

Time/Location: Tuesday, 5:00-7:30 PM, Distance Learning

Instructors:

Arthur J. Harrington, Adjunct Professor, Marquette University Law School
Dr. Ayman EL-Refaie, Professor, Electrical Engineering, Opus College of Engineering
Noelle Brigham, P.E., ENV SP, Professor of Practice, Opus College of Engineering

Course Description:

This multi-disciplinary course will focus on the legal policy, technical framework, and sustainability for electrical energy project development in Wisconsin. The course will cover the following legal policy topics: corporate structuring, financing, taxation, permitting and strategies to support and oppose such projects. The course will provide a general overview of technical considerations for emerging renewable technologies in Wisconsin such as biomass, waste to energy, geothermal, solar and wind projects.

In addition, sustainable development aspects of renewable energy projects will be introduced to identify impacts to the triple bottom line (social, environmental, and financial). This course is cross listed in the Law and Engineering College to create a diverse classroom and foster a collaborative approach to developing +renewable energy projects, consistent with legal and technical partnerships that occur in practice.

Course Objectives:

By the conclusion of the course, each student is expected to achieve the following:

1. Describe the role of environmental, energy regulations, and technology in energy project development.
2. Explain the role that tax law and state/federal approvals apply to energy project development.
3. Define emerging renewable energy technologies including wind, solar, hydro and biogas.
4. Apply tools to characterize the sustainability aspects of a project to inform decision making.
5. Develop strategies to support or oppose an energy project.
6. Understand the intersection of the legal and engineering professions to support a successful renewable energy project in Wisconsin.

Course Materials:

- Energy Law by Alexandra B. Klass and Hannah J. Wiseman, Foundation Press, 2020.
- Peake, Stephen ed. (2017). Renewable Energy: Power for a Sustainable Future (4th Ed.). Oxford: Oxford University Press.

Grading (% of final grade):

For homework, class project, and mid-term exam questions in the technology and sustainability topics, Professor Harrington will prepare and grade questions that pertain to the Law Students. In parallel, Professors EL-Refaie and Brigham will prepare and grade questions for the Engineering Students.

- Class Participation and Homework (60%)

Attendance for all classes is mandatory. See absence policy in this syllabus for missed classes.

Homework assignments and due dates will be uploaded to D2L. Homework will generally include readings, written interpretations, and problem solving based on the lecture material. With an interdisciplinary class, homework assignments will be tailored to the perspective of the student (legal or technical) to create multiple perspectives on a common topic. For example, an assignment may contain options for technical engineering and legal questions for the students to respond.

- Class Project (25%)

Each student will be required to prepare and submit a paper to discuss strategies relating to a hypothetical proposed small-scale energy project in Wisconsin (“Hypothetical Project”). The paper will discuss the strategies for permitting, financing, and siting the Hypothetical Project. The paper will also discuss likely strategies that will be encountered in parties opposing the facility and techniques to mitigate those anticipated opposition strategies (Paper Project).

The student will be required to provide a presentation on topics relating to one of following: financing, permitting, siting considerations, technical considerations, sustainability, corporate structuring, taxation (Presentation Project). A summary of the Hypothetical Project is available on D2L. The presentation questions will be provided after the course mid-term and the student presentations will be made during the final week of the course. The questions will contain a variety of perspectives (legal, technical) for the students to respond.

- Mid-Term Exam (15%)

The course will have a mid-term exam. The exam will incorporate perspectives from both the legal and technical disciplines.

- Grades will be based on the following scale:

100 - 93	A
92 - 90	A-
89 - 88	B+
87 - 82	B
81 - 80	B-
79 - 78	C+
77 - 60	C
<60	F

- Class Policies:

- Homework: All homework and projects are due on the dates listed on the assignment and D2L. Each student is required to complete all assignments to receive a course grade. Late assignment grades will be reduced by 10 points per week late unless an extension or accommodations are granted prior to the due date on a case-by-case basis. An assignment is considered 1 week late if it is not received by the class meeting time on the due date.
- Absence: Prior arrangements can be made with the instructor for missed classes. All students are expected to attend synchronous lectures unless prior arrangements are made with the instructor. Missed work will be rescheduled on a case-by-case basis. In general, the student should expect to make up work within a week of the absence. Students missing more than two (2) scheduled classes will be administratively withdrawn from the course with a grade of an "F".
- Re-grade: If you believe something on the homework or exam was incorrectly graded, a request to be re-graded must be made within 1 week of the returned homework or exam.
- Technology Requirements:
 - Students are expected to have videos on during class, with additional participation through verbal / microphone, and chat window during class meetings.
 - To be successful in this course, you will need to have foundational experience with D2L, the University's Learning Management System, and the videoconferencing tool Microsoft Teams. If you're not familiar with these technologies, review the [D2L Student Help resources](#) and [Students Use Microsoft Teams for online/live classes webpage](#).
 - The [Technology for Remote Learning webpage](#) contains information on the technology you will need to be successful. For general questions about technology, contact the ITS Help Desk at helpdesk@mu.edu or 414-288-7799.

Academic Integrity and Honor Code:

<https://bulletin.marquette.edu/grad/policiesofthegraduateschool/#academicintegrity>

<http://bulletin.marquette.edu/undergrad/academicregulations/>

<http://www.marquette.edu/provost/integrity-index.php>

Special Statement on COVID-19:

Marquette University recognizes that this is a difficult time which may be filled with uncertainty as we move forward with the academic year. The University has the following resources and information available for our safety and well-being and to achieve our academic goals (links to web pages below). We will work together to navigate these extraordinary and challenging times.

- [Marquette COVID-19 Response webpage](#)
- [Student Resources](#)

Tentative Schedule (subject to change):

Week	Topics	Assigned Readings	Instructor
1 1/26	Class Introductions Legal / Policy Course overview. Overview of energy and environmental regulations for energy projects. Overview of administrative law/judicial review principals.	<ul style="list-style-type: none"> • <u>Energy Law</u> Klass and Wiseman. Pages 1 - 7. 	Noelle Brigham Art Harrington
2 2/2	Technology Course overview. Introduction of different types of renewable energy sources. LCOE. More in depth introduction of wind energy.	<ul style="list-style-type: none"> • Class notes • RENEWABLE ENERGY "Power for a Sustainable Future." Chapter 1 	Ayman EL-Refaie
3 2/9	Law Student Seminar #1 Mental Health Day – (Engineering Students Optional)	Topics: <ul style="list-style-type: none"> • <i>Overview of the 2020 Energy Act</i> • <i>Practical Perspectives on Assembling Energy Deals</i> 	Art Harrington Guest Lecturers: John Mitola President Juhl Energy Inc. Clay D. Norrbom Managing Director Juhl Clean Energy Assets, Inc.
4 2/16	Sustainability Global Sustainable Development Challenges: Climate Action and Affordable Clean Energy	<ul style="list-style-type: none"> • Class notes • United Nations Sustainable Development Goals • Wisconsin Greenhouse Gas Reduction Goals 	Noelle Brigham
5 2/23	Overview of federal and state environmental permitting for renewable energy projects.	<ul style="list-style-type: none"> • <u>Energy Law</u> Klass and Wiseman. Pages 97, 111 – 130. 	Art Harrington
6 3/2	Principles of wind energy	<ul style="list-style-type: none"> • Class notes • RENEWABLE ENERGY "Power for a Sustainable Future." Chapter 7 	Ayman EL-Refaie

Week	Topics	Assigned Readings	Instructor
7 3/9	Role of Renewable Energy in Reducing Carbon Emissions	<ul style="list-style-type: none"> Quantifying carbon emissions Carbon reduction strategies Renewable energy credits 	Noelle Brigham
8 3/16	Overview of FERC and PSC regulations for energy projects.	<ul style="list-style-type: none"> Public Service Commission of Wisconsin and Department of Natural Resources, <i>Application Filing Requirements Electric Generation Projects in Wisconsin</i> (Oct. 2017). <u>Energy Law</u> Klass and Wiseman. Pages 165 – 181 and 187 – 196. 	Dave Gilles, former General Counsel of PSC
9 3/23	Mid-Term Exam		
10 3/30	Principles of solar photovoltaics	<ul style="list-style-type: none"> Class notes RENEWABLE ENERGY “Power for a Sustainable Future:” Chapter 3 	Ayman EL-Refai
11 4/6	<p>Financial Industry Perspective of Reducing Carbon Intensity in Energy</p> <p>Overview of electrical transmission, distributive generation cyber security and available tariffs for industrial customers</p>	<ul style="list-style-type: none"> Topic: Sustainability strategy for a competitive advantage <u>Energy Law</u> Klass and Wiseman. Pages 73 – 90. 	<p>Noelle Brigham and Guest Lecture: John Ferguson, CFA Senior Vice President, Northern Trust</p> <p>Art Harrington</p>
12 4/13	<p>Principles of solar thermal</p> <p>Part I - Sustainable Infrastructure: ENVISION Rating System for Energy Projects</p>	<ul style="list-style-type: none"> Class notes RENEWABLE ENERGY “Power for a Sustainable Future:” Chapter 2 ENVISION Workshop Materials 	<p>Ayman EL-Refai</p> <p>Noelle Brigham</p>

Week	Topics	Assigned Readings	Instructor
13 4/20	Law Student Seminar #2 Mental Health Day – (Engineering Students Optional)	Topic: Renewable Energy Integration in the Electrical Rate Structure – <i>Consumer and Industrial Customer Perspectives</i>	Guest Lecturers: Tari Emerson, P.E., Director of Energy Charter Steel Tom Content Executive Director Wisconsin Citizens Utility Board
14 4/27	Overview of structuring energy projects, financing and taxation of renewable energy projects Part II - Sustainable Infrastructure: ENVISION Rating System for Energy Projects	<ul style="list-style-type: none"> • <u>Energy Law</u> Klass and Wiseman. Pages 139 – 164. ENVISION Workshop Materials	Art Harrington Noelle Brigham
15 5/4	Principles of hydro, wave and tidal power	<ul style="list-style-type: none"> • Class notes • RENEWABLE ENERGY “Power for a Sustainable Future.” Chapters 5,6,8 	Ayman EL-Refai
16 5/11	Class Project Presentations 5:45 – 7:45 PM (NEW Class Meeting Time)		