people and to global climate stability.

Along with embracing sustainable palm oil practices, Indonesia has unique opportunities to achieve greenhouse gas emission reductions while increasing well-being and resilience to climate-related threats. Such threats include fire haze and sea

level rise, which jeopardize economic activity and livelihoods for a significant fraction of the population. Means for improvement include coordinated efforts in protecting very sensitive forest areas, including peat lands and mangrove ecosystems, which are powerful natural sources of carbon storage, and, in the case of mangroves, can act a natural defense to harsher conditions of coastal environments. The latter point was demonstrated by the tragedy of the 2004 Indian Ocean earthquake and tsunami, and recently, in December 2018, with the Sundra Strait Tsunami, when many lives were saved in communities that lived in areas protected by mangroves systems.

Indonesia can maximize benefits from forest and land use interventions by establishing policies and providing incentives for increased land productivity and through the integration of food and land management systems. This could help to improve and integrate the food and land use system at the global scale while simultaneously:
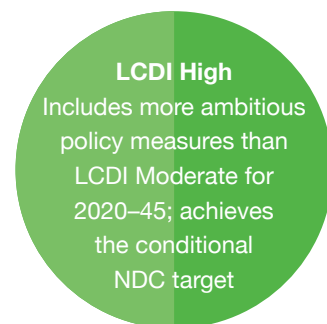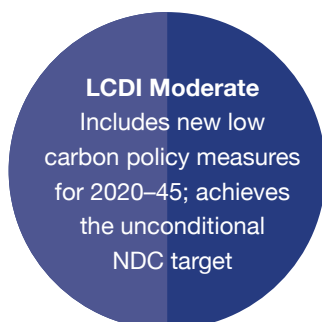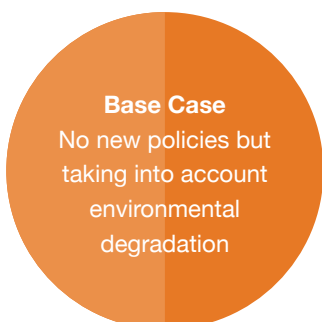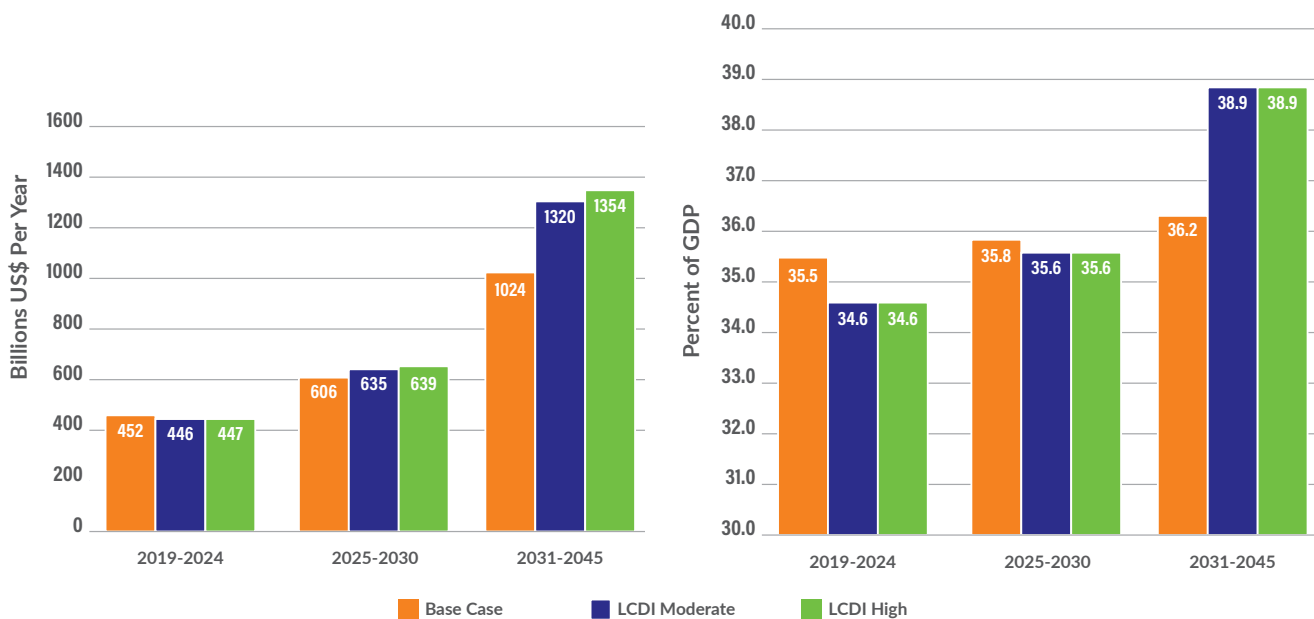
1. Protecting, and over time regenerating, precious natural resources and complex biophysical systems, including forests, peat lands and water systems—while managing increasing demands on the land;

2. Shifting food and land use systems from contributing a quarter of global greenhouse gas emissions to becoming a net carbon sink;

3. Finding a healthier, less wasteful way to feed over nine billion people globally by 2050; and,

4. Providing a more prosperous and resilient lifestyle for farmers and their families, in rich and poor countries alike.

In terms of financing the low carbon transition, this Report shows evidence that neither the Government of Indonesia alone, nor with the current support of bilateral and multilateral development organizations, will be able to pool the necessary resources for a rapid, successful movement towards a low carbon economy. Private capital, domestic and foreign, and smart blended financing are required, especially for investment in sustainable infrastructure that will support the transition. This requires immediately setting up of mechanisms of governance and participation for mainstreaming low carbon policies in order to create a clear, stable policy environment to attract and guide private finance.

FIGURE 5 | Total Investments (left side) and Share of Investment to GDP (right side) in LCDI Scenarios Relative to Base Case, by Periods

Base Case
No new policies but taking into account environmental degradation

LCDI Moderate
Includes new low carbon policy measures for 2020–45; achieves the unconditional NDC target

LCDI High
Includes more ambitious policy measures than LCDI Moderate for 2020–45; achieves the conditional NDC target

BOX 2

Financing the LCDI Scenarios

The government of Indonesia has identified the financing resources that are required to reach Indonesia's unconditional and conditional national climate targets (NDCs), and, by extension, the international support required to reach the conditional target. This Report presents cost estimates for reaching a given level of GHG emission reduction from various specific policies on land, energy systems, energy efficiency, waste and others.

Under the LCDI High Scenario, total average investments needed are estimated at US$446.5 billion (34.6% of GDP) for the period 2020–2024.[11] Out of those total investments, about US$21.9 billion per year correspond to specific low carbon development capital spending identified in this Report for the period 2020-2024. The additional LCDI High Scenario investments would thus represent about 2.3% of GDP through 2045.

The difference between total investments included in the LCDI High Scenario and those in the LCDI Moderate Scenario (0.56% of GDP between 2020–2024, and around 0.95% of GDP thereafter through 2045) can be seen to reflect the international investment needed from the international finance community in support of Indonesia to meet its conditional NDC target.

Most significantly, the LCDI High Scenario requires a lower investment-to-GDP ratio, so that Indonesia will require a lower effort to bridge any potential savings gap to finance economic growth. In other words, a low carbon economy gives Indonesia more return for less investment.

Putting in place the right policies and interventions, as well as ensuring the availability of financing, will need to be accompanied by substantive adjustments in institutional design, including a shift in mind-sets of individuals and agents, consistent with the new growth paradigm. New governance approaches will be required to: coordinated actions across different line ministries and other national and regional government entities, the private sector and the domestic and international financial community; and definition of methods for aligning policies and establishing effective monitoring and evaluation.

This Report also explores what would it take for Indonesia to move into a long-term declining GHG emissions pathway that is more ambitious than the country's conditional climate target (the LCDI Plus Scenario). Such a pathway requires a combination of more ambitious policy targets than those incorporated in the LCDI Moderate or High Scenarios, as well as a new generation of policies, including new policies on urbanization, embracing circular economy ideas, and others that would better reflect the social cost of carbon into market prices.

This Report spells out why Indonesia should pursue a low carbon economy, and what it will take for Indonesia to realize its 2045 vision. It focuses on climate mitigation, the current focus for the RPJMN 2020–2024, but it also introduces some ideas regarding the importance of climate risk resilience and adaptation to climate change, which need to be taken on in conjunction. The Report provides strong evidence than an accelerated transition to a low carbon economy, that relies heavily on smartly-funded sustainable infrastructure, and acting upon already defined regulations for preserving the country's natural resources, can lead to immediate win-win-win outcomes for the economy, for people, and for the local and global environment. In the process, it exposes the fallacy of the notion that there are fundamental trade-offs involved in implementing low carbon development policies, even in the short term.

As with any major structural changes, this transition must be well-managed, particularly for those workers and communities engaged in declining industries, to ensure a smooth transition to the new, more innovative and productive, and more sustainable economy. But it is possible, and overall it represents a cleaner, healthier and more prosperous development path for Indonesia. The only question that matters now is, "What are we waiting for?"

Photo: ICCTF

Endnotes

[1] RPJPN, from Bahasa Indonesia *Rencana Pembangunan Jangka Panjang Nasional*.

[2] RPJMN, from Bahasa Indonesia *Rencana Pembangunan Jangka Menengah Nasional*.

[3] Well-being as measured by Parity Purchasing Power (PPP). See: Bolt, Inklaar, Jong, & Zanden, 2018.

[4] An emissions reduction of nearly 43% emissions by 2030 reflects the LCDI High Ambition Scenario modeled for this Report using BAPPENAS' Indonesia Vision 2045 and INDOBIOM models. See also Box 1.

[5] A fifth scenario loosely referred to as the High Carbon Scenario (HCS) has also been prepared. This is a hypothetical analysis whereby Indonesia brings additional resources to support policies and initiatives considered under RPJMN 2020-2024. These are either completely ineffective in achieving low carbon, green targets, or they are used to pay for things other than to finance low carbon development policies, for example on grey infrastructure, financing high carbon sectors, or actually paying the costs associated with increasing air and water pollution and other externalities. So instead of investing the full amount of those additional resources for development, some are used as current expenditure to offset the negative effects from pollution and degradation. This is an important scenario to consider as a reference case, because it allows the appraisal of impacts on social, economic, climate and environmental outcomes of low carbon policies, given a comparable total expenditure effort. The Base Case cannot play that role as reference scenario because it includes less investments than other scenarios, something that, other things equal, yield, for instance, lower GDP growth. Rather than being a revenue neutral scenario, HCS assumes, other things equal, a similar initial fiscal impact on the economy than LCDI scenarios. The total absorption (consumption plus investments) under the LCDI Moderate Scenario are similar to total absorption being considered under RPJMN 2020-2024, so other things equal, they have similar impact on internal aggregate demand.

[6] Empirical results are extracted from the Indonesia Vision 2045 and INDOBIOM models.

[7] In 2017, Indonesia's GDP was estimated to be IDR 13,600 trillion. At current prices, this is US$3,982 per capita (or IDR 51 million per capita) given a total population of 264 million. A 6.3% annual GDP growth rate would result in a GDP per capita rate of just over US$18,000 by 2045.

[8] GDP growth under the Base Case Scenario immediately falls behind GDP growth in both the LCDI Moderate and LCDI High Scenarios, starting in 2019, reflecting the negative economic impacts from increasing pollution, negative externalities, and the increasingly limited availability of environmental goods and services in Indonesia.

[9] These amounts are the sum of the differences in value added GDP between the LCDI Scenario and the Base Case Scenario for the period 2018–2045, in 2017 prices. By 2045 alone, the LCDI High Scenario results in an additional US$1.55 trillion (in 2017 prices) compared to the Base Case Scenario.

[10] Presidential Instruction No. 10/2011 suspended for two years the issuance of new licenses and improvement of governance of primary natural forest and peat land. The moratorium since has been extended three times for two-year periods, most recently via Presidential Instruction No. 8/2018.

[11] These compare with average annual investments of US$345 billion for 2016–2018 (34% of GDP).

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