Renewable Maryland

PROECT OVERVIEW: PHASE 1

WHY MARYLAND?

Maryland is a state that is actively working to develop and support the renewable energy industry. A number of existing policies, programs, and regulations are in place that support renewable energy development.[1] A large number of organizations and individuals are working to implement them and to create an even more supportive structure. Renewable Maryland is a two-tiered project with a goal of developing and implementing policies that are necessary to establish a fully renewable (CO_2 emissions-free) efficient energy sector in Maryland by 2050.

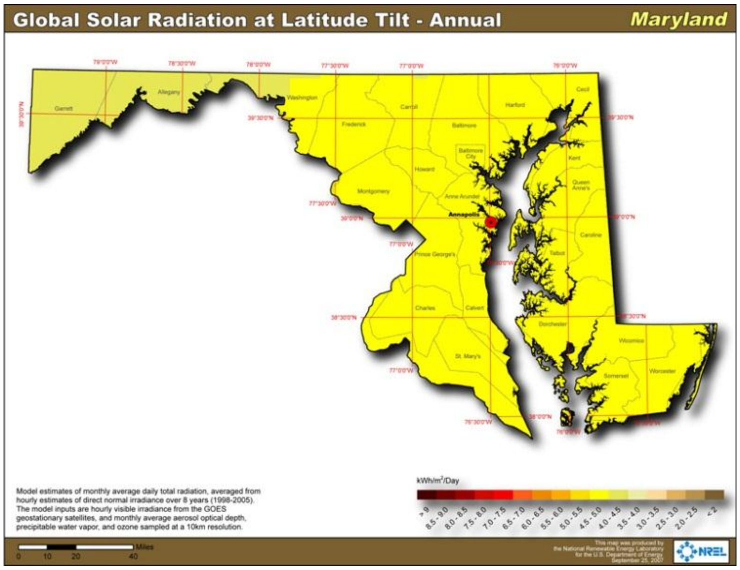

Figure 1: Maryland Solar Radiation Estimates (2007)

There is already a good policy foundation with the Empower Maryland Efficiency Act (15% reduction in per capita energy consumption by 2015, based on 2007 use), appliance and equipment energy efficiency standards and building energy codes, net metering for on-site renewable energy generation, and a Renewable Portfolio Standard of 20% by 2022, with a 2% carve-out for solar by 2020.[2]

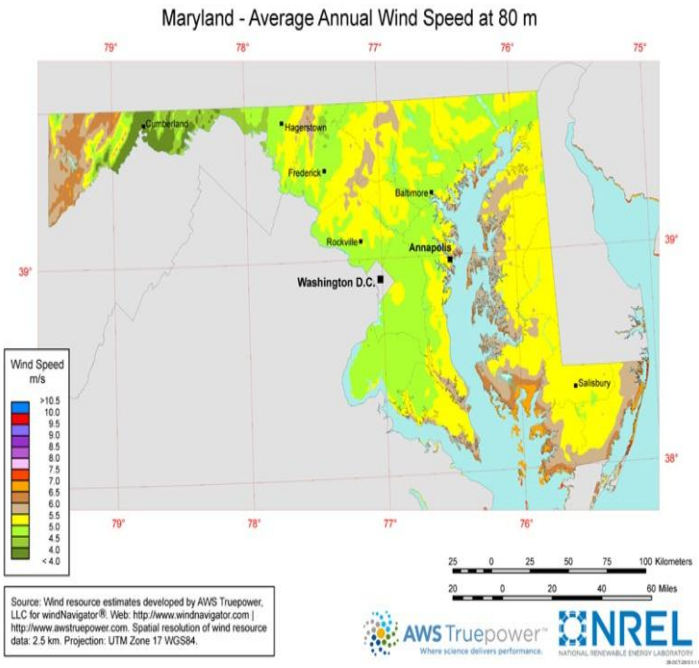

Figure 2: Maryland Average Annual Wind Speed at 80 meters (2010)

Solar and wind energy are plentifully available. Maryland currently has an installed solar PV capacity of just 71 MW.[3] The projected installed capacity in 2022 is 1,094MW. Maryland's solar energy resource quality averages 5.3kWh/day/m2 (Figure 1): 25 to 30% better than Germany, the world leader in solar PV. Solar PV can play a much bigger role than currently envisioned, given rapidly falling prices.

Maryland currently has 120 MW of installed wind capacity. The untapped on-shore wind resource is modest: 1,483 MW; most of the wind energy potential lies in offshore – more than 53,780MW.[4] This is about 3 times Maryland's 2010 electricity use. Among the main issues will be to optimize solar and wind combinations with other sources, to figure out the role of combined heat and power, storage, and demand dispatch and to marry it all to an energy system that is increasingly efficient.

ABOUT THE PROJECT

In 2007, IEER published Carbon-Free and Nuclear-Free, which demonstrated that a fully renewable energy sector in the United States by 2050 was technically and economically feasible. We followed this up by electric-sector studies, focused on reliability. Our Utah and Minnesota studies showed that the same reliability level as at present can be maintained with a fully renewable electricity sector. With efficiency investments, the costs of energy services would be comparable to today (as a fraction of gross state product), despite higher costs of wind and solar PV per kWh, when storage is included. But important gaps remain in these studies that prevent the demonstration of feasibility into the reality of policies and implementation. We aim, working in partners ship with the Town Creek Foundation and environmental NGOs, to fill those gaps in our Renewable Maryland Project.

RENEWABLE MINNESOTA, PUBLISHED MARCH 2012 CAN BE FOUND ONLINE AT: HTTP://IEER.ORG/RESOURCE/REPORTS/RENEWABLE-MINNESOTA-TECHNICAL/

EUTAH: A RENEWABLE ENERGY ROADMAP, PUBLISHED DECEMBER 2010 CAN BE FOUND ONLINE AT: HTTP://IEER.ORG/RESOURCE/REPORTS/EUTAH-RENEWABLE-ENERGY-ROADMAP/

- **We aim, with your participation from the start and throughout the project, to ensure that the long-term vision of an emissions-free energy sector is connected coherently and usefully to short-term and medium term advocacy of the entire community.** Perhaps the most important gap in our Minnesota and Utah work is that those projects addressed only questions related to the technical feasibility and cost of a fully renewable electricity system – out to the year 2050. The connections to existing short- and medium-term policies and to similar long-term goals of environmental groups were missing. We also hope that those goals can be adjusted as needed to create a smoother and more coherent path to an emissions-free energy sector as technology evolves and relative costs change.

- The second gap in our recent electricity-centered report was technical. We did not **explicitly factor in distributed technologies** such as combined heat and power, demand dispatch, and local storage. Nor did we explicitly factor in the use of natural gas in buildings and the synergisms in the economics of efficiency that come from considering natural gas and electricity together. So our modeling was limited in its ability to connect conceptual work to practical advocacy.

- The third gap was **specific milestones**. Given present price and technology projections, what are reasonable goals for efficiency, solar PV, etc. that will connect to an emissions-free system 30 or 40 years from now. Is there a process by which the milestones can be updated with changing circumstances – such as the worsening prognosis for climate disruption, for instance.

- Finally, we **aim to address the entire energy sector in Maryland, not just electricity** as we did in our Minnesota and Utah studies. This will allow us to integrate diverse aspects of the problem such as eliminating petroleum from the transportation sector and natural gas from the residential and industrial sectors, while also addressing transition questions and synergisms between say, electric vehicles and smart microgrids.

We have no agenda for advocacy other than an emissions-free energy sector as soon as economically and technically reasonable – 2050 is one reasonable date, but it can probably be pushed up by ten or fifteen years. This is something that can and should be jointly explored.

We envision a project structure that will enable (i) production of resources geared to advocacy, (ii) participation in Maryland advocacy, and (iii) continual feedback from the environmental community and state and local entities. Part of that structure will be an advisory board comprised of members in the environmental and energy industries, non-governmental organizations, and members of Maryland governmental agencies. The advisory board members will be responsible for ensuring that the project remains relevant to the Maryland community and will have the ability to help shape and define a living roadmap that will have its vision constantly fixed on an emissions-free energy sector. IEER will remain responsible for the technical integrity of the project and will develop policies and work on advocacy in collaboration with the Maryland environmental community.

We have set up a password protected webpage on the IEER website where a list of project partners will be made available, as will the materials and resources for the stakeholder meetings and any documents that result from those meetings. Please feel free to contact project coordinator Christina Mills (see box) if you have any questions about the meetings, the project, or anything related to this effort. Or you can reach me, Arjun Makhijani, directly at 301-270-5500 or arjun@ieer.org. If you email me, please copy Christina (christina@ieer.org). I'd be happy to meet any of you individually here in Maryland and to work with you in Annapolis.

FOR FURTHER INFORMATION CONTACT:
CHRISTINA MILLS
RENEWABLE MARYLAND PROJECT COORDINATOR
CHRISTINA@IEER.ORG
612-722-9700

Notes:
[1] See http://energy.maryland.gov for information on the current status of Maryland's clean energy policies and goals.
[2] See http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MD05R&re=1&ee=1.
[3] http://energy.maryland.gov/solar.html
[4] On-shore wind estimates are at a hub height of 80 meters, and off-shore wind estimates are at a hub height of 90 meters. http://www.awea.org/learnabout/publications/factsheets/upload/3Q-12-Maryland.pdf

Sources for Figures:
Figure 1: Maryland Solar Radiation Estimates (2007) at http://apps1.eere.energy.gov/states/images/maps/map_large_pv_MD.jpg (produced by National Renewable Energy Laboratory)
Figure 2: Maryland Average Annual Wind Speed at 80 meters (2010) at http://apps1.eere.energy.gov/states/images/maps/map_large_wind_MD.jpg (produced by AWS Truepower and National Renewable Energy Laboratory).