Participation of plug-in electric vehicles in electricity and ancillary markets

Summary

TalTech School of Engineering, Department of Electrical Power Engineering and Mechatronics offers a 4-year PhD position in the field of power engineering.

Research field:	Electrical power engineering and mechatronics
Supervisors:	Prof. Dr. Ivo Palu
	Fushuan Wen
Availability:	This position is available.
Offered by:	School of Engineering
	Department of Electrical Power Engineering and Mechatronics
Application deadline:	Applications are accepted between September 01, 2020 00:00 and October 02, 2020 23:59 (Europe/Zurich)

Description

Description

With the continuous development of renewable energy generation technologies and increasing pressure to combat the global effects of greenhouse warming, plug-in electric vehicles (PEVs) have received worldwide attentions. When numerous PEVs are integrated into a power system, there may be extensive impacts on power system planning and operation, as well as on electricity market development. It is therefore necessary to properly control PEVs' charging and discharging behaviors.

Meanwhile, the vehicle-to-grid (V2G) technology could serve as the energy storage to mitigate the intermittency and uncertainty of the renewable energy generation as well as to effectively provide regulation, spinning reserve and blackstart ancillary services.

This PhD project will investigate the following problems:

- the design of an intelligent network application system for PEVs and its associate communication mechanism;
- unit commitment in a power system considering PEV applications;
- the economic evaluation and bidding strategies on PEV participations in electricity and ancillary service markets;
- optimal coordination of charging and discharging among PEVs to enhance the capability of accommodating renewable energy generation.

Qualifications

- Work experience would be strongly useful in one or several application domains, such as electricity and/or emission trading, predictive analytics, optimization methods, systems modeling, smart grids, embedded systems, and end-user energy management applications.
- The applicant must itself propose in application an approach to the topic incl. mix of themes and activities that align to the proposed PhD topic that she/he wish to pursue incl. analysis methods and evaluation criteria's that best reflect the objectives and challenges of the proposed topic.

The applicants should fulfill the following requirements:

The topic is suitable for a student with excellent English language skills and a master's degree in areas like electrical power engineering, energy economics, computer science or applied mathematics.

To get more information or to apply online, visit https://taltech.glowbase.com/positions/143 or scan the the code on the left with your smartphone.