

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

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The Answer is Blowing in the Wind



A wind turbine off the east coast of the UK, which now is the leader in offshore wind with 41% of Europe's capacity.

Sooner or later, the entire planet will realize that our dependence on fossil fuels will end and that we will ultimately have to rely on renewable forms of energy. Once government leaders understand that the Earth isn't making any more coal, oil or natural gas, and that continuing to burn them is creating a number of impacts that are increasingly being felt across the entire world, we will have crossed an important threshold.

While we have grown accustomed to looking at the large populations of China and India, which combined have about 37% of the world's people, as major challenges for dealing with global climate change, the tide is turning quickly and the U.S. is now the one often seen as lagging behind and dragging our feet.

China and India have discovered that through major investments in wind and solar power that they and other nations in Europe have driven down the cost of these renewable technologies such that, in many areas, they can generate power at lower costs than fossil fuels like coal. Change is happening much quicker than many believed possible or expected. This is good news.

While China is still the Earth's single largest emitter of carbon dioxide, generating about 28% of this greenhouse gas (the USA is No. 2, producing 16% of the total, while India and Russia are tied for 3rd with 5% each), for the past three years China has reduced their coal usage and recently terminated plans to build over 100 new coal-fired power plants. India also believes that they may not have to build any more new coal-fired plants. These are huge steps forward for all of us living on the planet.

Certainly the dreadful air pollution that mantles huge cities like Beijing and New Delhi, and that has had a significant effect on the public health of their citizens, is also a strong incentive for both China and India to develop clean energy.

Additionally, continuing investments and efforts at improving technologies and in manufacturing of both solar and wind power systems is also providing a boost to their economies.

These are very significant changes that will provide positive incentives to all of the signers of the Paris accord and show that both China and India are well on their way to meeting their emission reduction goals.

The USA energy industry is also beginning to discover that investment in wind energy makes economic sense. Two years ago, General Electric acquired a very large French energy company, Alstom, for \$10.6 billion, the largest purchase in the company's history. The agreement included acquisition of Alstom's manufacturing operation for offshore wind turbines, including the factory that built the five large turbines making up the USA's first offshore wind farm, Block Island off Rhode Island.

Last year, GE took another major step forward and spent \$1.65 billion to acquire Danish-based LM Wind, the world's largest turbine blade manufacturer. LM Wind announced last month that they are now constructing a new wind blade manufacturing facility in France that will have the capacity to build the world's longest turbine blades, nearly 300 feet long. The factory will also provide at least 550 direct and 2,000 indirect jobs as France continues to expand its offshore wind capabilities.

Deepwater Wind now has a green light to begin an offshore 15-turbine project off Montauk, Long Island, where they could eventually construct up to 200 turbines. Statoil, an international energy company based in Norway, recently spent \$42.5 million to obtain an offshore lease for an area of seafloor off Long Island's Jones Beach.

Maryland is also in the approval stage for offshore wind farms. Massachusetts has mandated 1,600 MW of offshore wind power as part of its 2027 wind portfolio. And New York's Governor is pushing for 2,400 MW of offshore wind by 2030. While to date there are still only five wind turbines in US waters, the renewable energy future is looking brighter as investments are increasing.