

Three Essentials of the Electric Grid, Module C: Business Essentials

The Environmental Law Center, Vermont Law School
Summer Session 2019, Term I, ENV5511

Instructor

Joe Halso
Associate Attorney
Sierra Club Environmental Law Program
joe.halso@sierraclub.org (please put “ENV5511” in the email subject line)
313-590-1720
Campus office: #208 Eaton House

Course overview

This one-credit course is the third module in *Three Essentials of the Electric Grid*, a three-part overview of the engineering, legal and business dimensions of the U.S. electricity sector.

Students may enroll in this module (Module C: Business Essentials) even if they have not taken the other two modules.

Electric vehicles (EVs) are at once an emerging and disruptive technology, a key piece of the climate puzzle, and a remarkable business opportunity for electric utilities. This module will explore issues at the intersection of the rapidly changing electricity and transportation sectors, with a particular focus on how EVs fit into the utility business model and can support a smarter, cleaner, more efficient “grid-of-the-future.”

Course Schedule & Location

This course consists of four three-hour sessions. We will begin on Monday, June 10 and will conclude on Thursday, June 13. We will meet each day from 1:00 – 4:00 PM in Oakes Hall, #208.

Course Objectives

To have students understand:

- The need to plan for the electrification of our transportation system;
- The state of the EV and EV technology markets, as well as state and federal policy drivers for transportation electrification;
- The opportunities and challenges that lie at the intersection of the transportation and electricity sectors for electric utilities, their regulators, EV market participants and stakeholders, and the policy approaches that have been pursued to date;
- How to identify, understand and analyze issues within different legal and policy approaches in the transportation space; and
- The interests and motivations of the diverse stakeholders in the transportation and energy fields.

Course Requirements and Grading

Our class sessions will be organized around lectures, discussion, exercises and simulations.

Preparation for, attendance at, and active participation in every class session is expected. Please read the assigned readings for each class in advance of that class.

Grades will be determined by class participation (20%), homework to be assigned in class on Monday and Tuesday (10%), a class presentation to be assigned on the first day (20%), and a take-home final exam (50%).

The take-home final exam will be made available at 8:00 AM ET on the morning of Friday, June 14 and must be completed by 12:30 PM ET on Sunday, June 16.

Reading Materials

There is no textbook for this course.

The readings for each class are listed below, and **all** readings are accessible on the TWEN site for this course in the “Course Materials” tab. The course materials are also accessible on google drive using this link:

<https://drive.google.com/open?id=1TKzDTuvDESjmlINPtyaOG1TqPtufe-SY>

Two notes: First, pay close attention to the reading assignments. In many cases I have assigned only specific sections for you to read, rather than the entire piece. **Second**, the readings are meant to be completed in the order listed for each class session.

Overview of classes and reading assignments

Class #1 (Monday, June 10)

Setting the stage: transportation and the grid

Our first class will focus on the transportation pollution problem, the need to electrify, and the potential for EVs to support a cleaner and smarter grid. We will talk about the various market players and value streams in the EV marketplace, and the grid services that EVs can provide through successful “vehicle-grid integration,” as well as the technology, infrastructure and regulatory challenges that may stand in the way. I will also assign the class presentation and first homework assignment.

Readings for Class #1

Background: the EV and EV charging markets

Bloomberg New Energy Finance, *Electric Vehicle Outlook 2019: Executive Summary* (May 2019).

McKinsey & Company, “Charging Ahead: Electric Vehicle Infrastructure Demand,” (October 2018).

Transportation pollution and the need to electrify...or not

David Vox, “The Key to Tackling Climate Change: Electrify Everything,” Vox (October 27, 2017).

Jonathan Lesser, “Are electric cars worse for the environment?,” Politico (May 15, 2018).

The utility business model and EVs, Part I: traditional utility incentives

Travis Kavulla, Excerpt from “There Is No Free Market for Electricity: Can There Ever Be?,” American Affairs (May 20, 2017).

Vehicle-Grid Integration

Illinois Citizens Utility Board, *The ABCs of EVs: A Guide for Policy Makers and Consumer Advocates* (April 2017), **please read pages 3-4, 18-22.**

Rocky Mountain Institute, *Driving Integration: Regulatory Responses to Electric Vehicle Growth* (2016), **please read pages 14-21.**

Class #2 (Tuesday, June 11)

God is in the detail: designing utility-driven EV programs

Our second class will focus on the utility role in the deployment of EV charging infrastructure. We'll consider the justifications for utility investment in this space, where utilities should focus their efforts, and how regulators might judge those investments. We will also consider the perspectives of various interested stakeholders.

Readings for Class #2

Weighing the regulator and utility roles

Illinois Citizens Utility Board, *The ABCs of EVs: A Guide for Policy Makers and Consumer Advocates* (April 2017), **please read pages 6-8 and 24-28 (beginning with section titled “Jurisdictions are Beginning to Authorize Customer-Funded Charge Stations”)**.

Defining the roles for regulators and utilities (among others)

Declaratory Ruling on Jurisdiction Over Publicly Available Electric Vehicle Charging Stations, Case 13-E-0199, In the Matter of Electric Vehicle Policies (filed November 22, 2013), New York Public Service Commission.

Excerpts from *Orders* issued by the Massachusetts Department of Public Utilities and the Minnesota Public Utilities Commission. **(combined as single PDF—please read all pages)**.

Designing utility-driven electric vehicle programs

Sierra Club, Excerpt from *Comments* submitted to the Wisconsin Public Service Commission (May 2019).

Natural Resources Defense Council, *Guiding Principles for Utility Programs to Accelerate Transportation Electrification* (August 2017).

The utility business model and EVs, Part II: performance-based ratemaking

Regulatory Assistance Project, Excerpt from “Innovative Ratemaking and Rate Design,” by David Littell at the Keystone Energy Alliance 7th Annual Conference (October 2017).

Class #3 (Wednesday, June 12)

Enabling the future: state and federal policy drivers for EVs

Our third class will consider how efforts at the state, regional, and federal levels are advancing transportation electrification, including pollution and fuel economy standards, incentive policies, and the implementation of the settlement resulting from Volkswagen's "dieselgate" scandal. We will also consider the impact of the Trump administration.

Readings for Class #3

"Cooperative" federalism: efficiency, emissions standards and the California waiver

Congressional Research Service, *Vehicle Fuel Economy and Greenhouse Gas Standards: Frequently Asked Questions* (May 2018), **please read the "summary" and pages 1-6.**

Nadja Popovich, "California Is Ready for a Fight Over Tailpipe Emissions. Here's Why." *New York Times* (April 30, 2018).

Clean Air Act, Section 177.

State and regional efforts

ICCT, *Evaluation of State-Level U.S. Electric Vehicle Incentives* (October 2014), **please read pages 3-6 and 29-30.**

Governor Jared Polis, Executive Order B-2019-002, "Supporting a Transition to Zero Emission Vehicles" (January, 2019).

Catherine Morehouse, "Colorado Gov Polis unveils roadmap to 100% carbon free by 2040, signs 11 clean energy bills," *Utility Dive* (June 3, 2019), **please read article text, and simply skim the bills listed in the second half of the article.**

Automaker bad behavior: the Volkswagen settlement and future enforcement

Sierra Club, Volkswagen Settlement Overview.

Comments of faith-based, environmental, energy, and citizen organizations on the Missouri Department of Natural Resources' *Draft VW Mitigation Plan*.

Class #4 (Thursday, June 13)

“What’s next?”: the future of mobility and the grid

For our final class, we will spend the first half talking about disruptive policy and innovation at the utility and state level, as well as system-wide. The second half of the class session will be spent on class presentations. Finally, the take-home final exam will be explained.

Readings for Class #4

The utility business model and electric vehicles, Part III

Mike O’Boyle, “Can a ‘DER Authority’ fix the utility information problem to boost clean energy?” Utility Dive (July 30, 2018).

Disruptive policy

Chris Morris, “A California Lawmaker Is Trying to Ban all Gasoline-Powered Cars in the State by 2040,” Fortune (December 6, 2017).

Clean Cars 2040 Act (Assemblymember Ting).

Elliot Henry, *Engine Manufacturer's Association v. South Coast Air Quality Management District: Using Market Participation to Achieve Environment Goals*, ECOLOGY LAW QUARTERLY, VOLUME 35, ISSUE 3, ARTICLE 16 (JUNE 2008).

Disruptive innovation

Rocky Mountain Institute, Executive Summary of “Peak Car Ownership: The Market Opportunity of Electric Automated Mobility Services” (2016), **please skim each of the eight “key findings.”**