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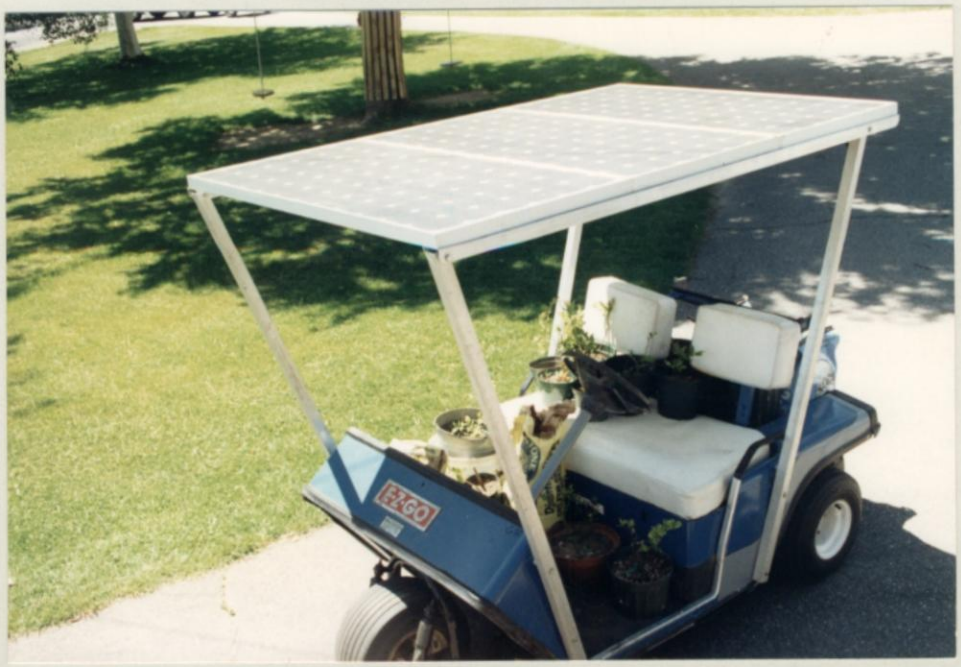
BERRY HILL FARM
STRATHAM, NH

FINAL REPORT
SOLAR VEHICLE FOR FARM USE

NOVEMBER 10, 1994



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On June 6th the PVEV (photovoltaic electric vehicle) became a reality. We have used it all summer and fall, with tremendous success. Here is how it was done: we bought a golf cart (a used EZ-GO, with 6 six-volt batteries); we bought 3 photovoltaic modules of 100 watts each; we mounted the modules on aluminum supports bolted to the sides of the cart; and then we connected them to a charge controller, to prevent overcharging, and to batteries located under the bench seat. The modules thus serve as the roof of the cart, collecting energy while they keep us in the shade. Finally, we added a hauling tray on the back to allow us to take full advantage of the 700 pound payload.

Our solar input averaged 7 amps per hour @ 36 volts, for about 5 hours per day (10am to 3pm), or 35 amp hours per day. The EZ-GO cart draws 50 amps @ 36 volts when it is running. Therefore, the cart can run on its own solar power for about 45 minutes per day. (Unlike an internal combustion engine, an electric motor does not use power when the vehicle is not moving, because there is no idling.) We do have an electric charger, but did not have to use it at all once the modules were installed.

We kept a record of the minutes we used the cart each day, and found that we averaged only about 15 minutes per day of actual driving time. This year, being our first year open, our season was short, only 2½ weeks in June. Since we were not open for pick-your-own customers in the raspberry or blueberry patches in July and August, the cart was not used for customer transport, as it will be in the years to come. We found that we will be able to use the cart ***three times as much*** once our plants mature and we can open to the public. Thus its importance to the farm is going to grow and grow.

Our total usage through October was 19¼ hours. Calculating the cart's rate at about 6 miles per hour, we used it to travel about 115½ miles. If we had used the pick-up to drive those same miles, it would have consumed 23.1 gallons of gas. We will continue to use the cart into December with weeding, mulching, pruning etc., so this is not yet a final figure for the year.

Saving time has turned out to be one of the greatest assets of the cart. For many of the minutes the cart was in use, it was carrying us to and from the fields for quick errands. Without the cart, we would have probably walked. To anyone, time saved is a significant plus.

Addressing the other issues that the cart represents for us, we are very pleased with its performance. We find it safe, pollution-free, free of running costs, and very accessible to people with disabilities. We can load it with a 40-gallon trash can full of water, or a tray full of berries, or tools for a full day's work in the fields. People even used it as a shady and comfortable place to rest during the picking hours of the June heat wave. We also find no noticeable soil compaction when we run it between the rows of raspberries for pruning or picking.

We made a big effort to satisfy the outreach aspect of the grant:

1. We gave a demonstration/free picking tour to 40 campers and counselors from Mill Pond Arts Camp (see photo on p. 2);
2. In conjunction with Nada Haddad of the UNH Cooperative Extension Service, we held a Farmers' Twilight Meeting on September 21. Announcements of the meeting were published via press releases throughout the state, as well as in the *Maine Organic Farmer and Gardener* newsletter. Nada also sent an invitation to all the farmers in Rockingham County who are on her mailing list. Approximately 60 people came to view the cart and learn about its construction. We gave each of them a narrative summary and a technical drawing of the completed cart (attached).

3. The attached articles about the cart have been published in *The Exeter Newsletter, the NOFA NH Newsletter, The Natural Farmer,* and *The Maine Organic Farmer and Garener.* Articles have been submitted to two nationwide publications, *Organic Gardening Magazine* and *Real Goods News.*
4. We may offer a workshop on the conversion next summer at the NOFA Conference in Amherst, MA; or the cart may simply be on display with handouts available to all interested.

We are extremely grateful to all of you who helped to make this possible for our farm. We will be happy to demonstrate the cart to any of you who would like to come see it.

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