**Back in July 2021 I made a video looking at floating offshore wind turbines, and quite a few viewers suggested that, you know, while we’re out there getting wet and cold and miserable and everything, why don’t we really capitalise on the energy available and build wave power into each individual turbine so we could harvest power from above and below the surface.**

**Now, I must admit, my response at the time was that, although it sounded like a very good piece of lateral thinking, it was unlikely that the economics and logistics would stack up well enough to make it a viable option.**

**Well, it turns I may have been unnecessarily pessimistic because a very similar concept is apparently being perfected as we speak, and the company making the devices claims to have gone one better and added solar panels to the mix too.**

**So, is it really feasible to create power from solar, wind and wave, all from the same offshore floating platform?**

**Hello, and welcome to Just Have a Think**

**It’s sort of the Holy Grail of renewable energy isn’t really – a floating platform that can make use of all the sources of energy that nature can throw at it. I’m quite sure plenty of people have had the same conceptual idea, but at least up until now, no-one has worked out all the logistics and got a working example up to a point where it can be rolled out commercially.**

**Well, that’s roughly where a German outfit called Sinnpower has got to with their design, which they call the Offshore Hybrid Platform, or OHP, which for those of us of a certain age must definitely not be confused with the other OHP we might remember from yesteryear, which is an overhead projector. They definitely wouldn’t work so well offshore!**

**Anyway, this fresh-faced group of engineers and entrepreneurs, headed up by the systems inventor, Dr Philipp Sinn no doubt have no memory of such antiquated technology because they apparently have an average age of just twenty eight.**

**So, how does it work then?**

**Well, the basic idea here is to instal bespoke platforms for individual commercial customers using a completely modular set of components that can be assembled in pretty much any configuration the client requires, depending on their application.**

**That modularity also allows SinnPower to customise the platform layout according to the particular climate conditions of a given location, so in regions where there’s a lot of sun but not so much wave or wind, the platforms can be configured to be mostly PV modules, and in areas with a lot of wind and wave but not so much sunshine, the installation can be designed to run mostly on wind turbines and wave power.**

**The construction might look very basic and simple, but it’s actually the result of five years of intensive development and testing to achieve the optimal combination of strength, durability, modularity and very importantly, logistical practicality.**

**The whole system starts with these air-filled buoyant pipes made from marine grade aluminium that are fully sealed with welded caps, and which float horizontally on the water to support the platform. Each pipe can be either six or twelve metres long, weighing up to three hundred and seventy kilograms.**

**Now that’s obviously not something you could just pick up and walk around with, but they are very easily manipulated with forklifts and small lifting equipment and transportable on the back of a truck.**

**Onto that subframe are mounted six-metre-high vertical supports. Again made from marine grade aluminium, with stainless steel connectors to produce what SinnPower call a ‘super- stiff’ structure able to withstand the buffeting of the ocean and avoid corrosion from the salt water.**

**Next come the floats, which have to be very tough of course, because these things will be the first element of the structure that gets hit by incoming waves, so they needed to be sufficiently robust to stand the test of time. Sinn Power’s patented design is a polyethylene structure, constructed in segments like a cake with a central metal connection hub. Once all the wedges are connected the final float has a diameter of three point two metres and a lifting capacity of six tonnes.**

**So, four floats fixed together with the structural pipes and uprights gives you the smallest basic unit module. Then it’s just a matter of duplicating the modules to whatever size is required**

**But the floats don’t just provide buoyancy for the platform, they can also be connected to lifting rods connected to the main structure. That allows the floats to move up and down with the swell of the water. The lifting rods are then connected to a computer controlled, electronic bi-directional power generator rated at five kilowatts. All of that assembly can be added at any stage, even after the entire platform has been installed – so if a customer finds they need more power they can simply add more floats and powertrains to the framework.**

**The second generation-component of the modular system is wind power. At any junction where wave power is not being deployed, a twelve-metre tall mast made of the same maritime aluminium can be attached at the top of the frame to support a storm proof, continuous duty wind turbine supplied by a Munich based partner company called Luvside. The turbines are designed to utilise exactly the same electronic power generators as the wave system, so the simplicity of the modular design is maintained.**

**And of course, last but not least, the result of the full construction is a large flat platform surface area onto which solar panels can be assembled on top of lightweight 12-metre long maritime aluminium support struts, each capable of supporting 1 metric tonne per metre length. The struts can be installed at different levels to provide an angle for the panels if necessary. Each set of struts can support a panel configuration of up to seventy-two cells with a peak generation capacity of thirty kilowatts.**

**It’s important not to confuse this rigid offshore floating platform with the flexible floating solar panels you may have seen on inland lakes. Instead of rolling with the gentle undulations of an inland body of water, this system is designed to withstand the buffeting from offshore waves. According to SinnPower who say they’ve conducted extensive testing in real world situations, the height of the platform keeps the solar panels sufficiently out of the way of large breaking waves to dramatically cut down on salt spray which could otherwise hamper the performance of the PV system.**

**The same cross member struts can also support solid floors with a load bearing rating of 1 tonne per square metre. That means the platform can easily be configured to allow for other infrastructure, creating what the company describes as an ‘industrial island’. What the platforms get used for is really only limited by the imagination of the end-user, but Sinn Power envisage all sorts of applications. Food processing could be an option for example, maybe in combination with aquaculture and fish processing, with a platform docking point to take produce to shore.**

**Or the systems could simply provide vital power in remote parts of the world, like small island developing states, most of which currently rely on very expensive and very dirty diesel. A large configuration of platforms could act not only as a power source but also a logistics hub for a group of islands where goods could be consolidated before being distributed out.**

**And the platforms would be extremely well suited to locations adjacent to the mega cities on coastlines all over the world. Space in those locations is at a massive premium for obvious reasons, so moving just offshore could be a very cost-effective way of locating a power source, perhaps for something like a data centre providing computing and internet for the city, or even, at some point in the future, for running electrolysers to produce green hydrogen either for heating or for aviation fuel to supply a local airport.**

**But the core vision for Sinn Power, and the reason why the German Federal Government have provided financial support for the project, is to utilise the platforms as a supplement to existing large offshore wind farms that are now quite commonplace in Northern Europe and becoming more popular around the world. These are typically massive installations at quite a distance from the coastline with massive cables to bring the power back to land. In the winter, when it’s usually very windy, these facilities produce very large amounts of power, but in the Summer when the wind is generally far less strong, the wind farms are far less useful. So, these OHP platforms are planned to be configured with wind and solar power and integrated into the wind farms to provide a more continuous power supply and to optimise all the logistics of installing and maintaining these massive installations. The platform modules can be combined together up to capacity of ten megawatts and the folks at Sinn Power have calculated that the power output of a typical large offshore wind farm could be increased by almost a factor of ten, cutting the cost of power production by a third.**

**The whole rig is anchored down using yet another modular system of multiple chains and concrete weights. That not only results in anchoring at multiple points, but it also provides a bit of built in security so that if one chain is breached for some reason then you still have multiple anchor points intact.**

**All the components are designed to fit inside a forty-foot shipping container so they can easily be transported by road and sea to their final location.**

**Extensive testing has been taking place in Heraklion in Greece and Sinn Power are already actively marketing their system to project developers worldwide.**

**So, there we have it folks, if it works the way that Sinn Power claims it does, which of course remains to be seen over a real world operational lifetime, then we might just have another example of the sort of lateral thinking that would make my childhood hero Edward de Bono very proud!**

**I’m sure you’ll have your own views on whether this kind of installation could really be viable, so if you do, or if you work in the industry and you can share your experience and knowledge, then why not jump down to the comments sections below and leave your thoughts there.**

**That’s it for this week though.**

**As always, a huge thank you to the channels amazing Patreon supporters who help keep these videos completely independent and ad-free. And I must just give a quick shout out to the folks who’ve joined since last time with pledges of ten dollars or more a month.**

**They are**

**Gregory Gooch**

**Stephen Morris**

**Greg Kochanski**

**Richard McDonald Woods**

**Mait Sarv**

**Steve Henrichs**

**Thomas Tarpey**

**Mark Barbera**

**Stuart Mackintosh**

**And**

**David Lonergan**

**You can join them over at the channel’s Patreon page where you can share ideas and information with like-minded folks and watch exclusive monthly news updates from me plus influence the direction of the channel by taking part in monthly content polls. And you can find that page at**

[**patreon.com/justhaveathink**](http://www.patreon.com/justhaveathink)

**and of course, the most influential way you can show support for the channel on YouTube is if you can hit that subscribe button. You can do that completely for free of course and it really does help to get the channel noticed by the dreaded YouTube algorithm so that we can get information to a wider audience around the world. It’s just a simple click of a mouse, which you can do down there, or by clicking that icon there.**

**As always, thanks very much for watching, have a great week, and remember to Just Have a Think.
See you next week**