
Coastal wind development is complicated

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While I agree there's lots of potential with coastal wind development, the situation is complicated.

This potential could bring many local economic benefits. However, it's unclear whether offshore wind farms would pay property tax, which is the largest single operating expense of a wind farm and the biggest boon to rural counties.

Most counties hosting wind projects have discovered they're a big tax base increase without a corresponding increase in demand for public services, along with the money spent locally during construction and by the local operator, plus the new quality maintenance jobs.

And the more supporting infrastructure that's needed, the more jobs and potential tax base.

But this has its downsides, because every project lives and dies in a highly competitive wholesale market.

There're many challenges between now and having an offshore project operating. The technology clearly is feasible and already in use elsewhere. But a 10-megawatt (MW) demo project (one to four turbines) would be difficult to get done, because it lacks economies of scale and there's no entity willing to pay above-market rates for the energy produced by a small project - not to mention nascent infrastructure to support an offshore operation.

It's unclear what a demo project would demonstrate, since these projects are commercial elsewhere. Perhaps its main functions would be to motivate infrastructure development and test public opinion?

Five years is ambitious to get an onshore project from start into commercial operation, so the first offshore project in the area is very likely to take longer than that.

Despite many efforts since the 1980s from Cape Blanco to the north end of Oregon's coast, only one coastal wind project has been built: the 25-turbine 1.25MW project at Whiskey Run decades ago.

In the '80s, over \$1M was spent by several Oregon utilities, the BPA and mainly by a developer to study a wind project on Cape Blanco.

Wind Energy Specialties proposed a project west of Langlois in the '80s, but there were issues of a high water table and immature technology, so costs were too high.

The City of Bandon once conducted a community study of wind power. More recently, another developer tried to start a project on a Coast Range ridge line east of the highway near Nehalem.

The main impediment has always been scenic concerns: nobody wanted to see turbines from the coast highway, no matter how progressive the community.

Other objections have focused on migratory birds using the coastal bench northward of Port Orford, which are protected by the Migratory Bird Treaty Act, and other sensitive coastal species like the one that stopped a project on Radar Ridge just north of Astoria.

Short of transmission and market issues, these alone have been sufficient to stop projects. These issues could also affect offshore wind, unless they're tens of miles offshore (which doesn't cure transmission problems and raises costs).

The NREL report shows the best near-shore winds along the far southern Oregon coast are from Cape Blanco southward. Many wind studies have been done in the Oregon coastal zone over the decades. Cape Blanco lighthouse had a measurement site and it showed stellar winds.

Resource adequacy has never been an issue, as long as the site is well exposed (which also puts it in obvious sight). Wind turbines are much larger now than when all of the prior coastal zone projects were attempted.

A number of studies and the wind data show the desirability of getting wind energy from different areas into the grid. At this point, the next MW of wind would be more valuable to the electric network from the coast than more in the lower Columbia. This is because each area has different 24x7 and seasonal production patterns.

The system works the most efficiently when these patterns are complimentary instead of additive - a combination would save ratepayers more money, reduce more pollution from conventional sources and be easier to manage.

Such studies have largely been forgotten by the private sector in favor of where and what is the next, easiest and least expensive project opportunity.

While everyone wants to market into California, these are difficult to reach from the Northwest. A long undersea loop line to tie in various projects was tried a few years ago by Google off New England. Such cables are very costly, so would require a huge project to economically justify.

And if there's more than one project on it, the line needs to be AC.

Selling into California also raises the issue of to whom? PG&E normally would be a good target, but in bankruptcy they're not a creditworthy buyer. SMUD doesn't have sufficient appetite. And cumulative transport costs to move production to a buyer across lines of multiple ownerships are prohibitive.

BPA and the small consumer-owned utilities are not viable markets. PacifiCorp is along the southern Oregon coast, but their southwestern Oregon/northern California load area already has more new renewable power generators queued up to connect than they have load there for.

So, the obvious Oregon market for a large project would be PGE.

Any wind production sale to a utility would occur via a competitive (delivered) wholesale price auction.

However, all Oregon offshore and coastal wind development is constrained by inadequate transmission back to big loads at Willamette Valley cities or to northern California. Once the initial small amount of available transmission capacity is used, developers will have to finance long and very costly transmission system upgrades - which is a project killer.

The current FERC-compliant (FERC regulates wholesale markets and electricity transmission) process at all Northwest utilities and BPA has the project paying upfront for all system upgrading, and that's partially recouped over the operating life of the project.

This financing is a huge operating capital commitment that instead could be used to develop more projects, and developers' cost of capital is higher than the BPA's or a utility's. Also, the timing of such financing commitments is awkward in the schedule of development - there needs to be a better way.

Such upgrades would be mitigated if there were new, large electric loads in the nearby coastal zone, but such loads are very unlikely. The consumer-owned utilities along the coast have small loads, low load growth and low retail electric rates ... so they're very reachable, but unlikely customers.

There has long been a queue of entities lined up to absorb any new Northwest transmission capacity to California, so a new project would have to go to the end of the line. And those Northwest upgrades would need to be matched in scale and timing in California, which has a different grid operator, from the border to the buyers.

The prospects of this are more than a decade away.

Production from coastal wind would need to be integrated into a system designed just to serve coastal loads from far away. So, when coastal production exceeds local loads, the power flow would reverse. This could occur on a diurnal or seasonal basis.

It doesn't help that the BPA lines feeding the coast are radial circuits, which are prone to instability compared to looped high-capacity grid that would best suit a raft of coastal wind projects.

At least there are 115kV lines along the coast and a 230kV circuit south of Coos Bay, which would be the targets of any coastal project.

So what to do? Clearly there's institutional & regulatory problems to be worked out, starting at FERC.

One idea is handling new renewable energy as a public good. And formal regulatory recognition the current transmission upgrading process which has each new project financing very costly transmission upgrades really benefits everyone.

A solution is needed for the chicken 'n egg problem of infrastructure and wind project development - each requires the other.

Contracted transmission capacity is underutilized but there's no marketplace for those owners to sell their unused contract capacity - an inefficiency which should be corrected.

Also, there's no mechanism for a wholesale middleman to aggregate a many smaller customers into one buy big enough to support an economical large project.

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