

Why Have We Not Gone Offshore Yet?

The OSW Subsector Situation in the Philippines

JULY 2024

Rodolfo T. Azanza, Jr.



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By Rodolfo T. Azanza, Jr. ^{1/}

This is an update to the paper written in September 2023 as a commentary and an avenue to give insights into the development of the offshore wind (OSW) subsector of the Renewable Energy (RE) sector of the Philippines. The updates are mainly as gathered from the ACEF 2024 event, wherein the Department of Energy (DOE) of the Philippines participated and revealed some fresh information.

DOE revealed that for the Philippines, the latest targets are: 5% energy savings from oil products and electricity by 2040, 10% electric vehicle penetration by 2040. Adapting advance and interoperable ICT for energy, resilient and climate proof energy infrastructure, and most importantly 50% RE in the generation mix by 2040. Based on the current demand, DOE is targeting a total of 52.8 GW of RE, broken down as follows: Solar - 27 GW; Wind - 16.6 GW; Hydro – 6 GW; Geothermal - 2.5 GW; and Biomass - 360 MW.

In the current Philippine Energy Plan, there are 4 energy transition strategies being pursued. First of which is accelerating renewable investments. Second is the transmission, with aspirations to build what is called smart and green grid, which will basically double the amount of transmission infrastructure in the country today. Third, DOE is targeting offshore wind as the largest RE source in the country and with that end, the need to develop offshore wind ports. The fourth strategy is the voluntary early retirement of coal power plants (the portfolio is 58 coal power plants, about 3.8 GW of which are more than 20 years old).

For RE, DOE is looking at a total investment of 20-30 Trillion Pesos. A total of 1,300 RE service contracts have been awarded, for a prospective 135 GW of RE by 2040. However, many of these developers are able to do only up to pre-development stage and not able to continue with the development, due to lack of access to financing, among others. The local banking sector needs more encouragement to engage in RE investments. DOE cited that a study funded by Rockefeller Foundation that shows that the local banks are very liquid enough to actually finance 2/3 of the RE transition requirements but they need an industry leader who will help them understand the risks and rewards of investing in RE.

DEVELOPMENT POTENTIAL

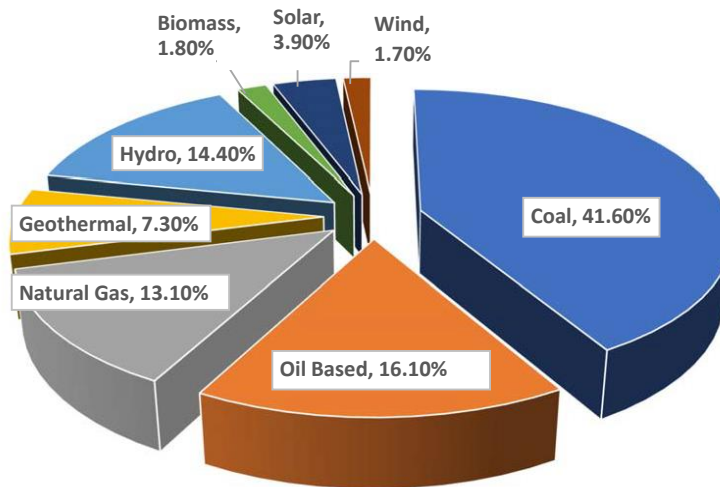
The World Bank (WB) has estimated that OSW potential in the Philippines is north of 178 gigawatts or GW (18 GW fixed and 160 GW floating) – about six (6) times of the country's overall current generation capacity of about 27 GW. The current generation mix is comprised mostly of fossil fuels with coal dominating the country's supply of energy at about 42%, while RE sources merely consist of about 30% with wind as the smallest at only 1.7%.

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Philippines Generation Mix, 2020

INCREASING DEMAND FOR ELECTRICITY

The Covid 19 lockdown created an artificial decrease in demand for electricity. But as we bottom out, the upswing of electricity demand back to the original expected level in 2020 is now evident. The outstripping of the supply by the demand for electricity is a reality again, thus the pressure on government to ripen the OSW subsector is back with a vengeance.

ONGOING COLLABORATION AND COLLECTIVE EFFORT

To step up on the OSW efforts, the Department of Energy (DOE) held a series of stakeholders' engagements from government and the private sector to come up with a list of necessary permits, licenses, and registration requirements, among others.

The DOE also enjoys the support and collaboration of an umbrella organization composed of RE associations in the Philippines called the Developers of Renewable Energy for Advancement, Inc. (DREAM), which unifies all RE industry associations, and provides them with a broader platform to advance the cause of RE mainly through policy advocacy and knowledge sharing.

The DOE is now looking at upgrading its current one-stop shop system for applying licenses for all energy projects called the EVOSS or the Energy Virtual One Stop Shop. The EVOSS is an online platform that provides a single decision-making portal for applications of permits necessary for, or related to, power generation, transmission, and distribution projects. The enhancement of the EVOSS is necessary as there are permits and licenses required from several government agencies that regulate activities over areas that may be directly or indirectly affected by OSW, which were previously not included when EVOSS is limited to land-based energy projects. As the list of involved agencies grows, the effort to streamline processes and approvals all the more becomes evident.

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THE ROADMAP

The DOE, in collaboration with the World Bank Group (WBG), has also now prepared a “Roadmap” for OSW development. The WBG commissioned a UK firm, BVGAssociates, to conduct the road map study, which was completed in April 2022, and identified suitable sites for OSW, developed strategies to integrate OSW power into the RE portfolio of the country, and propose policy measures to make it attractive to investors.

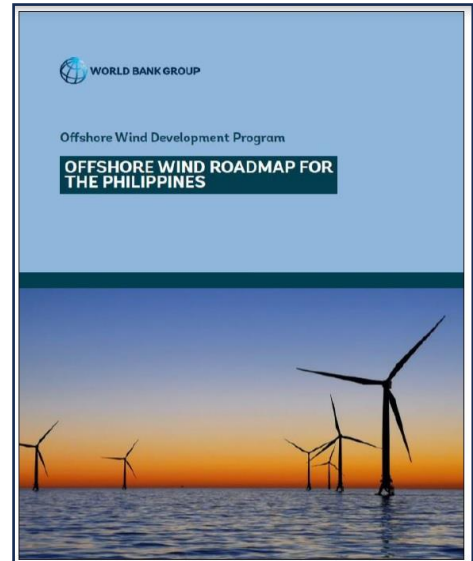
The roadmap identified the coasts of Ilocos Norte and Cagayan provinces, northern and southern coast of Mindoro Island and Metro Manila area (all in Luzon Island) as suitable for floating wind turbines, although we may take note that the Manila Bay and other areas in its vicinity may be viable for fixed-bottom configurations. The shallower coasts of Guimaras Strait in the Visayas Region are also suited for fixed-bottom OSW turbines.

Additionally, a group of students at the University of the Philippines (UP) – Marine Science and Engineering looked into the potential of OSW in the Philippines and came up with the an exclusion criteria in order to give direction to the effort to pinpoint the best potential areas for OSW. The exclusion criteria are:

- a. active submerged cable paths
- b. local ferry routes
- c. marine conservation areas
- d. coral reefs
- e. oil and gas extraction areas
- f. bathymetry/depth (which could be hurdled by further development in technology)
- g. distance from grid (which could change as the grid further develops)
- h. typhoon paths, and
- i. fault lines/earthquake prone areas

Based on the foregoing criteria, the UP students identified north of Cagayan (Luzon), west of Rizal (Luzon), north of Camarines Sur (Luzon), north of Samar (Visayas), southwest of Masbate (Luzon), Dinagat Island (Mindanao), Guimaras (Visayas), and northeast of Palawan (Luzon) as the viable sites for OSW.

Additional considerations may also be added to the criteria, such as other domestic cargo shipping routes beyond the passenger ferries, and geopolitically sensitive areas where an OSW development might trigger a cultural concern, a political boundary dispute, and so on.



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THERE IS AN INCENTIVE SYSTEM

OSW projects in the future will also enjoy the same incentives intended for RE projects. Under the Renewable Energy Act of 2008 (Republic Act 9513), corporations engaged in RE development are entitled to various fiscal and non-fiscal incentives, which we will no longer elaborate too much here as this has been already tackled in Norconsult's previous Energy Sector documents prepared for and in behalf of the Norwegian Embassy in Manila from 2016-2020.

Now, if there is potential, there is demand, there is collective effort, there is a roadmap, and there is an incentive system, so...

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The answer is manifold. And most of them can be gleaned from the event held jointly by the British Embassy Manila & Royal Norwegian Embassy Manila in collaboration with Singapore-based Global Wind Energy Council (GWEC). Dubbed as the "Joint Offshore Wind Workshop" it was held on 5 and 6 September 2023 in Ortigas Centre in Metro Manila.

According to DOE-REMB Director Marissa Cerezo, The National RE Program 2020-2040 sets a target of at least 35% RE Share in the power generation mix by 2030 and aspires to increase the RE Share to 50% by 2040. And the OSW sub-sector is being looked at as a major contributor to the achievement of these aspirations. Just to be clear about what kind of capex are we looking at in order to transition into a full RE regime, according to Reactive Technologies, Inc., New Zealand had to put up US\$1.2B to go from 82% to 100%, Queensland, Australia needs US\$12.2B over 4-years to reach its 2030 target, and Malaysia is looking at a capex of US\$375B to reach its 2050 target.

To reach our own Philippine RE target, a total of 52,826 MW additional RE capacity is needed by 2040, which is more than six times the current level of 8,255 MW. There are now 77 OSW service contracts issued by DOE with a potential aggregate installed capacity of 60.6 GW. An update was recently presented by DOE, now the figures are: 80 OSW service contracts, and they account for 65 GW.

On 15 November 2022, the DOE issued DC No. DC2022-11-0034, Prescribing Amendments to Section 19 of DC No. 2009-05-0008 titled, Rules and Regulations Implementing RA No. 9513 in order to ease up foreign ownership limitations for RE projects. This is DOE leading the charge despite possible ramifications in the future surrounding the legal question of whether a Department of Justice (DOJ) Opinion is sufficient to be fully effective in amending the prevailing law on foreign ownership restrictions, which is the antiquated Public Services Act. Nevertheless, DOE has walked the talk by awarding three OSW contracts to 100% foreign developers. The first 100% foreign-owned company (CIP) is investing 5 billion US dollars in these three (3) offshore wind projects; and there have been other foreign companies that have taken interest to follow CIP's lead. So it is good for the Philippines, because we are getting these new investments in RE, from countries where the offshore wind has been implemented successfully, and so these investors have the right track record and experience.

All these, and yet OSW has not left the coast. Why?

On April 19, 2023, President Ferdinand Marcos Jr. issued Executive Order No. 21 "Directing the Establishment of the Policy and Administrative Framework for Offshore Wind Development". This is a

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major step in the OSW policy regime. The objectives, which were rather a clear conveyance of urgency, are as follows:

1. Issuance of Implementing Guidelines on or before 19 May 2023
2. Issuance of a Policy and Administrative Framework for the efficient and optimal development of OSW resources on or before 18 June 2023
3. Submission of Permitting Agencies to DOE of the complete list of appropriate permits, requirements, procedures and corresponding fees on or before 18 June 2023
4. Rationalize and integrate the processes and requirements of all appropriate permits to the EVOSS System
5. Timely development of the needed grid interconnection facilities

The Implementing Guidelines was issued by DOE right on target, which provided specific guidelines for “OSW Development Activities and other Infrastructure Requirements, Policy and Administrative Framework, Permits for OSW Development Activities, Rationalization of Fees, and Whole-of-Government Approach.” The “Policy and Administrative Framework for Offshore Wind Development in the Country” or the “OPAF” was also issued by 16 June 2023. The integration of all permits and requirements into the EVOSS has also been actively pursued by the DOE in collaboration with the other government agencies.

But there is still a good list of hurdles that need to be addressed, as follows:

Supply Chain to Support OSW Developers

While OSW developers seem to be quite avid as to how the Philippines will get into the groove, the ability of service providers to supply the necessary services to these developers seems to be globally meager. Survey vessels for one are scarce. Installation tonnage is also in short supply.

Ports Infrastructure

One of the hurdles of OSW development in the Philippines is the availability of proper ports that can handle fabrication and assembly of OSW turbines. While ports managed by the Philippine Ports Authority (PPA), are far and wide all over the archipelago, none is currently equipped to be a proper jump-off for OSW projects. In the last ACEF in June 2024, DOE manifested that the Philippine government is now aware that the ports in the Philippines are not offshore wind-ready and investments will have to be done if we are to move the OSW subsector forward.

In the past, it was identified that some seven (7) ports (6 in Luzon and 1 in Visayas) can be marshaling ports for OSW projects. But the PPA itself, during the joint event, admitted to still needing to invest heavily on upgrading to be able to meet all the technical requirements. Their current efforts are towards climate proofing their major ports.

In the Joint Workshop, PPA revealed that:

- The 10 Major ports under PPA mentioned earlier are mostly under leased and operations contract.

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- The port facility for an Offshore Wind (OSW) needs to be designed to certain parameters to accommodate the loading/unloading of immense structures or equipment which translates to significant investment cost.
- Based on the port requirements submitted to PPA by DOE, it can be established that there is no port under the Administrative Jurisdiction of PPA that satisfies the port requirements being called for Offshore Wind (OSW) facility.

The PPA is aware that the port facility for OSW will require investment, which the operating budget of PPA will not be able to hurdle. It has suggested BOT or PPP schemes to deal with the concern.

On the other hand, it is hoped (by me, among others) that someone would raise the matter of including the OSW requirements in any major ports upgrading program that the national government might be contemplating as ODA-financed undertaking/s. I am more inclined to believe that a “Field of Dreams” type of approach will be more applicable. As the character played by Kevin Costner said, “If we build it, they will come.” So, we have to build it first.

I am personally a bit skeptical about a BOT or PPP approach, for lack of clarity on the revenue inflows that a BOT/PPP investor could consider. Direct collaboration with private OSW developers might also make sense, by dangling some good old-fashioned carrots. Otherwise, when has it ever been effective for the cart to be asked to pull the cow?



Port of Batangas, operated by Asian Terminals Incorporated (ATI)

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Marine Traffic Management

In this area, capacity-building is needed by the Philippine Coast Guard (PCG), MARINA, PPA and the local government units. Apparently, there are systems in place today, but there is little, if any, enforcement.

Grid Connection

Another major challenge is the grid. It is an ever-looming question if the grid will be able to absorb the potential generating capacities of OSWs. Grid development will have to be forward-looking, and should imbibe the current locations of the best potential OSW areas and the potential installed capacities in its long-term development plan. New substations might also have to be established to ensure that power brought from OSWs will have proper connection points when they hit land.

The National Grid Corporation of the Philippines (NGCP) has embarked on a grid planning exercise to look into how the grid can be expanded or enhanced by considering the coming online of new projects under what is called the competitive renewable energy zones or CREZ. But OSW is not yet part of the CREZ. So, the grid planning exercise needs to be revisited, and fast.

There is also an interesting piece of technical information highlighted at the joint workshop, it is the fact that inertia and systems strength (and therefore network stability) decreases with increased renewables penetration in the grid. So, there will be a plethora of new costs and concerns that the grid has to deal with in order to stabilize it anew, such as synchronous condensers, batteries, generation standby and in some cases, curtailment. To a layman like me, this means that dumping a large amount of OSW generated electricity would weaken the stability. While Battery Energy Storage Systems (BESS) are now proliferating to help stabilize the grid, adding OSW to the energy mix can mean that this strategy needs to be reconsidered or re-scaled. Thus, technologies that would allow for better capturing of grid data for analytics of grid stability will also become very important.

As a consequence, for the system operator (SO), it was highlighted that the following would have to be prepared for:

1. Increased flexibility in day-ahead market
2. Increased volume of reserves
3. Solutions to maintain system stability
4. IT-development to automate manual processes

During the last ACEF event in the Asian Development Bank (ADB), DOE Usec. Rowena Guevara presented that the current grid system is able to support about 28 GW of generation but in order to move the targeted 52.8 GW of renewable energy by 2040, the country has to almost double its transmission system. The investment required will almost be equivalent to the cost of the current transmission system today and to that end, DOE and NGCP are encountering problems, such as permitting issues, ECC requirements for environment and many other things on the government side. Usec. Guevara gave a strong indication on how serious government is in hurdling these issues, with currently four (4) DOE Undersecretaries dealing with figuring out how to help NGCP get the ROW and get all transmission projects on track.

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In 2024, three (3) major projects have been accomplished by NGCP: the Mindanao-Visayas Interconnection Project (MVIP), the Cebu-Negros-Panay Project and the Hermosa-San Jose Project. All of which will help the country's renewable energy systems.

EIS for OSW

The Department of Environment and Natural Resources (DENR) has revised their Procedural Manual for DENR Administrative Order No.30 Series of 2003 which provides for the Implementing Rules and Regulations of Presidential Decree No. 1586, the law that established the Philippine Environmental Impact Statement System. This was pursued with the support of the Asian Development Bank to address environmental regulations and related changes required for OSW and was focused on performing a gap analysis and learning from examples of good international industry practices. Personally, I believe that this should not be a big hurdle for DENR, as there are lessons from the oil and gas sector in the Philippines that can be transposed to OSW. The EIA/EIS system can be tweaked/upgraded to cover sea/ocean-related concerns such coral reefs, breeding grounds and other protected areas, effects on migratory birds, and so on. Moreover, DENR should expand its risk analysis to cover new environmental risks such as possible contaminants from the facilities, etc. The ADB-assisted activity also highlighted that DENR needs to embark on a marine spatial planning, with other related agencies.

DOE mentioned in the ACEF 2024 that DENR is just coming up with the environment clearance requirements for OSW and there is a constant dialogue between DENR and DOE. For example, DENR's policies for a pre-development for ECC was so restrictive but has progressed after DOE explained what pre-development looks like for an offshore wind, which is a rather simple exercise.

Skills Development

In the joint workshop, the question of need and ability of the Filipino technical workforce to retool themselves in order that their technical skills and experience in other RE subsectors may be applied laterally to OSW, was discussed. It appears that there may be a bit of work and investments that need to be done, especially by using innovative technologies such as simulators, AI, etc., but this is not a big hurdle, and the learning curve is not deemed steep. There are bigger challenges to bring the OSW subsector to investment readiness, and skills development is not a dealbreaker. Besides there are active private entities in the Philippines that are equipped towards proper skills training such the Norwegian Training Center Manila (NTCM), Kongsberg, etc. Nevertheless, the investment in skills-identification, gap-analysis and training will need to be done swiftly, as this can also be a source of overseas employment for Filipinos.

Financial Viability

OSW developers are looking at earning a profit at the end of the day. But as a new technology, the development of an OSW project is still expensive on a per MW basis as compared to its land-based counterpart and other RE fuel types. There is no more FIT regime in the Philippines, and the Green Energy Auction Program (GEAP) is instituted in lieu of the FIT system. It is a competitive bidding process aimed at encouraging RE developers to actively participate in the development of RE systems. DOE Circular No. DC2021-11-0036 promulgated the GEAP Guiding Principles and has been utilize by the DOE in the past year or so. GEAP bid winners do not enjoy any power purchase agreement/power supply

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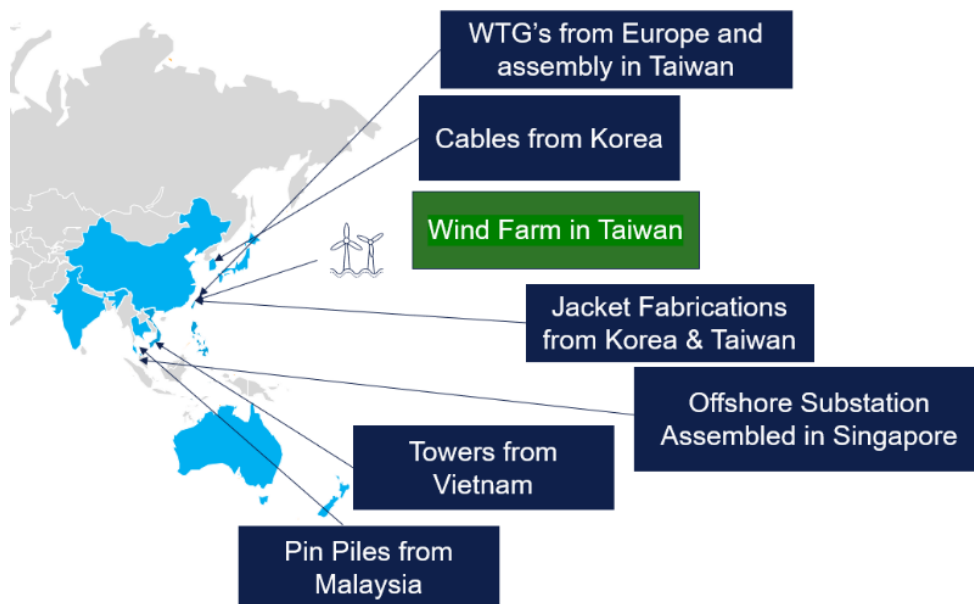
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agreement with any distribution utilities or end-users, but are ensured of full recovery of prudent and reasonable economic costs incurred (assuming that their bid offers reflect their true prudent and reasonable economic costs).

The government is also looking at the Contract for Difference (CfD) approach in order to incentivize OSW investors in regard of recovering their full costs and earning a decent profit on top. This is not a newly invented version of a wheel, but rather something that has already been used in Europe and other places. The concept is rather simple. Generators receive (or pay back) a sum of money per Megawatt-hour (MWh) value based on the difference between a wholesale market reference price and the pre-agreed strike price. In one example presented during the joint workshop, a counterparty in CfD arrangement is the Low Carbon Contracts Company (LCCC), Independent, non-profit, private limited companies owned by the Secretary of State for the Department of Energy Security & Net Zero (DESNZ). It was not clarified if all contracts signed by LCCC as counterparty has an effect of a sovereign guarantee. I would suspect that OSW developers might ask for a sovereign guarantee type of arrangement for any CfD contracts that might be implemented in the Philippines.

Further Collaboration

There now exists a Philippines Offshore Wind Joint-Industry Programme (POWJIP). The POWJIP Steering Committee is co-chaired by the DOE and Carbon Trust and comprises of 16 local and international developers and two tier-1 suppliers. The aim is to accelerate offshore wind development in Philippines by conducting impactful research that resolves barriers to offshore wind and build capacity with offshore wind sector participants in the Philippines and raise awareness of the opportunity it presents to Philippine economy and people. This should be supported and allowed to gain traction, while also looking into the synergies between and among the players. An interesting example was mentioned by DNV as illustrated below:



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HSE in OSW

During the workshop, ERM presented data taken from 2022 G+ Global Offshore Wind incident data report:

- In 2022 offshore wind experienced 210 high-potential incidents with the possibility of death or life-changing injury - up 10% from 2021
- The 2022 total recordable injury frequency rate (TRIFR) was 2.82 per million hours worked a decreasing from 3.28 in 2021. Likewise lost time injury frequency rate (LTIFR) decreased from 1.55 in 2021 to 1.03 in 2022

The first point above is alarming; the second is indicative of HSE improvements.

According to ERM, a proactive approach to EHS risk management should improve risk visibility by identifying "hidden risks" within the organization, reduce costs by dealing with business threats before they arise, rather than allowing them to develop into bigger problems, make informed decisions based on quantitative risk data, rather than guesswork or a "gut feeling," demonstrate compliance and continuous improvement in relation to current and future regulations, increase shareholder confidence by lowering the company's risk profile, and gain a competitive advantage by operating efficiently.

To be more prepared for the OSW projects that were about to be pursued, the availability of relevant trainings is needed. Today, Denmark-based -Global Wind Organization (GWO) trainings are a common standard requirement for offshore operations. We recommend looking at their website (<https://www.globalwindsafety.org>) for more information about their work and their standards.

Disaster Risk Preparedness

Vissim presented a concept that deals with emergency response using a very innovative solution, known as an Ocean Space Awareness System. It involves a system for monitoring, analyzing, and managing shipping and marine activity through coastal waters and Exclusive Economic Zone (EEZ). Data is acquired from strategically located coastal stations and processed/displayed at a central monitoring center. A vessel and object tracking paired with two-way audio communication provides the backbone of the digital ocean.

Such a system, which is operational in many littoral nations already, can be implemented in the Philippines under the aegis of the Philippine Coast Guard (PCG), with support from DoTr and MARINA. It will enable better emergency response, better monitoring of our ocean resources, and will help drive our domestic maritime industry towards the ambitions set by MARINA for the next decade.

In the joint workshop, the PCG representative discussed its role in cases of oil spills, and their inspection and monitoring mandate over vessels, which could, by way of a properly improved policy, could be made to extend over OSW installations. The PCG has apparently an ongoing active rationalization of its current mandate precisely to look into this.

Government should also rationalize the current roles of the National Disaster Risk Reduction Management Council, which is an inter-agency mechanism led by the Department of National Defense (DND), and its Technical Secretariat, the Office of Civil Defense (OCD). The current structure is such that

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the NDRRMC has a working structure at the national and regional level through the OCD offices, but below that, the provincial, municipal and city disaster risk reduction management offices (DRRMOs) are under the Local Government Units (LGUs). One of the things I imagine would need to be developed is a policy that would make major infrastructure and installations in a locality part of the local DRRMO meetings and crafting of plans.

Local Government Units (LGUs)

The Philippines has about 16,000 local government units, and each one may have their own policy, their own processes, their requirements, their fees. OSW developers will have to deal with LGUs that geographically control the project sites. And since offshore wind projects tend to be huge area-wise, developers therefore may have to deal with more than one LGU. There had been instances in the past wherein LGUs have issues among themselves when it comes to land-based boundaries. It could be more complicated for offshore project sites.

CONCLUSION

OSW in the Philippines is both feasible, relevant and needed. We do not want to encumber our limited land-resources with endless arrays of solar-cells, limiting our ability to produce food. Solar-cells also offer little in terms of local industrial development. Instead, we want to see offshore wind-resources tapped to support our growing economy. Large parts of these structures can be built locally, and our marine skills have been in evidence for centuries.

OSW supports our energy-plans, our industrial growth, the protection of our farmlands and our green transition. We think this as a question of when, and no longer a question of if.

There are a few more things that government needs to do in order to get the OSW subsector up and about, and ready for actual investments. Many developers have their sights on how government will move forward with the several concerns discussed above, while they also keep an eye for how our neighbors are getting their OSW house in order. DOE seems to be progressing well, with the very energetic Usec. Guevara leading the charge. In ports development for example, DOE is clearly aware that we need an offshore wind port by 2026, and to that end, DOE is collaborating in a multi-agency effort to invest in offshore wind ports by 2025 and deliver these ports ready for use by OSW developers by 2026. For NGCP's grid impact study, what used to take 1.5 years just to line up for the system impact study, DOE pushed and got a very good result. Now it just 60 days to line up and another 60 days of processing/study completion.

DOE is also planning to include in the green energy auction by 2025, which will hopefully help developers achieve financial closure in 2025, and will surely make the light brighter at the end of the tunnel in regard of the aspiration to see the first OSW KWh by 2028. Exciting times for OSW in the Philippines.

An as NTC Manila Managing Director Jo Even Tomren said at the joint workshop, "This is some sort of a race, so the Philippines has to work fast."

The author thanks PNBC President Carl Martin Faannessen for some very important inputs to this paper.