

**CPET 581 Smart Grid & Energy Management
Homework 8**

Assigned Date: Nov. 1, 2013, Due Friday Nov. 8, 2013, before 5 PM.

Hand-in requirement and Due Date:

- Submit the team's "Iterative System Design Report- IV", and prepare to make the team's presentation.

Individual Assignment

- Study Nov. 1, 2013 Lecture note: grid-tied PV system, off-grid PV system, Home Area Networks, Zigbee, Smart Meters, AMI, Smart Meters and Smart Grid Architecture

(Team-based) EV & Plug-in EV Charging Station Development Project – Iteration System Design Report IV

- (A) Prepare a meeting minute for team meeting on Nov. 1; (a summary on discussion and follow-up items should be added)
- (B) Team member roles assignment: Greg – General Manager, Ryan – Co-General Manager of Marketing & Sales, Bob – Manager of System Hardware, Peter – Manager of System Software (Role unchanged)
- (C) Design a diagram that shows all major components of the conceptual new EV & Plug-In EV Charging station which should include the following subsystems (to be finalized with the refined inputs and design info from all team members)
 - a. Charging System Hardware system, with proper specification such as Charging Capacity (kWH), Voltage, Current, Level of Charging, etc
 - b. Power sources including, utility, power source, solar power rating, wind power, etc
 - c. Smart Grid Communication subsystem AMI, communication protocols, etc
 - d. User interface and service fee payment methods
 - e. Other features
- (D) Refine the team's Charging Station Selection and Recommendation and study with weighted voting from all four members and final decision (using the format as shown in CPET 575's lecture on "Design Evaluation of Alternatives"),
http://www.etc.s.ipfw.edu/~lin/CPET575_MangOfTech/2012F/Lectures/DesignEvaluationAlternatives-8-30-2012.pdf
- (E) Add team's discussion and consideration of solar power subsystem design consideration with roof-top solar panel on the charging station's parking space. (need official design and selection report - Bob)
- (F) Add team's discussion and consideration on wind power (vertical axis wind turbine, box type) on the top of the Helmke library (need official design and selection report – Bob)
- (G) Investigate and elaborate the values added with texting to smartphone, and email charging completion message, and other green energy promotion messages (considering Google texting support, need official design selection report - Peter)
- (H) Revise the Ethernet and Embedded PC on the top of Charging station electronics, also the WiFi features. (need official design report – Peter)
- (I) Prepare an estimate overall cost of the system: subsystems or modules, construction costs, others (2nd draft)
- (J) Refine team project subtasks assignment (use either Microsoft Project or Excel Spreadsheet); each team member should also create a set of needed subtasks assignment, and give a status of the progress

(K) Prepare a Report in PPT file for team discussion

References

- [1] Hope at last? California offers net metering compromise,
http://www.smartgridnews.com/artman/publish/Business_Policy_Regulation/Hope-at-last-California-offers-net-metering-compromise-6096.html/
 - a. California Assembly Bill (AB) 327
- [2] Has Austin Energy figured out a valid net metering solution? Aug. 28, 2013,
http://www.smartgridnews.com/artman/publish/Technologies_DG_Renewables/Has-Austin-Energy-figured-out-a-valid-net-metering-solution-5993.html
- [3] Smart Meters and Net Metering for PV Solar Customer, San Diego Gas & Electric,
<http://www.sdge.com/residential/about-smart-meters/smart-meters-and-net-metering>