ME 440 Energy Engineering Preliminary Design

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Embry-Riddle Hydrogen

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**ABSTRACT**

Educating students about hydrogen production and storage is crucial to the future of the hydrogen economy. To accomplish the goal of hydrogen education, ERH2 proposes a hydrogen production and storage demonstrator consisting of an alkaline electrolysis unit to produce hydrogen and a material-based hydrogen storage using graphitic carbon nitride. The graphitic carbon nitride allows hydrogen to be stored without specialty equipment, saving cost and energy. The cost of the system will be approximately $1800 and operate at 20 Amps producing 0.0142 grams of hydrogen gas per minute. The electrolysis unit will have clear polycarbonate housing to make the internal components viewable, increasing the educational value. The storage will demonstrate its ability to store and release hydrogen to run the Embry-Riddle fuel cell. The proposed design is a safe and educational method to introduce students and general public to hydrogen production, storage, and economy.