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I've been asked to share my thoughts on what an environmentally resilient Philippines could look like. To understand what this involves, let me take a step back and place it in the context of what the world needs to get to and why.

It's often said that the COVID-19 pandemic was just a dress rehearsal for how we will face an even more perilous world from the impacts of climate change. The overriding goal is to "solve climate change"— which means mitigating it as well as adapting to its impacts that are already here, with more yet to come. Because if we don't get it right, the exponential deterioration of global climate systems and the environment will make it impossible to solve other problems like poverty, inequality, disease, food production, freshwater scarcity, mass migration, social displacement, mass extinction of species and biodiversity loss, among others. All of these we will feel during our lifetimes.

Paris Conference of Parties (COP) 21 applauded the agreements that signaled we could limit global warming to 2.0 degrees Celsius if all commitments were met. Since then, the IPCC issued in October 2018 a special report on the impacts of Global Warming of 1.5 degrees Celsius, followed last year and this year by its Sixth Assessment Reports from working Groups I, II and III, all with dire warnings and consequences for a 2-degrees Celsius warmer world.

Taken together, they underscored the scientific consensus that our targets must not exceed 1.5 degrees by the end of the century. Consequently, "Solving Climate Change" means:

Phase 1) We reduce greenhouse gas (GHG) emissions (of carbon dioxide, methane, nitrous oxides and fluorinated gases) from the current 50 gigatons (Gt) of GHG's per year. (Emissions peak by 2025).

Phase 2) Eliminate all emissions of GHG's (Get to Net Zero emissions by 2050.)

Phase 3) By 2050, begin the arduous task of reducing the concentration of GHG in the atmosphere (net negative emissions). This is best described in the words of NASA climate scientist James Hansen: "If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted…CO2 will need to be reduced…to at most 350ppm."

For reference, pre-industrialization levels were at 280 parts per million (ppm) and we sailed past 350ppm in 1986. We continued to blow through 400ppm in 2013, the same year Super Typhoon Yolanda, the most powerful typhoon on earth to ever make landfall, announced to the world through the suffering of millions of Filipinos that climate change is here and that we better get our acts together now.

We now need to realize phases 1, 2 and 3 within the rapidly diminishing timeframe of the next 28 years. Failing to do this over the timeframe will trigger irreversible tipping points, the effects of which we are already seeing in news reports from all over the world every day. Progress through Phases 1 to 3 in the battle to "solve climate change" has many facets beyond just energy (it spans agricultural practices, food production, waste management practices, industrial processes,

deforestation, f-gases used in refrigeration and many others).

For now, let me just focus on what the foundations to the global energy transition will look like as it's important that we appreciate what the transition to net zero demands:

Cornerstone 1 : Reduce carbon intensity of electricity. Clean-up the electricity grid's generation sources with the intent of progressively lowering carbon intensity per kwh. We must keep in mind that as we do this, we need to keep the lights on and keep power prices affordable.

Cornerstone 2 : Scale up energy efficiency efforts. Scale up energy efficiency as the "first fuel" and encourage and incentivize its use everywhere.

Cornerstone 3 : "Electrifying everything." With a greener grid you should now seek to "electrify everything" from transport to various industrial processes where possible. Innovation in the transport and industrial sectors that accomplishes this is crucial for this cornerstone too.

Cornerstone 4 : Use carbon-neutral fuels for hard-to-reach sectors. With a green grid there will now be the possibility of producing carbon-neutral fuels like green hydrogen and green ammonia for industrial processes and transport sectors (such as long distance trucking, shipping and aviation) that cannot be electrified by 2050. This as the technology matures and gets cheaper during this period.

Cornerstone 5 : Deploy carbon capture use and storage (CCUS). A zero-emissions grid will be a critical component for deeper deployment of electricity-run Carbon Capture and Sequestration technology to arrest more emissions from other hard-to-reach sectors. Innovation in CCUS technology is also expected to accelerate in the coming decades. Eventually post 2050, these are envisioned to be deployed at scale in Phase 3 to get the world to net negative emissions and atmospheric carbon concentrations back to the deemed safe levels of 350ppm.

The global energy transition appears straightforward when viewed from its five cornerstones. However, they have immense implications for the central role of the electricity grid. The most important point is that by 2050 we will need five times the electricity we use today; and we will need 10 to 12 times the clean energy in use today. Even as we do this, we must continue to improve access to 24/7 electricity for billions of people (in the case of the Philippines, millions of households) who currently do not have it reliably in their lives if we are to even begin uplifting them from poverty.

Decarbonizing and scaling up a green electricity grid over the next three decades is probably the greatest energy transition in the history of mankind. It's not just changing the electricity system but building a new global energy system with components we have never built before and at a massive scale. This will need nothing short of collaborative action among various players that today often consider themselves competitors. And this also needs well-coordinated and timely action on the part of leaders, policymakers and regulators who must be decisive and well-versed on the elements that make for a successful and just energy transition.

You may ask why the Philippines should undertake this energy transition given our limited resources and the fact that we account for only 0.4 percent of global emissions. I would answer that in this way: it's apparent that the world is changing, not as fast as it needs to yet, but eventually it will, and it must.

The impacts of the climate crisis as well as climate action that will be demanded of everyone are among the forces in history which will transpire "gradually and then suddenly". Global finance, supply chains, service providers, employees and consumers will reflect this. If we're not prepared and conveniently kick the can down the road, we'll be overwhelmed and not recognize the world around us in the coming thirty years.

The science tells us we no longer have a choice. Unless we have more of these pandemics that choke growth, there will no longer be any time extensions. Since we have limited resources, we must choose to spend it judiciously and in a future-proof manner. The earlier we build on these five cornerstones of the energy transition, the better positioned our country will be for the massive change that's coming. The last point I'd like to leave you with is something I remember Al Gore saying in 2016 at the Climate Reality Project leadership training at Sofitel Manila. He said: "All our infrastructure was built for a world that's now changed".

At 1.2 degrees Celsius of warming, where we are today, the world has already changed, but it will be more so even as we successfully navigate the journey to limiting warming to 1.5 degrees Celsius. Warmer global temperatures have multiple knock-on effects on the global climate system that were stable as we know it for thousands of years. That's all changing now. We should begin by understanding what the science is telling us to prepare for and how it will affect each of us locally — stronger typhoons, higher rainfall, flooding, longer drier summers, freshwater shortages, wildfires, more mosquito-borne diseases, sea-level rise and more violent storm surges, etc.

With 60 percent of Filipinos living in coastal areas, sea-level rise is a major threat. This is compounded by the fact that land subsidence is widespread given the overextraction of our freshwater aquifers. Sea level rise will be uneven throughout the world and even locally. Not only will this threaten coastal infrastructure, cities and communities with storm surges but will also affect freshwater aquifers even more with seawater intrusion.

Temperatures on the planet are rising fastest at the poles. This will have grave consequences for sea-level rise here as tipping points are triggered in the world's cryosphere. A chart from the book Vanishing Ice by Vivien Gornitz gives you a sense of the kind of fire we're playing with. (The last time carbon dioxide concentrations in the atmosphere were at 417 ppm was in the Pliocene epoch 3-5 million years ago, average temperatures were 3-4 degrees warmer than today and 10 degrees warmer at the poles. Consequently, sea levels were 5-40 meters higher than they are today.)

Almost every major developed city has climate change action plans. Tokyo has its network of underground tunnels and cathedral-sized cisterns that can divert flooding with high-speed pumps that can empty a 50-meter Olympic-sized pool in 6 seconds flat. They originally built for rains of 55 millimeters (mm) per hour but are now upping this standard for new flood control projects to 65-75mm per hour. Malaysia has its famous 9.7-kilometer SMART Tunnel that converts an underground roadway into a flood diversion tunnel when needed. London has its famous Thames barrier that protects London from similar flooding events. I've heard of similar projects being planned for Singapore, New York, Boston, and other major cities around the world.

We need a comprehensive, coherent, and well-studied national decarbonization and adaptation plan, backed by continuous feedback that engages with what the science is telling us we should prepare for. This in turn, should be mirrored in all succeeding Philippine Development Plans and budget appropriations and relentlessly executed. We have very little time.

Try as we might to solve many of our sustainable development goals, it will be futile if we don't build for the resilience we need, and if we don't collaborate locally and as a global community to decisively "solve climate change". Having a credible vision and a dynamically executed plan is the most effective way to attract the scale of investment and funding we need to build a resilient Philippines in "a world that's now changed".

The author is First Philippine Holdings chairman and CEO. He is also the chairman of the Oscar M Lopez Centre for Climate Change Adaptation and Disaster Risk Management Foundation, and Sikat Solar Challenge Foundation.