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The Portland Climate Action Team: Community Solar

By Allen Armstrong

The Portland Climate Action Team came together in February. We selected Community Solar Farms as our project after a brief brainstorming process mitigate climate change. We considered projects such as promoting bicycle and transit use, but selected solar power because it directly reduces fossil fuel use, is highly visible and would be possible for us to affect.

We quickly narrowed our focus to promotion of Community Solar Farms. Many of us had been looking for a way to obtain our electricity from solar, and not had a way to install it on our house or apartment. In my case, we had installed the few panels permitted by our Historic Districts Commission, but wanted to get the rest of our usage met by solar. At the time, Maine had one CSF, in South Paris, so we knew what one looked like.

Organizing more of them seemed a task we were able to take on. When one of our members, Roseanne Graef, had suitable land that she was willing to lease, we had a tangible project to promote. Roseanne engaged ReVision Energy, the solar installer which had organized the South Paris farm, to organize it. Our role as the CAT then became that of recruiting investors. We held a meeting in July that introduced 23 prospects to the benefits of investing in CSFs. 7 of those indicated strong interest.

Because Maine law limits the number of CSF participants to 9, only a few could be accommodated by the Wayne project, as it came to be known. We started looking for other possible locations, and thought of Portland's closed Ocean Avenue landfill. The site may be as large as 44 acres, and is unsuited for other use, except, perhaps for the dog park that is adjacent to it. In vetting the site, we found that the nearest suitable 3 phase, low voltage electrical service was a quarter mile away, and would require an investment on the order of \$100,000 to connect. Clearly, a small CSF could not afford that much infrastructure cost.

This might be a good time to share some of the details we've learned about CSFs. They have some administrative costs that residential rooftop solar installations don't. These include rent payments, legal costs for organizing the mutual benefit nonprofit corporation, insurance and maintenance.

These extra costs can be largely compensated by economies of scale, ground mounting, optimal orientation and absence of shading. Scale economies can be achieved starting at about 60 kW, or 240 panels. Since Maine regulations permit only 9 meters, the average participant must sign up for 7 kW, or about 8400 kWh per year. Many households use that much electricity in a year, but most do not. Under Maine's net metering regulation, energy produced in excess of one's usage is forfeited after a year. These two legal provisions combine to create a problem for CSF organizers. In the case of the Wayne farm and another farm now under construction, organized by the Freeport Climate Action Team, the capacity minimum was met by including a couple of 20 kW investors. My wife and I were able to join the Freeport farm for just 3 kW, because of them.

At about \$4200 per kW, the total investment in a typical CSF might be \$250,000. Clearly, such a project could not afford a \$100,000 connection charge. For the Portland landfill, we needed to be able to share the connection among multiple farms, or find a way to build a much larger project. We arranged a meeting with Portland's City Manager. We found Jon Jennings to be enthusiastic about building more solar power in Portland, but wary of locating more than one project on the landfill. We found this reluctance to be shared by other solar actors, who thought this sharing would invite a battle with the utility.

As we were looking for a way forward, the city received a proposal in response to its request to buy power from a company which would install panels on the roofs of 4 municipal buildings. The proposal from ReVision Energy recommended instead that the City install the maximum allowed under net metering, 660 kW, on the landfill. This would provide 6% of the city's usage. This proposal has now cleared the Transportation, Energy and Sustainability subcommittee, and will go to the Land Bank Commission next week. At this point it looks probable that the city of Portland will go forward with a much larger solar installation than we could ever have organized. This will have been a joint effort by a number of folks, but we feel we might have been the spark that got it going.

In recognition of that role, the city's environmental manager gave us a shout out in his presentation to the TES subcommittee. Also, the city has offered us the use of another landfill, on Peaks Island, for a community solar farm. We're now asking installers to check out the site, which, fortunately has a proximate electrical connection point.

In the course of these activities, we've learned something about the way that Maine's laws limit our solar acquisition rate. We do have net metering, thank goodness, as do most states. Net metering means that customers are paid retail price for the power they generate up to the amount they consume, and can carry excess forward up to a year before it is lost. It might seem like a subsidy, to pay retail for power the utility can buy for about half that, but according to an extensive study by the Public Utility Commission, solar power is actually worth far more than that to all ratepayers--as much as 34 cents per kWh, depending on how much social benefit you include. Other New England states pay more of that benefit to solar investors. And in return, see a lot more solar investment. Maine presently has about 13 MW of installed solar in contrast to for example, Massachusetts, which has 876 MW of solar. Financial incentives need improvement. There are other obstacles to proliferation of solar in Maine. I've mentioned the obstacles to the organization of CSFs: the limitation on number of participants, and number of farms at one location. These apparently found their way into legislation because a utility was doing the bookkeeping by hand!

A bill to rectify these and other obstacles to solar was introduced in the last legislative session, but withdrawn, replaced by an instruction to the PUC to convene stakeholders and recommend to the legislature an alternative policy to net metering, that will get Maine up to 255 megawatts of solar by 2020. The Sierra Club has a seat as stakeholder in these proceedings. We have submitted comments that reflect our experience in organizing community solar farms.

The players in this forum are the Office of the Public Advocate, who represents the interests of all ratepayers, the utilities, CMP and Emera (aka Bangor Hydro), solar advocates such as NRCM, Efficiency Maine, Union of Concerned Scientists, Conservation Law Foundation and ourselves, municipalities and the PUC staff. The OPA proposes, the rest of us comment, and the proposal gets changed. It's an open and inspiring process. Most of us agree that the OPA, Tim Schneider is an intelligent and fair-minded guy, even if he was appointed by our governor. In representing all ratepayers, and working toward a solar incentive structure that will achieve a goal without overpaying for it, he can seem at times to resist the incentives that we advocates would favor. But the end result will

have to pass both houses of the legislature with enough margin to overcome the expected veto.

An example of the type of issue we're grappling with now is Renewable Energy Credits, called RECs. When a solar panel produces electricity it produces two sorts of value: The electrical energy itself, and what we can call an amount of "greenness", or the fact of the power's having been produced without emitting carbon dioxide. Greenness has monetary value because some jurisdictions have Renewable Portfolio Standards (RPS). These require that utilities purchase some fraction of their total output from sources that don't generate NET CO2 emissions. Maine has such a standard, but it includes biomass and hydro. Maine has so much of these, that it has no trouble meeting its RPS without buying RECs created by solar, so for practical purposes, there is no REC market in Maine. Massachusetts' RPS is more demanding, in relation to available resources, so power companies have to buy some of their "greenness" from solar generators, in the form of Renewable Energy Credits. Presently, a REC is worth 4 to 5 cents per kWh, compared to the retail price of 14 cents per kWh. So that part of the value stream generated by a solar panel is significant. If sold with the electricity, it can make solar economics look a lot more attractive. And the OPA proposes to sell the RECs with the power to a Standard Solar Buyer, for a price that, at least for now, can appear attractive compared to retail price. The problem, though, is that people who want to install solar generally want to feel that they using carbon dioxide-free power. If they sell their RECs, they are not doing that. It's not easy to understand why not. The best explanation I can offer is this: When the REC is sold, the buyer gains permission to produce that much power from an emitting source rather than from a non-emitting source, as would otherwise be required by the applicable RPS. So that solar installation produces NO NET increase in emission-free energy. I would expect that most solar customers would not be happy with that, if they understood it. But it's hard to understand. I was unable to explain it to the other eight members of the CSF that I joined.

This issue is one of the remaining ones to be resolved in the PUC process: Must the RECs be sold together with the power to the Standard Solar Buyer, or is there some administratively practical way to allow solar investors to keep their RECs, and presumably "retire" them. To his credit, the OPA has recognized the issue, and tried to find a way to address

it. Those of us who want to see net CO2 reductions would like the default to be that investors own their RECs (and need to act affirmatively to sell them). The numbers are more challenging when the RECs aren't sold, so that goal may not be achievable.

Community Solar Farms will likely be affected by new legislation. The OPAs original proposal would have treated them much like grid-scale projects. The permitting process would involve an auction in which a proposed project would compete with others on the basis of how small a price they would demand for their power, delivered to a Standard Solar Buyer. Really large projects would crowd out smaller ones. This would lead to the lowest cost for the generated power, but something would be lost: The ability of nonprofits and small groups to organize CSFs. While these farms may not be the most efficient generators, they allow their members to have an active part in the universal project to wean ourselves from fossil fuels.

This process will come to an end in January. The PUC will write a report that tries to capture a consensus view of how Maine should structure its solar incentives to catch up to our New England neighbors. We're not there yet. But we in the Portland Climate Action team feel grateful to have had the opportunity to push solar power forward in a couple of different ways, and with that to have had a small part in mitigating climate disruption.