

**Development of Electric Vehicle Load Forecasting Techniques
for a Sustainable Future**

**Mid-Year Report Submitted to:
Seattle University
Center for Environmental Justice and Sustainability
Faculty Fellowship Program**

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1. Overview

This report describes my activities related to my AY 2013/2014 Seattle University Center for Environmental Justice and Sustainability (CEJS) Fellowship.

In April 2013 I was awarded the CEJS Fellowship for my research proposal titled “Development of Electric Vehicle Load Forecasting Techniques for a Sustainable Future”. The project seeks to develop advanced techniques for forecasting the amount of electricity used by electric vehicles (EVs) when they recharge their batteries. The project involved obtaining data from over 2,000 EV charging stations in Seattle and San Diego, and performing statistical analyses and parametric modeling. An important goal stated in the proposal is to submit an article to an appropriate peer-reviewed journal by July 2014. I am pleased to report that I have submitted such an article, and it is currently under review.

2. Progress to Date

I had originally planned to apply the course release associated with the Fellowship during Winter 2014. However, in order to better accommodate the Department’s teaching schedule, I elected to apply it to Fall 2013. This, along with a few other factors allowed my work to progress at rate faster than I had anticipated.

I began working on the research—mostly doing analysis on an existing data set—in the Summer of 2013. My research progressed quickly, however there were unexpected challenges. The main supplier of the EV charging station data (ECOTality) filed for bankruptcy protection in October 2013. I had planned on obtaining at least 6 months more data from them. It was clear that this was no longer an option. I made the decision to proceed with the research with less data. The positive side of not having to wait for more data was that I was able to begin writing the manuscript earlier. I completed the manuscript in mid-December and submitted it to the *IEEE Transactions on Smart Grid*—a top tier journal. I have attached a copy of the submitted article.

The article has been in review now for over two months, and I expect to hear the editor’s decision soon. Should the article not be accepted—there is a reasonable chance of this happening as the journal’s historical acceptance rates are 12-14 percent—there is the potential to submit to other journals, after improving it based upon the editor’s comments.

3. Other Activities

In addition to working on the proposed research topic, I also contributed to the CEJS in the following ways: I presented preliminary work in November’s CEJS meeting; I served as a mentor to a CEJS Student Fellow, Patrick Berg; and I was interviewed by Mike Schut for an article on the CEJS web site.

4. Next Steps

The manuscript was submitted on December, and in the mean time I have continued working in the research thread. The next research will consider time series analysis of the EV charging data.