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Flywheel Battery as a Teaching Tool in Introductory Physics COLIN CHOUDHARY, Towson Univ, JEFF KLUPT, JAMES OVERDUIN, Department of Physics, Astronomy and Geosciences, Towson University — We investigate the potential of flywheel batteries as teaching tools in introductory physics courses. A flywheel battery stores energy in the form of rotational kinetic energy. Electrical energy from other, preferably renewable sources (such as solar power during the daytime) is used to spin up a rotating mass. That energy can then be drawn off when renewable sources are not available (at night, for instance), slowing the flywheel back down. Such a project has tremendous potential, not just as a source of clean power, but also as a way of attracting the interest of students who want to use physics to build a better world. We report on the construction and testing of a classroom demonstration model in which a small flywheel is spun up using the electrical current from a solar cell, and then spun back down as current is drawn into a capacitor or series of LED indicators. We also discuss how such a proof of principle can be scaled up to something like the 40 MW flywheel energy storage facility operated by Convergent Power in Hazle, PA, within driving distance of our home institution. Finally, we share the reactions of introductory physics students upon experiencing this demonstration in class.

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