3 Questions: Stephen Connors on offshore wind farms

April 30 2010, by David L. Chandler

(PhysOrg.com) -- Stephen Connors is director of the Analysis Group for Regional Energy Alternatives (AGREA) at the MIT Energy Initiative. He is a graduate of what is now the Wind Energy Center at UMass-Amherst and an inaugural board member of the U.S. Offshore Wind Collaborative.

MIT News asked him about the impact of the U.S. Department of the Interior's announcement on April 28 that it will allow a 130-turbine project called Cape Wind, to be built in Nantucket Sound. The project would be the nation?s first offshore wind farm.

Q. How important do you think this decision is in terms of opening the

door to a broader development of offshore wind resources in the U.S.?

A. Being the first, the Cape Wind project in Nantucket Sound has been instrumental for getting an offshore wind industry rolling in the United States. When first proposed in 2001, it was not clear whose job it was at both the state and federal levels to grant the permits, let alone how. This was especially true for the environmental impact assessment, since there was no real baseline of ocean environmental criteria or magnitude of acceptable impacts on lobsters, clams, fish, birds and whales. It was several years into the permitting before the federal government passed a law selecting the Department of Interior's Minerals Management Service (MMS) as the coordinating federal authority for granting the final permit, although the Army Corps of Engineers, EPA and the Coast Guard all played important evaluation and approval roles.

Early in Cape Wind's permitting process there were several proposed offshore projects, such as off Long Island. These were all mothballed or never got started as the Cape Wind experience dragged out. However, once Cape Wind had the majority of its Massachusetts permits, and the federal review process with MMS was moving forward, other serious projects and state initiatives from South Carolina to Maine and the Great Lakes have been appearing.

While is has been a bumpy ride for Cape Wind, they appear to have steered their way through the now-charted regulatory waters, and others are following in their wake. This has been helped by the continued development of European offshore wind, especially in the areas of wind turbine technology and construction techniques.

Q. Given the many years of ups and downs this project has been through, is this decision really the final word, or are there any remaining possible pitfalls?

A. It appears to be. The Department of the Interior-MMS permit was Cape Wind's last remaining permit. However, that doesn't mean the ruling cannot be challenged. But Cape Wind has withstood numerous challenges already, so there is some confidence that most challengers' arguments have been heard. In anticipation of the project's approval, several groups announced their intention to challenge MMS's ruling, including the Aquinnah Wampanoag Tribe of Martha's Vineyard and the Alliance to Protect Nantucket Sound. Secretary of the Interior Ken Salazar's decision to approve the project puts to the side the recommendation of the Advisory Council on Historic Preservation that the project's impact on "historic properties" was too great. So that is a likely source for the next round of challenges, even though Salazar's permit requires Cape Wind to perform an archeological survey of the wind farm's seabed location and several other requirements.

Q. How significant is the offshore wind potential in this country, and are there any remaining potential roadblocks or challenges to developing that potential?

A. The U.S. Department of Energy's 2008 "20 Percent Wind Energy by 2030" report estimated that there is 54 gigawatts of offshore wind potential, roughly 4 percent of the nation's projected electricity demand if fully developed. Many states including Massachusetts, New Jersey and Delaware have been developing marine utilization plans, including zoning for offshore wind. These take into account fishing, shipping and visual impacts, so some "pre-siting" has been occurring. The cost and performance of offshore wind turbines is still an unknown.

Most commercial experience in offshore wind has been "wet-foot" wind, namely larger, “marine-ized” versions of land-based wind turbines mounted directly to the ocean floor in relatively shallow waters. This is fine for Europe's North Sea where shallow waters reach far out into the ocean. Along the Northeast Coast of the U.S., many of the shallow

waters remain close to shore, inviting local opposition. One alternative is the floating wind turbine, or what MIT Professor Paul Sclavounos calls the "invisible wind turbine." Using design tools developed for offshore oil rigs, Sclavounos has been designing floating structures for wind turbines that can be towed out and hooked up. Several European companies have just begun scale demonstrations of floating wind turbines. With ocean depth and sea floor geology less of an issue, it is hoped that floating offshore wind technologies will allow us to tap a larger portion of the ocean wind resource. This is especially important for the U.S. Northeast Corridor. With both high population densities and more forested and/or protected mountains than farmland, the opportunity for large, land-based wind installations is small. If the New England and Mid-Atlantic coasts are going to have lots of wind-generated electricity, it will need to be offshore.

Provided by Massachusetts Institute of Technology