

SYLLABUS: APS 510

“Innovative Technologies and Organizations in Global Energy Systems”

Fall Term 2014

**Updated August 18, 2014**

**Meets:**    **Main Lecture Session:** Tuesdays 4:10 to 7:00 pm in BA1240

**Tutorial (includes quizzes in some sessions):** Mondays 9:00 am to 10:00 am (meets most weeks) in HA401.

**Startup: First class will be on Tuesday, September 9 starting at 4:10 pm in BA1240 – all students should attend.** Prof. Vehovec will be available in the tutorial room HA401 on Monday, September 15 from 9:00 am to 10:00 am to answer any questions about the course.

**Instructor:** Henry Vehovec, P. Eng., MBA, ICD.D  
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Prof. Vehovec Office Hours - please email for an appointment  
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**Special Course Associate:**

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### **Calendar Description:**

This course presents and discusses a broad range of global energy systems (including electricity generation, electricity end use, transportation and infrastructure) that are emerging based on two key trends: (a) the increasing ability to deploy technologies and engineering systems globally, and (b) innovative organizations, many driven by entrepreneurship (for profit and social) and entrepreneurial finance techniques. The course considers these types of innovations in the context of developed economies, rapidly developing economies such as India and China, and the developing world. The course will interweave a mix of industry examples and more in-depth case studies. The result will be a matrix (not necessarily completely filled in) along the three dimensions of type of technologies, types of organizational structure, and development level of the country or region. The examples and cases are examined with various engineering, business and environmental/sustainability analysis perspectives.

### **Target Audience:**

- This is intended as a 500 level course, for master's students and fourth year undergrads. Ph.D. students welcome.
- This course is intended for students with a strong interest in energy systems and/or an interest in multiple global contexts of engineering work and/or entrepreneurship and technology-based organizations.
- This course could be of interest to students in other Faculties, such as Rotman and the Munk School of Global Affairs.

### **Prerequisites:**

- This is intended as a 500 level course, for master's students and fourth year undergrads. It assumes most students will have had courses and other exposure to the engineering aspects of various energy systems, but there is no specific technical prerequisite.
- It would also be useful if the students had completed the UofT required engineering economics course, or the equivalent.

### **Planned Format and Schedule:**

- The course will be built around a series of case studies. It will also consist of lectures by the instructor and guest speakers, class discussion, and work on a team project. Students can optionally set up a LinkedIn account to participate in the online discussions in the closed group, APS510. There may be opportunities to participate in site visits or industry conferences off campus. Students will be graded on their participation in class discussions and other activities.
- One 3-hour session and one 1-hour tutorial per week for 13 weeks. In general three hours each week will be lecture and case analysis/discussion (for a total of

39 hours of classroom time), with the 4th hour being used as a tutorial used for clarification, in-class quizzes and written assignments, and/or work on the group project.

- Students will need to be able to attend all of the main 3 hour class each week – **if you have an ongoing conflict during part of that time unfortunately it will not work to take this course.** It is highly preferable if you are also conflict-free for the tutorial, but special arrangements in some cases may be possible if you have an ongoing conflict then – see T.A.
- **Auditors:** A limited number of auditors will be accepted if space allows, with the permission of the instructor. This is an interactive class, so auditors must commit to doing all the readings, participating in class discussions, **attending the great majority of class sessions every week, and attending for the whole term. It will not work for auditors to “pop in” from time to time, and auditing in that mode will not be permitted.**

### **Course Materials:**

- Course materials will include case studies such as those published by Harvard Business School Press (<http://cb.hbsp.harvard.edu/cb/access/15460220>), excerpts from textbooks and other books, articles from academic journals and from popular business media such as The Economist and The New York Times.
- When possible the materials will be made available online through the course web site. In some cases readings may be distributed in hard copy form in class, or ‘mini-readers’ containing selected articles may be made available for purchase by the students.
- The sequence of assigned cases and readings will follow the Course Schedule (see below) but will also be announced on an evolving basis in class and on the course website.
- **Please respect the copyright protection of the case studies, readings and other items provided.** Students are not to distribute copyrighted materials electronically or in hard copy form.

**Grading:**

- 20% - Multiple in-class quizzes and short written assignments
- 20% - Midterm exam
- 20% - One team project (4 students per team) on a complex energy system of the type discussed in this course
- 30% - Final exam
- 10% - Class participation

**Course Schedule; Sequence of Cases:** Please see the accompanying *Course Schedule*, which will be updated online as the term goes on.