With the development of science and technology, traditional energy resources like carbon burning will finally run out and can no longer meet the need of mankind. So there comes a growing need for eco-friendly energy resources. Currently available ones include solar energy, wind energy, hydrogen energy and nuclear energy, one of the most mature of which is solar energy. Our goal is to create models which can evaluate currently existing energy storage systems and batteries and in turn help select the best one for every given house, and which analyzes cement battery’s pros and cons and incorporate it for any houses.

In the first and second models, the house is restricted to a remote and 1600-square-foot one, which means that the price to connect to the grid is too high to be taken into consideration. We evaluate each mature, existing ESS and batteries and decide it for a house whose area and number of residents are given. The models are based on XXXX. The criteria for ESS includes Continuous Power Rating and Intantaneous Power Rating, and that for batteries includes the minimum of unit cost, which is expressed as a function of battery Capacity, Reliability (the possibility of Actual Power Rating higher than Needed Power Rating) and Price Lifespan Rate. According to the criteria above, the model decides the best energy storage system and batteries for a particular home.

By generalizing and combining the two models come the following one, which includes in it the resources from grids and allow any house location and any number of residents. The impact of the former depends on the price of electricity and the distance from the house to the grid, and that of the latter is the required Continuous and Instantaneous Power Rating. With this model, we can select the energy storage system and batteries from existing popular ones for every house.

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Finally we wrote a non-technical news article describing our models which can help select for any houses the energy storage system and batteries including the existing ones and the novel cement battery.