

## **DATA MANAGEMENT PLAN**

### **Types of Data from the Proposed Project:**

Data that will be managed are recorded information of scientific and technical nature, regardless of form or the media on which they may be recorded. Due to its interdisciplinary nature, the proposed project is expected to generate two different types of scientific data.

First, we will produce experimental data, including Raman data of 2D materials and charge transport in 2D materials, and cell performance for both battery cells and PV cells. We will also have data from the integrated energy system such as efficiency, output power, conversion rate etc.

Second, we will have design information for integrated system acquired from an array of PV cells and performance data from the batteries. Power and area metrics will be generated from simulation, characterization, and measurements for a variety of configurations of PV cell array and processing circuitry.

### **Data Recording:**

The retention of accurately recorded and retrievable research data is important for the progress of scientific integrity. The PI and participating researchers will have responsibility for recording, retaining, and storing research data. The records will include sufficient detail to permit examination for the purpose of replicating the research, responding to questions from other researchers, establishing authenticity of the records and confirming the validity of the conclusions.

Regarding the experimental data, we will use both hard copy of experimental notebooks and electronic data in the shared drive of internally accessible server. Study title, study hypothesis, detailed information on the equipment and materials used, sources of the materials, experimental methodology, step-by-step procedures of experiments, results and conclusions will be documented in order to enable replication of the experiments. Whenever possible, raw data will be added to the Lab notebook. After the proposed project ends, bound notebooks with consecutively numbered pages will be kept in the PI's laboratory. Furthermore, raw data obtained from various experimental measurements will be electronically saved as txt files or xls files. Also, their plot and analysis results will be saved by commercial software (i.e., Excel, KaleidaGraph, etc.) or as image files (i.e., png files, jpg files, tif files, etc.). Electronic records will contain the information on data generation and modification that will allow tracking subsequent changes.

### **Data Access and Sharing:**

All participants in the project will publish the results of their work. Papers will primarily be published in peer-reviewed journals and/or conference proceedings. Journal/conference publications will be available online from respective journal websites as well as in the PIs lab. The results will be presented at conferences, such as IEEE, Electro Chemical Society (ECS), and Materials Research Society (MRS). Research documents and data will be made available immediately after publication. The data and documents will be available in the lab notebooks and also maintained in the shared drive of internally accessible server. These primary data and documents created or gathered in the process of the proposed project will be shared with other researchers at UNT as well as outside upon reasonable request and within a reasonable time of the request, at no charge to the users. When the data will be used for a patent application filed by the UNT, the original data will be kept within the University.