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Economic Water & Electricity (EWE)

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Summary

Remote regions of Canada and the Developing world need a simple and economical means of providing water and electricity to rural residents. There are existing proven technologies that can be easily combined to achieve this objective. In the Developing World a household needs less than 200 watts of electricity to provide a few electric lights so that they can work, read or improve their education when the sun goes down – many developing countries are closer to the equator and thus have 12 hours of sunlight and 12 hours of darkness with only small variations year round. Electricity also allows economic radios and the regular recharging of electric devices such as cell phones and computers.

Solar panels and small wind-driven generators can produce electricity mainly during daylight hours but there is no economic way of storing electricity if available. However, when power generation is combined with water supply both of these objectives can be achieved. The solution is to generate electricity from either solar panels and/or a windmill by pumping water into a specialized tank mainly during daylight hours. And then during the night, the water is drained out of the specialized tank and in the process generates electricity combined with some power coming from the windmill when the wind is blowing. The system would also supply household water. The water would initially come from a near river or from a borehole drilled into an underground aquifer.

The specialized water storage tank would be conical in shape and constructed from a flexible waterproof material and as water is pumped into it through a central pipe it inflates and thus creates a hydraulic head that can be used to generate a small amount of electricity when the sun sets. The system can probably be designed without a complicated electronics. Once the tank is filled with water during the day, manually opening a water valve would turn on the electricity in the house in the evening.

It is possible that the tank could be produced in a developing country since it would primarily require “tailor” skills and the rest of the materials are probably available in a local hardware store. The price of solar panels is becoming more economic every year.