PHILIPPINE SUBMISSION ON EMISSIONS AVOIDANCE

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1. INTRODUCTION:

Decisions 6 and 7 of the 4th Session of the Paris Agreement (CMA 4) and the 27th Session of the Conference of Parties of the UN Framework Convention on Climate Change (CoP 27 of the UNFCCC) mandated the preparation of a Synthesis Paper from the Submissions of country Parties on the concept and application of Emissions Avoidance (EA) as an eligible class of mitigation activities under Article 6 of the Paris Agreement.[1] This Paper is an expanded version of an earlier presentation and summary provided by the Philippines as the main proponent of the EA concept, since its introduction in CoP 25 in Madrid in 2019.

In this Submission, the Philippines will further elaborate and provide the scientific and technical moorings of the EA notion, its potential significant contribution to addressing the global warming problem and facilitating attainment of the related Sustainable Development Goals (SDGs) and increased socioeconomic development and sustainability for countries from avoided greenhouse gases. For further clarity, this paper will provide sample calculations which will exhibit how the net zero situation towards a stabilized 1.5^0 C increase in atmospheric temperature and way below 2^0 C, can be achieved on or even faster than the 2050 target timeframe.

The delivery of Overall Mitigation of Global Emissions (OMGE) could be assured by using all the mitigation opportunities available to the Parties, market, and non-market alike. GHG avoidance because of the magnitude of its effect in zeroing out the risk before it happens, offers a bigger mitigation opportunity, and can contribute significantly and fast, to the OMGE. The EA concept operationalizes the claims by developing countries to the remaining safe carbon budget that would enable the global community to achieve the goal of keeping within the Paris Agreement temperature limit target of not more than 1.5^0 C and way below the 2^0 C average global atmospheric temperature increase.

2. DEFINITION, CHARACTERIZATION, OBJECTIVES AND SCIENTIFIC/TECHNICAL/LEGAL BASIS

Emissions Avoidance, as it is proposed to be used under the Mitigation mechanisms of Article 6 of the Paris Agreement, is derived from the application of a systematic risk management approach, albeit only in two stages and two classes of mitigation actions, the other being Emissions Reduction (ER), the conventional state of application, to date. Risk, as applied here, is generally defined as the probability of a negative impact materializing from a potential source of danger[2]. It can, therefore, be considered as a trigger which can translate into varying degrees of impacts, depending on the affected

[1] Specifically, on what will constitute Internationally Transferred Mitigation Outcomes (ITMOs) and Mitigation activities also producing Sustainable Development under Articles 6.2 and 6.4 of the PA, respectively.

[2] In this case, climate hazards.

elements and mitigation strategy used. Greenhouse gases affect risk factors (e.g. heightened atmospheric temperature which intensify the negative & erratic behaviors of climate hazards, enhancing their uncertainty.) The two classes of mitigation actions have similar but differentiated degree in terms of effectiveness and impact on the global warming problem. Emissions avoidance will fully prevent the release of potential GHGs ex ante, while Emissions Reduction will only partially mitigate or lessen the amount of emissions produced. Both would result in mitigating the risks and potential damage(s), but they differ in the degree of management efficacy of the cascading risks and impacts. It goes without saying that EA will translate to zero/no additional risk while ER will still have residual risks and, therefore, result in impacts down the line.

Emissions avoidance could, therefore, be formally defined as the '*full displacement or prevention of GHG emissions expected to be generated by planned GHG emitting actions in energy, transport, manufacturing, agriculture, human induced deforestation, and other GHG emitting development activities.* Full prevention of GHGs will translate to full avoidance of impacts which aggravate global warming which translate to accelerated climate change."

The EA concept has long been embedded in the UNFCCC and lately, the Paris Agreement, to wit:

- ❖ **Article 3, paragraph 3** of the Convention which states that "The Parties should take ***precautionary measures*** to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are **threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures**, considering that policies and measures to deal with climate change should be cost-effective to ensure global benefits at the lowest possible cost."

- ❖ **The Preamble of Decision 1 CP 21 adopting the Paris Agreement** also states: "*Also recognizing* that deep reductions in global emissions will be required in order to achieve the ultimate objective of the Convention and *emphasizing* the need for urgency in addressing climate change."

Specifically, the EA was strongly advocated by the Philippines for operationalization in the negotiations for the following reasons:

- ➢ It is ***to complete the classes of GHG emitting actions that could be legitimately displaced ex ante***, by developing country Parties, the emissions of which are expected to grow with their guaranteed right to pursue socioeconomic development by whatever means.

- ➢ In the context of threat management which the Philippines understands to be the Parties' main goal under the Climate Convention and its Protocols, it is the Philippines' position that the country Parties of the UNFCCC and the Paris Agreement need ***to systematically address the global warming problem in all its potential forms and manifestations such as risks, as well as impacts***.

- ➢ Countries using risk management as a framework for crisis management know that ***prevention of adverse impacts can happen if the source of the potential threat is avoided***. If Parties have readily accepted Emissions Reduction as a class of risk management actions which will prevent the potential adverse impacts of the source of risks, Emissions Avoidance, which will thoroughly prevent a problem from taking place, should be, in fact the main choice rather than just palliative Emissions Reduction.

3. **THE DOCUMENTED EVIDENCE BASE**

The strongest justification for the immediate take up of an anticipatory/risk prevention approach under the Climate Change Convention has been recently affirmed and strongly articulated by the International Panel on Climate Change (IPCC), in its latest 6th Assessment Summary Report for Policymakers. From the IPCC analysis, GHGs in the atmosphere are still disturbingly increasing for the assessment period, 2010-2019 with CO_2 from fossils highest, followed by CH_4. Notably, fluorinated gases have the largest growth in absolute emissions from 1990.Meantime, $C0_2$ from LULUCF is characterized by large uncertainty and variability. Specifically, the analysis concluded that "Emissions reductions in CO_2 from fossil fuels and industrial processes (CO_2 -FFI), due to improvements in energy intensity of GDP and carbon intensity of energy**, have been less than emissions increase from rising global activity levels** in industry, energy supply, transport, agriculture, and buildings. (High confidence)".[3]

Further, the emissions drop in the first half of the COVID pandemic in 2020 noted in the same report is interesting, especially the conclusion that "CO_2 -FFI emissions in the first half of 1990 dropped temporarily and rebounded at the end of the year because of the COVID responses." It seems that significant rapid reduction in GHG emissions is possible globally with the immediate cessation of chronic GHG sources. The only problem is how to maintain them at levels that would not aggravate the global warming further.

What is notable is the recommendation of the IPCC in AR 6 on **Future Climate Change, Risks, and Long-Term Responses**, i.e. "deep, rapid, and sustained reductions in greenhouse gas emissions would lead to a discernible slowdown in global warming within around two decades, and also to discernible changes in atmospheric composition within a few years (*high confidence*)." Further, the IPCC's observations that "Multiple lines of evidence suggest that mitigation policies have led to 24 Gt CO_2 -eq yr-1 **of avoided global emissions *(medium confidence*)** *and that* at least 18 countries which have sustained absolute production-based GHG and consumption-based CO_2 reductions for longer than 10 years generated reductions which **have only partly offset global emissions growth** (*high confidence).*It, therefore, appears that outcomes are not time dependent but based on the mitigation strategy utilized.

The Philippines posits that the only way that deep, rapid, and sustained cuts in greenhouse gas emissions can be realized is by using means that would avoid generating GHGs fully such as renewable energy or climate benign technologies (e.g., hydrogen). These potential avoided emissions from planned[4] activities constitute the more significant mitigation potential, which when actualized or realized, proffers the real substantial and rapid solution to the global warming problem within the milestone periods as prescribed by the IPCC on the attainment of net zero no later than 2050.

[3] B.2 under Recent Development and Trends, IPCC AR6 Summary for Policymakers.
[4] As evidenced by official documents like short-, medium- and long-term plans

4. EXAMPLES OF THE EA APPLICATION FOR A SELECTED GEOGRAPHIC AREA AND SUB-SECTORS

To concretize and showcase the operationalization of the Philippine proposal, presented below are sample applications in selected mitigation sectors, namely energy generation and emissions mitigation in an industry subsector, i.e. cement production. These examples will use a combination of mitigation technologies which would fully or significantly displace emissions, starting from when they would be operationalized in 2030[5] to regular operations through 2040 and beyond.

4.1 Background Information on Sectoral/Sub-sectoral Foci and Sites

4.1.1 Sectors/Sub-Sectors

Energy

Chosen for this paper are sectors and sub-sectors that would showcase the biggest and most significant emissions mitigation displacement even before they happen and after they happen but have the opportunity to fully capture emissions, thus avoiding release into the atmosphere.

Being the biggest use and, therefore, involves the biggest potential, energy, specifically energy generation for electricity and power, is provided as an example below. The geographic setting selected for this illustration is the idyllic island of Palawan in Western Philippines fronting the West Philippine Sea. Palawan is a very important showcase of Philippine biodiversity, both inland and marine. It is also an important tourism site and source of important marine products. As an island with all of the renewable energy sources (solar, wind, ocean, hydro) it can provide a snapshot of a potential energy independent locality with a cost effective mitigation strategy as a model for the other islands of the country. The Philippines comprises 1,700 islands and excluding the biggest islands of both Luzon in the north and Mindanao in the south, all other islands can potentially use the energy independence outcome for Palawan. Provided below are the calculations for the EA potential of this island translating to its climate benign and clean energy generation.

IPPU Cement

The cement industry is a major emitter in the IPPU sector, and is projected to grow annually as demand for cement increases, led by individual house builders and boosted by the government's strong emphasis on infrastructure construction. While EA cannot take place ex ante even with the most efficient mitigation approach for this sub-sector within the manufacturing process itself because of quality implications of changes in clinker ratio, the EA application here will be applied as a carbon capture intervention. In this sense, this kind of approach (end of pipe mitigation in a closed loop system) will be applicable to other similar emission sources.

[5] Assumes a six (6) preparatory period, including design, construction and start up.

4.2 Emissions Mitigation Calculations and Projected Results

Energy

The electricity demand of Palawan was projected until 2030, and the corresponding BAU emissions were estimated using the grid emission factor (refer to Table 1). By 2030, the maximum daily load demand is projected to be 79.07 MW which corresponds to 493,343.1 GgCO_2e of emissions.

The DOE has approved a number of RE service contracts to support the province's goal to be 100% RE-powered (refer to Table 2). The combined capacity of the approved projects amounts to 71.66 MW. With the assumption that these plants are operational by 2030, a total of 447,077.6 GgCO_2e of emissions or **90.6%** of the projected emissions in 2030 are avoided.

It should be noted that 1 wind power plant and 8 solar power plants are still slotted for operation, with capacities still to be determined. The installation of these power plants should enable the province to meet its objective.

Table1: Projected Maximum Load Demand based on Population for Palawan

	2023	2024	2025	2026
Population	990,806	1,008,021	1,025,235	1,042,449
Maximum Daily Load Demand[1] (MW)	70	71.30	72.60	73.89
Annual GHG Emissions, GgCO_2e	436,721.0	444,810.1	452,898.8	460,987.8
	2027	**2028**	**2029**	**2030**
Population	1,059,663	1,076,877	1,094,091	1,111,305
Maximum Daily Load Demand[1]	75.19	76.48	77.78	79.07
Annual GHG Emissions, GgCO_2e	469,076.6	477,165.3	485,254.0	493,343.1

Notes:

1. *Includes supply reserve*
2. *Data Sources:*
    a. *Population - Philippine Statistics Authority 2000, 2010 and 2020 Census of Population and Housing, and 2015 Census of Population.*
    b. *Maximum Load Demand – Palawan Electric Cooperative (PALECO), Daily Supply and Demand Outlook a.o. March 2023 (website)*
    c. *Grid Emissions Factor 2015-2017 for Luzon-Visayas Grid – Department of Energy (website)*

Table 2: Capacity of Awarded Renewable Energy Service Contracts in Palawan

Summary (MegaWatts) based on available data – capacity	**Potential (MW)**	**Installed (MW)**	**Total (MW)**	**GHG Emissions Displaced (GgCO2e)**
Solar	26.86	1.2	28.06	175,062.8
Biomass	7	-	7	43,672.1
Hydroelectric	16.6	-	16.6	103,565.3
Wind	20	-	20	124,777.4
Sum	**70.46**	**1.2**	**71.66**	**447,077.6**

Notes:
1. *Source: List of Approved Renewable Energy Service Contracts, posted at the DOE website*

<u>IPPU – Cement Industry Emissions</u>

Emissions in the cement industry are generated from the calcination of carbonate materials. This is intrinsic in the manufacturing process and as such reducing emissions from this source is challenging. As such, the deployment of carbon capture technologies will necessarily be utilized.

The projected emissions from the cement industry are estimated based on the growth of the sector in terms of cement production (refer to Table 3). The standard industry clinker ratio and the IPCC default clinker emission factor were used to come up with the estimate. In 2030, cement production is estimated to emit 31,373.5 GgCO2e, approximately twice the emissions in 2023. This amount of emissions should be the design sequestration capacity of the carbon capture strategy to be deployed.

Table 3: Projected Emissions from the Cement Industry

	2023	**2024**	**2025**	**2026**
Annual Cement Production, tonnes	40,568,659	44,395,616	48,594,795	53,237,959
Annual GHG Emissions, Gg CO2e	16,465.2	18,018.4	19,722.7	21,607.2
	2027	**2028**	**2029**	**2030**
Annual Cement Production, tonnes	58,369,675	64,039,370	70,321,546	77,301,185
Annual GHG Emissions, Gg CO2e	23,689.9	25,991.0	28,540.7	31,373.5

Source: DENR model for Cement Industry Emissions (2022)

5. CONCLUSIONS AND WAY FORWARD

The above sample calculations provide a limited snapshot of the magnitude of the potential positive impact of the EA application on the global warming problem. If applied on a wider scale by developing countries which have significant mitigation potential from their guaranteed right to emit, the prognosis of the IPCC of "deep, rapid, and sustained reductions in greenhouse gas emissions leading to a discernible slowdown in global warming within around two decades" is achievable. Moreover, this ensures that the globally accepted framework of risk management of the source can be applied, providing predictability of result cost effectiveness.

However, the operationalization of the EA proposal, outside of the market mechanisms of Article 6 of the PA, is highly dependent on the flow of the Means of Implementation (finance, including for technology transfer, diffusion and development and capacity development). The extent and breadth of the latter scenario will, however, provide a bigger probability of effectiveness of the projected interventions.

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