



FACULTY OF ENVIRONMENTAL AND URBAN CHANGE  
YORK UNIVERSITY

Environmental Studies Graduate Course Outline/Syllabus

ENVS/EUC 5050: Fundamentals of Renewable Energy: Theory, Policy and Practice  
Fall 2024

*Note.*

This course can help you achieve 3 York U credits towards your degree, and also can be used to foster the development of your graduate and professional education (for details, please discuss with Course Director)

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**Course Director**

Dr. José Etcheverry

**Course Team**

Codrina Ibanescu, External Educational Advisor

Rosario del Pilar Rodriguez Romani, Teaching Assistant

**Course Email Contact Information**

ireahr@123mail.org

**Course Times and Location**

Class = Friday 11:30 am – 2:30 pm – Hybrid (September-October)

In person at HNE 035 (November-December)

Office Hours = Wednesday 10 am to 12 pm @ HNE 262

**Official Course Description**

The course is designed to provide students with a critical understanding of key renewable energy options for electricity generation, heating and cooling of buildings and transportation. Students will be introduced to a critical analysis of renewable energy as a strategy for climate change mitigation, community empowerment, industrial development, and energy security.

### **Graduate Focus:**

This course is integrated with ENV5/EUC 4400 so you will have practical opportunities to work with Undergraduate students, high school students and also to expand your graduate research focus by working beyond the classroom with key renewable energy experts such as Fred Schwartz from California

### **Expanded Course Description (Overview and Learning Objectives)**

We will start our course by meeting via zoom on Friday September 6<sup>th</sup> at 11:30 am which will allow us to learn about each other and, thereafter, plan our educational strategy for the rest of the term. During the first class we will create a WhatsApp Group to share resources and provide interactive updates about field trips, meetings and professional opportunities. Our course harnesses a very practical approach designed to provide you with real opportunities to learn how to design renewable energy systems and building new installations in our Climate Solutions Parks locations in 70 Canuck Avenue in Toronto's Downsview Park and at 144 Fox Street in the Ecology Garden of Penetanguishene (for a summary of CSP 1 please see: <https://vimeo.com/449672681> ).

Please also note that this course (and subsequent courses that will be offered by our team in 2025) can also prepare you to do practical renewable energy work in our amazing Eco-Campus of Las Nubes in Costa Rica.

### **Course Readings/Resources**

To reduce your financial costs and to eliminate the use of paper we will only use digital readings in our class. Please see below our course's key readings/resources (note that hyperlinks and additional readings will be posted in our E-Class Site before each class).

#### **Earth Charter**

(Available at: <https://earthcharter.org>)

#### **UNSDGs**

(Available at: <https://sdg-tracker.org>)

#### **Status of Renewable Energy Worldwide**

(Available at: <https://www.ren21.net>)

#### **RETSCREEN Expert**

(Available at: [www.etscreen.net](http://www.etscreen.net))

#### **Joint Declaration on 100% Renewable Energy**

(Available at: <https://global100restrategygroup.org>)

#### **The World's Renewable Energy Leaders (RE100)**

(Available at: <https://www.there100.org>)

## Evaluation: Grading and Course Requirements

### Course Requirements:

1. Attend all classes and visit the e-class site regularly to read required and updated readings
2. Collaborate with other course members and course guests using a convivial approach
3. Be flexible and participate in a collaborative manner throughout the course

### Course Deliverables: Grading (% of Course Grade)

1. Proposal for Individual Research Paper (15% -Due October 11, 2024)
2. Final Individual Research Paper (35% -Due November 29, 2024)
3. Proposal for Team Work (15% - Due October 25, 2024)
4. Team Work Report (35% - Due December 3, 2024)

### Detailed Instructions for Course Deliverables

#### 1. Proposal for Individual Final Paper

The proposal is your opportunity to explore and conduct in-depth research on a renewable energy topic of your choice using an interdisciplinary approach

The proposal has to:

- A. Describe the subject of your proposed renewable energy research topic
- B. Provide a brief section-by-section outline of the proposed final paper (including page targets for each section e.g. Introduction...1 page; Literature review...3 pages; etc.)
- C. Include a literature review (i.e. written in the form of an annotated bibliography).
- D. Incorporate concepts/reflections and linkages from the Earth Charter and UNSDGs that will be harnessed by you to guide the development and content of your Final Individual Research Paper

Literature reviews are a key tool to guide your research and are widely used in academic research. We have included this component to ensure that you can become a strong scholar. In your proposal, the literature review will take the form of an **annotated bibliography** containing the most recent and salient peer-reviewed sources (i.e. from the most recent and most relevant academic texts and peer-reviewed journal articles related to your proposed topic). We ask you to focus only on the peer-reviewed literature to ensure that you can produce academic work of high quality and strong validity.

The maximum length of the proposal is **800 words**, excluding the annotated bibliography and any images, maps, charts, appendix/es.

The annotated bibliography should include **at least 10** of the most recent peer-reviewed references of your proposed topic and should include at least two-three sentences summarizing each entry and explaining the relevance of each research source selected (please contact a Research Librarian if you need help determining the salience of peer-reviewed sources).

Your proposal must be written by you using a formal academic style and be fully referenced (i.e. including graphs/pictures/etc.). Therefore, it is advised that you follow the referencing style used in a peer-reviewed journal that you like and where you may want to publish your work

Tip.

Get the latest edition of 'Proposals that Work' which was written by Lawrence Locke, Stephen J. Silverman, and Waned Sporous

Due Date = October 11, 2024 by email to [ireahr@123mail.org](mailto:ireahr@123mail.org)

## 2. Final Individual Research Paper

The Final Individual Research Paper provides you with an opportunity to expand on the topic that you selected in your proposal and will allow you to incorporate and expand on the suggestions provided as part of the evaluation of your proposal. Your research paper will also allow you to explore in detail a topic that you want to learn lots about and, ideally, could become a strong foundation for subsequent professional and/or academic work in the field of renewable energy. Also, you may want to look at the paper as your own opportunity to enter the world of renewable energy with a strong foundation on an area that intrigues you today and within a specific community context that you may want to contribute to with your research and professional skills.

The research paper should expand on what you discussed in your individual proposal (it is understood by us that the scope, purpose and structure may change as your thinking and research base evolves throughout the term and, also, as you review and reflect on our suggestions to improve your proposed research).

The research paper will be a maximum of ~ **2,000-4,000** words, it must be written by you, well edited, written in a formal academic style and also be fully referenced (it is advised that you follow the referencing style used in a peer-reviewed journal of your choice e.g. *Energy Policy*).

The report must include an introduction, setting out the scope of the report and the importance of the subject to the course themes and the conclusion must summarize key ideas, policy implications, areas for further research, and any lessons learnt.

Due Date = November 29, 2024 by email to ireahr@123mail.org

### 3. Proposal for Team Work

For this course deliverable, you are required to work in a team of at least 2 people that share affinity in working together on a renewable energy topic that is of common interest to all your team.

We will form our course teams during the classes in September and October as possible team topics are presented during the course (e.g. by guest speakers and previous generations of students that have worked well together designing and developing our climate solutions parks).

The Team Work Proposal shall:

- A. Describe the subject of your proposed research/topic/practical project
- B. Provide a brief section-by-section outline of the proposed report (including page targets for each section)
- C. Include a literature review (i.e. written in the form of an annotated bibliography).
- D. Incorporate concepts/reflections and linkages from the Earth Charter and UNSDGs

(Big tip: focus on a **realistic and achievable** project that will focus on a renewable energy solution that interests your team and/or a practical initiative that will help improve our Climate Solutions Parks and/or that advances your undergraduate/graduate education and/or professional work)

As stated earlier, Literature Reviews are a key tool to guide academic research and professional work. In the proposal, your team's literature review will take the form of an annotated bibliography containing the most recent and salient peer-reviewed sources (i.e. from the most recent and most relevant academic texts and peer-reviewed journal articles related to your proposed topic).

The maximum length of the proposal is **800** words, excluding the annotated bibliography and any appendix/es.

The annotated bibliography should include **at least 10** of the most recent peer-reviewed references that inform and contextualize your team's proposed topic/focus and should include at least two-three sentences summarizing each source and explaining the content, validity and relevance of each research source selected.

The proposal must be co-written and edited by team members using a formal academic style and must be fully referenced. Therefore, it is advised that you follow the referencing style used in a peer-reviewed journal that your team likes (and where you may want to publish your team work).

Your proposal **must also** include an Appendix explaining the current and planned contribution/s of each group member (e.g. Paula Perez: will conduct background research, write and edit written report; Juan Gonzales: provided annotated research sources and will write and edit written report; etc...).

Please note that a key pedagogical goal of the Appendix is to help **ensure an equitable distribution** of group tasks and a fair evaluation of each team member.

Due Date = October 25, 2024 by email to [ireahr@123mail.org](mailto:ireahr@123mail.org)

#### 4. Team Work Report

The Team Work Report is your team's opportunity to produce a memorable written and visual account of the work and/or topic that was selected during the Team Work Proposal stage.

Please think also of the team report as your own opportunity to develop a practical and tangible deliverable that can open doors when you are seeking new opportunities and/or employment in the renewable energy sector.

Also, since we are lucky to have climate solutions parks available to do practical work this could be a great opportunity to build and develop something useful for the local community, your family and friends and that you can be proud to showcase here in Canada and/or in the Eco-Campus of Las Nubes in Costa Rica.

The team report should be about 2,000-4,000 words, please make sure that it is well edited, written in formal academic style and fully referenced (it is suggested that you follow the specific referencing style used in a peer-reviewed journal that you may be interested in publishing your work and/or that you like to read).

The report must include an introduction, setting out the scope of the report and the importance of the subject to the course themes and a brief conclusion that summarizes key ideas and/or lessons learnt.

Your report **must** include an Appendix explaining the contribution/s of each group member (e.g. Paula Perez: will conduct background research, write and edit the written report; Juan Gonzales: provided annotated research sources and will write and edit the written report; etc....).

Note that a key pedagogical goal of the Appendix is to **help ensure an equitable distribution/allocation** of all group tasks and therefore ensure accountability and a fair evaluation of group and individual work.

Due: December 3, 2024 by email to ireahr@123mail.org

### **Course Outline**

(please visit our e-class frequently to access the readings and hyperlinks for the required readings specified below and for any additional readings provided before our class)

#### **September 6, 2024**

**(Please note that this will be a virtual class using zoom)**

Introduction to our Course

During this class, we will discuss strategies to ensure that the course can proceed as planned. Our plans need to take into consideration your own personal circumstances and background to ensure that we achieve, as much as possible, the practical experiential learning approach that will characterize our course.

#### **September 13, 2024**

**(Please note that this will be an in-person class)**

Foundations of our Course and Tour of Energy Facilities of York University

Guest Speaker and Tour Leader: Codrina Ibanescu

Codrina Ibanescu is the President of the Rural Urban Learning Association of Canada

Introduction to the 100% Renewable Energy Paradigm, Work-Integrated Learning (WIL) Principles, The United Nations Sustainable Development Goals (UNSDGs), and the Earth Charter

### **Required Readings:**

[100% Renewable Energy +WIL](#)

[UNSDGs](#)

[Earth Charter](#)

[Energy Management @ York University](#)

For Understanding the Earth Charter as an Operational System for the UNSDGs:  
Please download: [Maptiong](#)

**September 20, 2024**

**(Please note that this will be a virtual class using zoom)**

Strategies to Develop Renewable Energy at the Local Level

Guest Speaker: Professor Fred Schwartz

The Solar Valley Consortium, University of California Riverside; history, targets, activities, strategy, themes

**Required Readings:**

[100% Renewable Energy](#)

Launching Solar Valley, and Why Riverside and San Bernardino Should be Solar Valleys

<https://www.cert.ucr.edu/new-federal-energy-policy-what-should-it-look-southern-california>

**September 27, 2024**

**(Please note that this will be a virtual class using zoom)**

Introduction to Renewable Energy Software Tools

Guest Speaker: Greg Leng

Greg Leng is the inventor and developer of RETScreen and RETScreen Expert

**Required Readings:**

[RETScreen Expert](#)

[Helioscope](#)

**October 4, 2024**

**(Please note that this will be a virtual class using zoom)**

Fundamentals of Renewable Energy Policy

The Roles of Policy and Finance or how California Leads by Example

**Required readings/resources:**

[Policy](#)

Solar Valley 2022 Conference Keynote with Siva Gunda, and the Net Energy Metering

Panel: <https://www.youtube.com/watch?v=suFKIXv-vUb>

Solar Valley Complement Video Series with Laurie ten Hope

<https://www.cert.ucr.edu/complement-video-series>



**October 11, 2024**

Financing Renewable Energy

**Required Reading:**

[Finance](#)

**October 18, 2024**

Reading Week = no class

Integrating the Local Community into the Design, Implementation and Maintenance of Renewable Energy Projects

**Required Reading:**

[Community](#)

**October 25, 2024**

Introduction to Solar Energy

Guest Speaker: Steve Heckeroth

Steve Heckeroth is a California-based solar architect and the inventor of the world's first commercial electric tractor

**Required Reading:**

[Solar](#)

**November 1, 2024**

Introduction to Wind Energy

Guest Speaker: Stefan Gsänger

Stefan Gsänger is the Secretary General of the World Wind Energy Association

**Required Reading:**

[Wind](#)

**November 8, 2024**

Introduction to Renewable Energy Storage and Micro-Grids Solutions

Guest Speaker: Jonathan Cheszes

Jonathan Cheszes is a Board Member of Compass Energy Consulting a Canadian company that specializes in renewable energy storage solutions

**Required Readings:**

[Storage](#)

Solar Valley Complement Video Series: Steven Strong and Dr. Alfredo Martinez-Morales  
Part 1

<https://www.cert.ucr.edu/complement-video-series>

Microgrid Knowledge web site: <https://microgridknowledge.com/>

<https://microgridknowledge.com/video/electric-reliability-why-the-grid-is-no-longer-enough/>

**November 15, 2024**

Building Back Better: Local Manufacturing of Renewable Energy Products

Guest Speakers: Archie Haslauer and Henry Reinelt

Archie Haslauer and Henry Reinelt are the owners of Kinetic Solar, an Ontario-based manufacturing firm that specializes in making products for the solar industry

Required reading:

[Manufacturing](#)

**November 22, 2024**

Renewable Energy Educational Opportunities and their Role in Local Capacity Development

Guest Speaker: Andrew Cahill

Andrew Cahill works for Relay Education, a leading Canadian NGO that specializes in training the next generation of renewable energy leaders

**Required Reading:**

[Education](#)

**November 29, 2024**

**Last Class of this Term**

Reflections on forthcoming trends of the renewable energy sector in North America and Worldwide

**Important Course information**

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage available at: <https://www.yorku.ca/secretariat/>

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

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