AMICI CURIAE BRIEF

(Pendapat Hukum Para Sahabat Pengadilan)

State Administrative Lawsuit on Cancellation of Bali Governor's Decree No.660.3 / 3985 / IV-A / DISPMPT About Environmental Permit Development of Steam Power Plant (PLTU) given to PT. PLTU CELUKAN BAWANG ON THE VILLAGE ON THE SUPPORT OF GEROKGAK DISTRICT, REGENCY OF BULELENG.

I Ketut Mangku Wijana, Baidi Sufarlan, I Putu Gede Astawa, and Greenpeace Indonesia (Plaintiffs)

Against

Governor of Bali Province based in Bali Governor's Office, Jalan Basuki Rachmat Number 1, Denpasar City, Bali Province, Indonesia (Defendant)

Submitted By:

Indonesian Center for Environmental Law (ICEL)
Earthjustice
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I. INTERESTS OF AMICI CURIAE

To assist this Court in resolving the issues presented by the Plaintiffs in their administrative lawsuit requesting cancellation of Bali Governor's Decree No.660.3 / 3985 / IV-A / DISPMPT (Environmental Permit for Development of a Steam Power Plant (PLTU) given to PT. PLTU Celukan Bawang), the undersigned parties respectfully submit this amicus curiae brief reviewing international law and best practices on the need to include climate change impacts in an environmental impact assessment for a steam power project such as PLTU Celukan Bawang. Amici respectfully urge the Court vacate the Governor's Decree granting an environmental permit for the expansion of PLTU Celukan Bawang until a full assessment of the climate impacts of the project has been completed.

Amici are non-profit organizations that engage in legal work and advocacy for better environmental laws to hold polluters and governments accountable for environmental and climate harms. Amici have expertise in environmental law, environmental impact assessment, and climate law and policy.

II. INTRODUCTION

The environmental impact analysis (*Analisa Dampak Lingkungan* or ANDAL) for the PLTU Celukan Bawang fails to apply the principles of national environmental management set forth in the Law on Environmental Protection and Management (Law no. 32/ 2009) and the relevant implementing regulations because it does not include a comprehensive climate change impact assessment. Moreover, meeting Indonesia's international climate commitments requires an accurate accounting of the climate impacts of major fossil fuels projects such as PLTU Celukan Bawang and a determination whether this project can be implemented without violating those commitments

An assessment of climate change impacts requires more than simply quantifying the projected greenhouse gases generated by operation of PLTU Celukan Bawang. Although the ANDAL must comprehensively consider the project's GHG emissions and contribution to global warming, it must also consider several additional aspects of the relationship between the proposed project and climate change, including:

1. the project's direct contributions to climate change over the life-cycle of the project;
2. the ways in which the effects of climate change will impact the project, for example the impacts of sea level rise and storm surges on the physical integrity of the project, including coal handling and coal ash storage facilities; and
3. how the project's impact on the environment and communities will be affected further by climate change, i.e. the ways in which climate change might exacerbate the environmental impacts of the project and the ways in which the project would increase Indonesia's vulnerability to climate change.

Because climate change impacts assessment is relatively new, the Court should consider best practices from other jurisdictions and international organizations to ensure a comprehensive

and reliable assessment of the climate impacts of PLTU Celukan Bawang in accordance with Law no. 32/2009 and implementing regulations. Authoritative sources include:

- *Earthlife Africa Johannesburg v the Minister of Environmental Affairs and 4 others* (NGHC), case number: 65662/16 (March 8, 2017).
- United States Council on Environmental Quality, "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews," (August 1, 2016).
- European Commission, "Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment," (2013).
- Jessica Wentz, "Assessing the Impacts of Climate Change on the Built Environment under NEPA and State EIA Laws: A Survey of Current Practices and Recommendations for Model Protocols," Sabin Center for Climate Change Law, August 2015.
- World Resource Institute and the World Business Council on Sustainable Development, Greenhouse Gas Protocol.
- Intergovernmental Panel on Climate Change (IPCC), Guidelines for National GHG Inventories for Energy, (2006).

III. PLTU CELUKAN BAWANG

PLTU Celukan Bawang is a 380-megawatt (MW) coal-fired power station in Celukan Bawang, Buleleng Regency, North Bali, Indonesia. The power station is located in rural, northern Bali between West Bali National Park and a coastal region dependent on tourism and subsistence fishing. On April 28, 2017, the Governor of Bali Province signed a decree granting an environmental permit for expansion of PLTU Celukan Bawang to add two additional 330 MW generating units, bringing the total capacity to over 1,000 MW.

Reliance on coal for energy comes with tremendous costs because it is incredibly dirty. The same chemistry that enables coal to produce energy—the breaking down of carbon molecules—also produces a number of profoundly harmful environmental impacts and pollutants that harm public health. Air pollution, water pollution, contamination from coal ash handling and storage, and global warming are some of the most serious.

The existing power station is already causing significant negative impacts on the local communities and surrounding environment. For example, damage to soils and marine resources in the vicinity of the plant has destroyed farming and fishing livelihoods and contributed to the impoverishment of the local communities; air pollution from the plant has increased incidences

of respiratory illnesses; and improper handling of coal ash has polluted soils and the surrounding marine ecosystems.[1] Expansion of PLTU Celukan Bawang will only exacerbate these harms.

PLTU Celukan Bawang also has significant climate impacts. Global warming is driven by emissions of heat-trapping gases, primarily from human activities, that rise into the atmosphere and act like a blanket, warming the earth's surface. Consequences include rising temperatures and accelerating sea level rise as well as growing risks of drought, heat waves, heavy rainfall intensified storms, and species loss. Left unchecked climate change could lead to profound human and ecological disruption.

Carbon dioxide (CO2) emissions from combusting fossil fuels are the main driver of global warming. CO2 is also the main byproduct of coal combustion: nearly 4 grams of CO2 are produced for every gram of carbon burnt (depending on its type, coal can contain as much as 60 to 80 percent carbon). According to the ANDAL, the addition of 2 x 330 MW generating units at Celukan Bawang will burn 2,950,635.60 tons of coal per year during its operating period. Assuming that PLTU Celukan Bawang will operate at 85 percent efficiency[2] for 30 years in accordance with the plant's business license, the Celukan Bawang expansion will result in the burning of at least 75,241,207.8 tons of coal over the course of the plant's operational life. This will result in the release of more than 200 million tons of CO2 over the thirty-year life of the plant.

In addition, the project is vulnerable to the effects of climate change, such as sea level rise and increasing ocean temperatures. At Celukan Bawang, the project site ranges from 0 to 12.5 meters in elevation.[3] (The elevation of the coal stock yard and ash yard are not specified.) The Fifth Assessment Report of the Intergovernmental Panel on Climate Change of 2014 projected sea levels would rise 85cm by 2100 if nothing is done to limit carbon pollution. As of October 2017, current research that incorporates rates of Antarctic ice loss projects sea level rise as high as 1.32 meters by 2100.[4] Sea level rise as high as 1.32 meters would increase the risk of coastal flooding and storm surges, which would affect operation of the plant, including threats to coal ash containment structures.

Moreover, coral reefs in north Bali—as they are globally—are threatened by increasing sea temperatures and acidification. Loss of coral reefs near the project site will further expose and erode the sandy beach at the project site, subjecting the revetment wall to greater wave impacts than it is designed to withstand, potentially exposing both the coal stock yard and the ash yard to storm surges.

Plaintiffs challenge the Governor of Bali's issuance of an environmental permit for development of PLTU Celukan Bawang on multiple grounds, including the Governor's failure to

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[1] Greenpeace, *Celukan Bawang Coal-Fired Power Plant: Polluting Paradise* (April 2018), http://m.greenpeace.org/seasia/Global/seasia/report/2018/Celukan-Bawang-CFPP-Polluting-Paradise.pdf.
[2] ANDAL, p. I-23.
[3] ANDAL, p. II-26.
[4] *See* Michael Slezak, *Sea levels to rise 1.3m unless coal power ends by 2050, report says*, The Guardian, (26 Oct. 2017), https://www.theguardian.com/environment/2017/oct/26/sea-levels-to-rise-13m-unless-coal-power-ends-by-2050-report-says.

take into consideration the impacts of climate change. Amici respectfully urge the Court to set aside the environmental permit until a full assessment of the climate impacts has been completed, including quantification of the greenhouse gas emissions attributable to the project; assessment of how climate change may impact operation of the project; and consideration of how the environmental impacts of the project may be exacerbated by the effects of climate change.

IV. ARGUMENT

A. Obligation to Consider Climate Impacts

Climate change is a fundamental environmental issue and its effects fall squarely within the purview of Law no. 32/2009, which explicitly recognizes that a changing climate requires sound environmental management. (Law no. 32/2009 Preamble, ¶ (e).) Moreover, climate change is effecting Indonesia in many ways across diverse sectors important to Indonesian society, including human health, agriculture and food security, water supply, transportation, energy, ecosystems, and others. Analyzing a proposed action's GHG emissions and the effects of climate change relevant to a proposed action—particularly how climate change may change an action's environmental effects—provides essential information to decision makers and the public.

1. The Law on Environmental Protection and Management and Implementing Regulations

Under the Law on Environmental Protection and Management[5] any activity that may have significant environmental impacts requires an ANDAL. An ANDAL must contain an assessment of the impacts of the activity, forecasts of the magnitude and specific nature of the impacts that would occur if the activity were to be implemented, and a holistic evaluation of the impacts to determine the environmental feasibility or inappropriateness of the activity.[6] Because the climate impacts of the PLTU Celukan Bawang project are significant, it is clear that climate change must be evaluated in the ANDAL. Moreover, it is impossible to accurately assess how a project will impact the environment without consideration of the role of climate change. Ministry of Environment Regulation No. 16 of 2012 requires that an ANDAL assess the project's potential environmental impacts, compare them with those of feasible alternatives (including the "without project" situation), and recommend measures to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance. Without an understanding of how PLTU Celukan Bawang will contribute to climate change and how climate change may change the project's environmental effects, government decision makers and the public will be unable to determine the risks and costs associated with the project and an informed decision about the appropriateness of the project is impossible.

[5] *See* Article 22(1) of Law no. 32/2009 and Article 3 of Government Regulation no. 27/2012.
[6] Article 25 of Law no. 32/2009.

2. Indonesia's International Obligations

Indonesia cannot fulfill its international climate obligations without considering how proposed fossil fuel projects contribute to Indonesia's greenhouse gas emissions. Thus the PLTU Celukan Bawang ANDAL should take into account the state's international obligations to mitigate climate change. Indonesia has ratified the United Nations Framework Convention on Climate Change, and subsequent protocols, which require parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. In particular, the Convention includes a commitment by the Parties to: "[t]ake climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change[.]"[7]

Indonesia's international climate change commitments are outlined in its Nationally Determined Contribution (NDC)[8] and the Paris Agreement. Indonesia's NDC includes a unilateral reduction target of 29% below "business as usual" emissions of greenhouse gases (including LULUCF[9]) by 2030, plus a conditional 41% reduction target with sufficient international support. Indonesia ratified the Paris Agreement in October 2016, reiterating the pledge of 29% reduction in emissions as included in its NDC. Climate change impact assessment is an essential tool for managing national emissions levels to conform to these reductions targets because it allows policy-makers to understand how and in what respects the projected emissions and impacts of a project would impede fulfillment of Indonesia's current NDC or Paris Agreement commitments.

While the obligations and commitments under the NDC and Paris Agreement are important steps, both the Paris Agreement and the NDC have been criticized for not being ambitious enough to deter the impending impacts of climate change. Many scientists concur that even the 1.5 or 2 degree limits committed to under Paris will be catastrophic for Indonesia.[10] Therefore, even with all of the global reduction targets in place, more action is required to protect the planet from catastrophic climate change.

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[7] United Nations Framework Convention on Climate Change, Art. 4(1)(f), available at http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf.

[8] Available at http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Indonesia/1/INDC_REPUBLIC%20OF%20INDONESIA.pdf.

[9] "LULUCF" refers to greenhouse gas emissions and removals associated with human-induced land use, land-use change, and forestry.

[10] See http://www.un.org/en/globalissues/climatechange/; http://www.thecvf.org/20-nation-forum-questions-unfccc-2-degrees-goal/ and http://www.bizcommunity.com/Article/196/508/84981.html.

3. Other Jurisdictions Require Climate Change Impact Assessment

Courts in jurisdictions, such as the United States, Australia, and South Africa, have declared that climate change considerations must be incorporated into the environmental impact assessment process.

In a recent case, *Earthlife Africa Johannesburg v the Minister of Environmental Affairs and 4 others,*[11] South Africa's North Gauteng High Court determined that climate change impacts must be comprehensively assessed as part of an environmental impact assessment for a proposed 1200MW coal-fired power station. The Court held that:

> *The effects of climate change, in the form of rising temperatures, greater water scarcity, and the increasing frequency of natural disasters pose substantial risks. Sustainable development is at the same time integrally linked with the principle of intergenerational justice requiring the state to take reasonable measures to protect the environment 'for the benefit of present and future generations' and hence adequate consideration of climate change. Short term needs must be evaluated and weighed against long-term consequences.*[12]

The Court flatly dismissed the government of South Africa's argument that it did not need to analyze climate change impacts because the domestic environmental impact assessment law lacked provisions specifically requiring such an analysis to be completed. Invoking a plain reading of the National Environmental Management Act, the Court explained:

> *[C]limate change impacts are indeed relevant factors that must be considered. The injunction to consider any pollution, environmental impacts or environmental degradation logically expects consideration of climate change. All the parties accepted in argument that the emission of GHGs from a coal-fired power station is pollution that brings about a change in the environment with adverse effects and will have such an effect in the future. All the relevant legislation and policy instruments enjoin the authorities to consider how to prevent, mitigate or remedy the environmental impacts of a project and this naturally . . . entails an assessment of the project's climate change impact and measures to avoid, reduce or remedy them.*[13]

Indonesia's law is similar, in that it broadly requires that an ANDAL contain an assessment of the environmental impacts of the activity.[14] As the *Earthlife* court concluded in South Africa, this "naturally entails" assessment of climate change impacts.

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[11] *Earthlife Africa Johannesburg v the Minister of Environmental Affairs and 4 others* (NGHC), case number: 65662/16, available at https://cer.org.za/wp-content/uploads/2017/03/Judgment-Earthlife-Thabametsi-Final-06-03-2017.pdf.

[12] *Id*. (emphasis added).

[13] *Id*., para. 78. The Court also stated: "The absence of express provision in the statute requiring a climate change impact assessment does not entail that there is no legal duty to consider climate change as a relevant consideration." *Id.*, para. 88.

[14] Article 25 of Law no. 32/2009.

The *Earthlife* court also rejected concerns raised by the government of South Africa and the project proponent that climate change impact assessment could not be conducted without explicit guidance in the law to provide clarity on what is to be expected from the process. The Court countered this argument, stating that "an environmental impact assessment process is inherently open-ended and context specific. The scoping process that precedes an environmental impact assessment provides opportunity for delineating the exercise and guidance on the nature of the climate change impacts that must be assessed and considered."[15] In addition, and as Amici explain below, there is considerable expert guidance on climate change impact assessment developed by government agencies, professional organizations, and academic institutions that is readily available to any party seeking to undertake a study.

Importantly, the Court found that without a climate change impact assessment, the government could not evaluate whether the project would be in line with South Africa's National Determined Contribution (NDC) under the Paris Agreement to the UN Framework Convention. The Court explained that: "A climate change impact assessment is necessary and relevant to ensuring that the proposed coal-fired power station fits South Africa's peak, plateau and decline trajectory as outlined in the NDC and its commitment to build cleaner and more efficient than existing power stations."[16]

More than a decade ago, the Land and Environment Court of New South Wales took up the issue of climate change impact assessment in *Gray v. The Minister for Planning and Ors*.[17] At issue was the adequacy of the environmental assessment prepared for a proposed coal mine that would produce coal for use as fuel in power stations in Australia and abroad. The environmental assessment provided an estimation of the potential greenhouse gas emissions from the coal mining, but omitted any discussion of the emissions and climate impacts of burning the coal to produce electricity.

The Land and Environment Court eloquently explained its rationale for requiring a thorough evaluation of climate change impacts, relying in part on the principle of intergenerational equity:

> *While the Court has a limited role in judicial review proceedings in that it is not to intrude on the merits of the administrative decision under challenge . . . it is apparent that there is a failure to take the principle of intergenerational equity into account by a requirement for a detailed GHG assessment in the EAR if the major component of GHG which results from the use of the coal . . . is not required to be assessed. That is a failure of a legal requirement to take into account the principle of intergenerational equity.*
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[15] Id., para. 89.
[16] *Id*., para. 90.
[17] [2006] NSWLEC 720, available at http://www.austlii.edu.au/cgi-bin/sinodisp/au/cases/nsw/NSWLEC/2006/720.html.

> *Environmental assessment is intended to enable decision makers to be properly informed about the future environmental consequences of the project before them. The environmental assessment is a prediction of what the impacts might be given that the project is yet to be built. It is not appropriate to limit the scope of the environmental assessment on the basis that GHG emissions may or may not be subject to regulation in the future whether in NSW or overseas. The fact that it is difficult to quantify an impact with precision does not mean it should not be done.*[18]

Courts in the United States have repeatedly concluded that environmental impact statements must evaluate relevant climate effects even though the U.S. law, the National Environmental Policy Act (NEPA) and its implementing regulations, do not include specific provisions addressing climate change. In a case concerning an agency's refusal to evaluate climate change considerations prior to adopting vehicle fuel economy standards, the U.S. Court of Appeals for the Ninth Circuit held: "[T]he fact that climate change is largely a global phenomenon that includes actions that are outside of [the agency's] control does not release the agency from the duty of assessing the effects of its actions on global warming within the context of other actions that also affect global warming."[19]

As courts continue to affirm the need for climate change effects to be included in environmental impact assessment, some jurisdictions have promulgated guidance for conducting climate change impact assessments. For example, the United States' Council on Environmental Quality (CEQ)[20] published, after public review and comment, a "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews."[21] The Guidance provides federal agencies direction on when and how to consider the effects of GHG emissions and climate change in their evaluation of all proposed federal actions, in accordance with the National Environmental Policy Act (NEPA) and the CEQ Regulations.[22] It requires that federal agencies consider both: (1) the potential effects of a proposed action on climate change as

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[18] *Id.*, paras. 126, 138.

[19] *Ctr. for Biol. Diversity v. Nat'l Hwy. Transp. Safety Comm'n*, 538 F.3d 1172, 1217 (9th Cir. 2008)(internal quotations omitted); see also *Border Power Plant Working Grp. v. Dep't of Energy*, 260 F. Supp. 2d 997 (S.D. Cal. 2003)(agency violated NEPA when it failed to disclose indirect carbon dioxide emissions of proposed electricity transmission lines and associated power plants).

[20] CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

[21] Published August 1, 2016 and available at https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf. On April 5, 2017, the CEQ Guidance was withdrawn by the agency "for further consideration." 82 Fed. Reg. 16,576 (April 5, 2017). However, the withdrawal notice states that it does not "does not change any law, regulation, or other legally binding requirement," which includes court decisions interpreting NEPA and declaring that agencies must fully disclose the environmental impacts of greenhouse gas emissions. Published following an extensive drafting and review process, the CEQ Guidance may still be considered an example of best practice for conducting climate change impact assessment.

[22] CEQ Guidance (2016) Introduction, page 1.

indicated by its GHG emissions; and (2) the implications of climate change (for example water scarcity) for the environmental effects of a proposed action, when addressing climate change. The Guidance:

- sets out an obligation to consider "*the ways in which a changing climate may impact the proposed action and any alternative actions, change the actions environmental effects of the lifetime of those effects, and alter the overall environmental implications of such actions*;"[23]
- requires that a GHG assessment discuss direct, indirect, and cumulative impacts analysis of a proposed action's reasonably foreseeable emissions and effects;[24]
- requires the taking into account of both the short- and long-term effects and benefits of a proposed project, based on what the agency determines is the life of a project and the duration of the generation of emissions;[25]
- instructs agencies to consider how climate change may make a resource, ecosystem, human community, or structure more susceptible to many types of impacts and lessen its resilience to other environmental impacts apart from climate change. This increase in vulnerability can exacerbate the effects of the proposed action;[26] and
- by requiring agencies to assess the implications of climate change for the proposed action, the draft Guidance enables agencies to select alternatives that are more resilient to the changing climate.

The European Union's Environmental Impact Assessment Directive contains explicit provisions requiring the direct and indirect effects of a project on climate to be taken into account. This general requirement has existed since 1985. Amendments were introduced in 2014—binding since 2017—which provide more detailed requirements. In particular:

- The criteria for determining whether an EIA should be conducted include the risk of major accidents and / or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge.
- Information included within an EIA report must include:
  - A description of factors likely to be significantly affected by the project, including climate (for example, greenhouse gas emissions and impacts relevant to climate adaptation).
  - A description of the likely significant effects of the project on the environment resulting from, inter alia, the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.

[23] CEQ Guidance (2016), page 9.
[24] CEQ Guidance (2016), page 16-17.
[25] CEQ Guidance (2016), page 18.
[26] CEQ Guidance (2016), page 21.

These requirements are spelled out in more detail in the European Commission's Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (EC Guidance),[27] which was drafted in 2013 with reference to the Environmental Impact Assessment Directive described above. The EC Guidance requires an assessment of both a project's impact on climate change (i.e. mitigation aspects) and the impact of climate change on the project and its implementation (i.e. adaptation aspects). It provides a list of key questions for identifying climate change adaptation issues, and lists the considerations that should factor into the assessment of climate change impacts on the environmental baseline, the vulnerability of built infrastructure, and adaptation opportunities.[28] The EC Guidance states that, in assessing the effects related to climate change in an EIA one must, *inter alia*:

- consider climate change scenarios at the outset including extreme climate scenarios and "big surprises";
- analyze evolving environmental baseline trends;
- take an integrated approach to planning and assessment, investigating relevant thresholds and limits;
- seek to avoid biodiversity and climate change effects from the start, before considering mitigation or compensation; and
- assess alternatives that make a difference in terms of climate change and biodiversity.[29]

The Canadian provincial government of Nova Scotia adopted a "Guide to Considering Climate Change in Environmental Assessments in Nova Scotia," in 2011.[30] The Guide observes that the EIA process (known as "environmental assessment" or "EA") in Canada is "an effective tool for climate change mitigation and adaptation planning management" and "is increasingly becoming a part of the EA process worldwide."[31]

The Guide recommends that "all projects should assess their carbon footprint; review possible options to reduce greenhouse gas emissions; and assess any impacts the project may have on carbon sinks. Similarly, all projects should identify whether or not there are potential hazards from climate change that could affect the project."[32] Most importantly, the Guide strongly urges project proponents to integrate climate change considerations into the project's EIA, rather than prepare a stand-alone climate change assessment document.[33]

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[27] Available at http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf.
[28] *See* page 10 of the EC Guidance which provides a step-by-step guide on how to assess the effect related to climate change, available at http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf.
[29] EC Guidance page 10.
[30] Available at https://novascotia.ca/nse/ea/docs/EA.Climate.Change.Guide.pdf.
[31] *Id*., p. 1.
[32] *Id*., p. 2.
[33] *Id*., p. 3.

These documents provide useful guidance and best practices for the court to consider in determining how PLTU Celukan Bawang should incorporate climate change impacts into its environmental assessment.

B. Methodology for Conducting a Climate Change Impact Assessment

An assessment of climate change impacts requires far more than simply reporting the projected greenhouse gas emissions of the project. The ANDAL for PTLU Celukan Bawang must consider several additional aspects of the relationship between the proposed project and climate change, including:

1. the project's contributions to climate change;
2. the effects of climate change on physical and operational features of the project, for example the impacts of sea level rise and storm surges on the physical integrity of the project infrastructure, including coal handling and coal ash storage facilities; and
3. how the project's impact on the environment and communities will be influenced by climate change, i.e. the ways in which climate change might exacerbate the environmental impacts of the project and the ways in which the project would increase Indonesia's vulnerability to climate change.

The Sabin Center for Climate Change Law at Columbia University has developed a set of model protocols for assessing the impacts of climate change on the built environment.[34] The model protocols recommend that the following considerations should be taken into account in assessing the impacts of climate change:

- *Future baseline: Whether climate change may influence the future baseline conditions which would exist in the absence of the proposed action (the no action alternative).*
- *Project description: Whether the project may be vulnerable to the impacts of climate change, taking into account the location of the project, the project's expected useful life, and the resilience of design features, construction materials, operational processes, and decommissioning processes.*
- *Purpose and need for project: Whether climate change may influence the need for the proposed project or the ability of the project to fulfill its intended purpose.*
- *Affected environment and resources: Whether climate change may increase the vulnerability of the affected environment and any natural and human resources that are impacted by the project.*

[34] *See* Jessica Wentz, "Assessing the Impacts of Climate Change on the Built Environment under NEPA and State EIA Laws: A Survey of Current Practices and Recommendations for Model Protocols," Sabin Center for Climate Change Law, August 2015. Available at https://web.law.columbia.edu/sites/default/files/microsites/climate-change/assessing_the_impacts_of_climate_change_on_the_built_environment_-_final.pdf.

- *Implications for the environmental consequences of the project: Whether the impacts of climate change may exacerbate the environmental consequences of the project or generate new consequences which would not have otherwise occurred.*[35]

The Sabin Center report also states that, "(d)ue to the uncertainty of the pace and magnitude of climate change, agencies should take a precautionary approach when assessing and disclosing the potential impacts of climate change: they should evaluate impacts by using multiple scenarios, including the most severe climate change projections developed by the IPCC and other authoritative bodies. The probabilities of each of the scenarios should be disclosed if they can be estimated."[36]

One of the most important components of climate change impact assessment is preparation of comprehensive baseline information that not only reflects the existing condition of the environment in the project area, but also the projected impacts of climate change to that environment. This approach is considered best practice for accurately evaluating the added climate impacts of PTLU Celukan Bawang, as well as the project's impacts to environmental conditions that may be made more vulnerable due to climate change.[37]

1. The Project's Contribution to Climate Change

It is vital that the projected GHG emissions of the project be calculated accurately and comprehensively. This requires consideration of:

- direct emissions of the project;
- indirect or full life-cycle emissions, starting from the construction and pre-operation phase of the project and extending to the end of the project's lifetime and decommissioning, and including the GHG emissions that will result from the necessary mining and transportation of coal required by the project throughout the project's lifespan;
- cumulative emissions; and
- the external costs associated with carbon emissions or "social cost" of carbon.

The Greenhouse Gas Protocol developed by the World Resource Institute (WRI) and the World Business Council on Sustainable Development (WBCSD), sets a global standard for measuring, managing, and reporting GHG emissions. This is a widely-used international accounting tool and serves as a foundation for other GHG reporting standards.[38] An alternative and reliable methodology for the calculation of the project's GHG emissions is the

[35] *Id.* at page 50.
[36] *Id.* at page 50.
[37] The Sabin Center report recommends: *"An accurate impact assessment … requires an accurate characterization of the baseline environment. To the extent that climate change may influence that baseline, it should factor into the environmental review process. This means that decision-makers should account for the impacts of climate change when describing the natural resources, ecosystems, and communities that will be affected by a project*." *Id*. at page 5.
[38] Available at http://www.ghgprotocol.org/.

Intergovernmental Panel on Climate Change's (IPCC) 2006 Guidelines for National GHG Inventories for Energy.[39]

The emissions and impacts of the project must not be assessed in isolation—consideration must also be given to the cumulative impact that the project, combined with the impacts of other GHG emitters, will have on the existing environment, infrastructure, municipal services and communities in the area. Consideration must be given to the limited "emission space" that remains for Indonesia and is needed by other sectors such as agriculture and transport. There is a limit to the amount of carbon which can still be emitted before 2°C of warming becomes inevitable. The result is that there is effectively a limit to the amount of GHGs which can be emitted, and the already limited "emission space" must be used cautiously to accommodate industries that need it. Life-sustaining industries such as agriculture, for example, require the emission space more urgently than coal power generation, particularly when renewable energy alternatives are available.

Assessment of the project's carbon footprint should also consider the external costs associated with such impacts. The United States' social cost of carbon protocol (SCC)[40] for assessing climate impacts is a tool for estimating comprehensive climate change damages. It includes, among other things: changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services - all of which climate change can degrade. Although the SCC does not currently include all of the relevant damages, it is a useful method for estimating the damages associated with even a small increase in CO2 emissions—conventionally one metric ton—in a given year, and represents the value of damages avoided for a small emission reduction (i.e. the benefit of a CO2 reduction).[41] When the U.S. Government Accountability Office reviewed the process used to develop the SCC, it reported that the protocol was consensus-based, relied on peer-reviewed literature, disclosed limitations, and was designed to incorporate new information and research.[42]

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[39] *See* Volume 2 available at http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.htm.

[40] The protocol was developed by a working group of U.S. federal agencies, including the U.S. Department of Agriculture. *See* https://www3.epa.gov/climatechange/Downloads/EPAactivities/scc-fact-sheet.pdf. An Executive Order issued in March 2017 disbanded the working group and withdrew the technical support documents that underlie the protocol. *See* Exec. Order 13,783, 82 Fed. Reg. 16,093 (March 28, 2017). The Executive Order nevertheless directs U.S. agencies to continue to "monetiz[e] the value of changes in greenhouse gas emissions" in compliance with earlier guidance, referred to as OMB Circular A-4. *Id*. The Executive Order and OMB Circular A-4 do not prohibit agencies from relying on the same data, assumptions, and models that the working group used to reach its estimates on the social cost of carbon. Therefore, the analysis in the SCC protocol should be considered a state-of-the-art approach based on the best available, peer-reviewed literature.

[41] *See* page 23 http://www.wildearthguardians.org/site/DocServer/Comments_of_HCCA_et_al_on_scoping_-_Colorado_Roadless_Ru.pdf?docID=16122.

[42] U.S. Government Accountability Office, GAO-14-663, Regulatory Impact Analysis - Social Cost of Carbon Estimates (2014), available at https://www.gao.gov/assets/670/665016.pdf.

Annex 3 of the EC Guidance, referred to above, provides for assessing a project's carbon footprint, including links to a methodology for calculating absolute and relative GHG emissions piloted by the European Investment Bank (EIB).[43]

2. The Impacts of Climate Change on the Project

The impacts associated with climate change not only threaten the global and surrounding environment, but also pose significant risks to the proposed project. The ANDAL must comprehensively disclose and evaluate possible risks to PTLU Celukan Bawang from climate change. The associated risks may entail, for example, climate-related phenomena such as flooding, drought and heat waves, which can directly impair the performance and longevity of infrastructure and buildings or compromise the integrity of coal ash disposal facilities.

As a South African court observed, coal-fired power plants "not only contribute to climate change but are also at risk from the consequences of climate change. As water scarcity increases due to climate change, this will place electricity generation at risk, as it is a highly water intensive industry."[44] As such, the Court found that a climate change impact assessment requires more than a quantification of anticipated greenhouse gas (GHG) emissions from the power station, but also an assessment of climate change impacts on "the power station itself over its lifetime" and how it "may aggravate the effects of climate change."[45]

Assessing a proposed project's resilience to climate change is widely considered best practice. For example, under EU law, an EIA should address "*the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge*", and "*the vulnerability of the project to climate change*."[46] Fiji's EIA Guidelines, 2008[47] require project applicants to consider the vulnerability of a project to natural disasters, taking into account the future impacts of climate change and sea level rise.[48] Guidance published by the provincial government of Nova Scotia strongly emphasizes:

> One of the most compelling reasons for considering climate change in [EIAs] is that climate data play a key role in the planning and design of infrastructure. Under climate change, the use of historic data alone may no longer be appropriate. Conventional uses of historic data, such as the exclusive use of climatic normals could render infrastructure vulnerable by leading to designs with insufficient load and adaptive capacity, or by leading to planning decisions that situate projects in environments that become unsafe or difficult to maintain over time.[49]

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[43] http://www.eib.org/about/documents/footprint-methodologies.htm.
[44] *Id*., para. 25.
[45] *Id*., paras. 43-44, 49.
[46] Directive 2014/52/EU (2014) para 13.
[47] Available at http://marineecologyfiji.com/marine/wp-content/uploads/2014/11/EIA-guidelines-FIji.pdf.
[48] *Id.* para. 2.5 page 72.
[49] Nova Scotia Environment, *Guide to Considering Climate Change in Environmental Assessments in Nova Scotia* (2011), pp. 1-2.

The EIA Guidance for Coal Fired Power Stations in Pakistan (IUCN)[50] elaborates usefully on this issue by identifying the coal-fired power sector's vulnerability to projected climate changes, including:

- increases in water temperature, which are likely to reduce generation efficiency, especially where water availability is also affected;
- increases in air temperature, which will reduce generation efficiency and output as well as increase customers' cooling demands, stressing the capacity of generation and grid networks;
- changes in precipitation patterns and surface water discharge, as well as an increasing frequency and/or intensity of droughts, which may reduce water availability for cooling purposes to thermal power plants; and
- extreme weather events, such as stronger and/ or more frequent storms, which can reduce the supply and potentially the quality of coal, damage generation and grid infrastructure, reduce output, and affect security of supply.[51]

Due to the location of the PLTU Celukan Bawang in Bali rising sea levels threaten the structural integrity and operation of the plant as well as maintenance of coal ash storage facilities during operation and after plant closure. At Celukan Bawang, the project site ranges from 0m to 12.5 meters (ANDAL at II-26: Peta Topografi). The elevation of the coal stock yard and ash yard are not specified. According to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, average sea levels are already 19cm higher on average than 1900 levels, and by 2100, sea level rise could accelerate and reach as high as 98cm if nothing is done to limit carbon pollution.[52] As of October 2017, current research that incorporates rates of Antarctic ice loss projects sea level rise as high as 1.32 meters by 2100,[53] further increasing the risk of coastal flooding, storm surges and rising groundwater.

Furthermore, coral reefs in north Bali are threatened by increasing sea temperatures and acidification. Loss of fringing reefs in Bali has been documented to result in severe beach erosion, even with the construction of low walls built at sea.[54] Loss of coral reefs near the project site will further expose and erode the sandy beach at the project site, subjecting the revetment wall to greater wave impacts than it is designed to withstand, potentially exposing

[50] Coutinho, Miguel and Butt, Hamza K. 2014 Available at http://cmsdata.iucn.org/downloads/niap___coal_fired_power_plants.pdf.
[51] *Id.* page 84.
[52] 5th AR: Church, J.A, et. al, 2013: *Sea Level Change*. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, p. 1139.
[53] Michael Slezak, *Sea levels to rise 1.3m unless coal power ends by 2050, report says*, The Guardian, October 26, 2017, available at https://www.theguardian.com/environment/2017/oct/26/sea-levels-to-rise-13m-unless-coal-power-ends-by-2050-report-says.
[54] T. Whitten et al., *The Ecology of Java and Bali*, Dalhousie University/Periplus Editions (1996) at 365-366.

both the coal stock yard and the ash yard to storm surges. The ANDAL must consider how these manifestations of climate change would impact the project.

3. How the Project's Impact on Bali's Environment and Communities will be affected further by Climate Change

In addition to the impacts that climate change will have on the operation and functionality of the project itself, climate change-related phenomena can increase the vulnerability of the surrounding environment (human and natural) to the environmental impacts of a project.[55] A comprehensive environmental impact assessment for PTLU Celukan Bawang must address how the project will affect Indonesia's resilience to climate change. This entails consideration of the extent to which specific components of the affected environment, namely natural systems, human systems and key resources, are vulnerable and/or resilient to the impacts of climate change.[56]

V. CONCLUSION

The Bali Governor's Decree No.660.3 / 3985 / IV-A / DISPMPT (*Environmental Permit for Development of a Steam Power Plant (PLTU) given to PT. PLTU Celukan Bawang*) was based on an ANDAL that did not consider the climate impacts of PLTU Celukan Bawang. As set forth above, Law No. 32 of 2009 requires that an ANDAL must evaluate all significant environmental impacts of a project. Courts and policy-makers around the world have interpreted similar laws to require assessment of the climate impacts of a proposed project. In the case of PLTU Celukan Bawang, emissions of CO2 and the contribution of these emissions to climate change are significant. Moreover, the location of the plant in a low-lying coastal area vulnerable to sea level rise, and the sensitivity of surrounding coral reefs and other marine resources to the impacts of climate change make assessment of the climate impacts essential to understanding the environmental risks associated with the project. The undersigned urge this Court to take notice of the best practices referenced in this submission to guide implementation of climate change impact assessment for the PLTU Celukan Bawang project.

[55] *See* https://web.law.columbia.edu/sites/default/files/microsites/climate-change/assessing_the_impacts_of_climate_change_on_the_built_environment_-_final.pdf at page i.
[56] *See* CEQ Guidance (2016), page 21-25; Sabin Center Report at 50.