

Course Syllabus

ISEN 411: ESG, Reporting and Tools for Energy & Sustainability (1.0 credit) Northwestern University

Instructor:

[Nelson Switzer](#), Climate Innovation Capital

Potential Guest Lecturers:

[Will Sarni](#), CEO, Water Foundry

[Chris Coulter](#), CEO, Globescan

[Yash Lohia](#), CSO, Indorama Ventures Ltd.

[Michael Jantzi](#), CEO, Sustainalytics

[Libby Bernick](#), CEO, Impact Cubed

[Dan Zilnik](#), President, Afara

[Laura Zizzo](#), CEO, Manifest Climate

[Julie Tartt](#), Senior Operations Manager, Brightspot Climate

Office Hours: By appointment

Classroom: Annenberg Hall, Room G21

Class Timing: Winter Quarter, MSES Core Course (10 weeks); Jan 3 – March 11, 2022; Wednesday 12-3 pm; classes in person

Course Synopsis: This course aims to provide a broad overview of the widely used quantitative tools in sustainability. Using a discussion, case-based and problem-set centered focus, this course will delve into issues surrounding greenhouse gas quantification and the ways that organizations build sustainability reports and plans. Students will learn about core quantitative methods for measuring sustainability performance while also touching on protocol and policy frameworks that enable the application and verification of these measurements. They will build their ability to measure and quantify impact of an individual organization. The course will ensure that students can both read and be involved in writing a measurable, robust sustainability plan.

Course Goals:

- **Overview of Common Quantitative Tools:** The course will introduce key metrics associated with quantifying environmental impact & sustainability including but not limited to Economic, Environment and Social measures. Students will become familiar with the most widely used of the hundreds of (voluntary) sustainability standards in the market today.
- **Developing Quantitative Capabilities:** Students will learn and apply quantitative concepts to real-world situations. Use of cases and problem sets will offer students a chance to exercise the theories using real data.
- **Understanding GHG Reporting Protocols and Processes:** While there are many measures to consider, greenhouse gases (GHG) will be the primary area of focus in this course. By looking at frameworks from the EPA, IPCC and the GHG Protocol, students will learn the varied protocols

that govern GHG reporting. By touching on firms such as the CDP and GRI, students will also learn about the growing market for disclosures and its importance.

- **Applying Quantitative Tools:** In addition to focus on what to measure and how to measure it, students will be engaged in conversations about how to engage stakeholders who are at various levels of their journey in sustainability measurement.
- **Producing Real-World Sustainability Reports:** By the end of the course, students should be able to critically read a sustainability plan and be positioned by the end to be the primary (but not solitary) author of a sustainability report for a small company, city, or equivalent entity.

Component	Details	Due
Effort and Attendance (10%)	Effort will be graded through attendance, class participation and readings for the day. This ensures that the readings are done and that students are engaged in work outside the classroom.	-
Non-Financial Reporting Case (20%)	Students will be provided a case study and will be asked to submit a 2-3 page write-up. Detailed instructions and specific requirements for the case study will be provided in class.	Week #6
Quiz (10%)	Quiz based on class content. Questions may cover frameworks, standards, metrics and calculation methodologies. Questions may come in the form of definitions, analyses, calculations and multiple-choice responses. Questions may be sourced from the required readings.	Week #7
Problem Sets (20%)	Students will be provided with a series of greenhouse gas (GHG) emission scenarios to calculate in class.	Week #2, 3, 5 and 6
Final Project (40%)	<p>The Final Project is an integral component of the learning process in this course. The overarching objective is to gain first-hand experience on how to understand and assess the quality of sustainability reports in a specific industrial context and gain detailed knowledge about sustainability reporting frameworks.</p> <p>Students will work in groups of four (4) or five (5) and will choose one industry (such as mining, oil and gas, chemicals, pulp and paper, transportation, steel and metals, utilities, consumer packaged goods (CPG), etc.) and examine current sustainability reporting practices in this industry.</p> <p>The Final Project is broken down in 3 segments:</p> <ol style="list-style-type: none"> 1. Research Proposal 2. Final Project Report 3. Presentation <p>Research Proposal (10%)</p>	<p>Proposals: Week #5</p> <p>Final Project Report: Week #9</p> <p>Presentation: Week #9 or #10</p>



The groups should obtain non-financial (e.g. Sustainability, CSR and ESG) reports of a sample of firms in the industry (10 firms are a recommended sample size for this project) and conduct an in-depth analysis of the non-financial reports. For industrial sectors with many firms, it is acceptable to use the ten largest companies as the study sample. Groups will also review relevant corporate disclosures, standards, business publications and research studies to support their analysis and methodology.

Group research proposals are due before beginning of class in Week #5 and must be submitted through the course portal. The group research proposal should not exceed four (4) pages, including the cover page, and it should include the following elements (not in the exact order):

1. A clear statement of the research objectives
2. Choice of the industry and why
3. Discussion of the environmental and social impacts of the chosen industry
4. Review of related publications and relevant research studies
5. Discussion of research methodology (i.e. how to analyze the information disclosed in the sustainability reports in terms of quantity, quality, reliability, and usefulness to different stakeholders)
6. A list of sample firms with available sustainability reports
7. A list of relevant publications and research studies (to support your research methodology)

Choice of Industry: Guidance

The idea of this research project is to identify a group of companies with similar business operations. Companies using similar technologies and natural resources to produce similar products will likely have similar environmental and social impacts. That way, you can compare environmental disclosures or performance using the same performance measures or benchmarks. It is difficult (and often impossible) to compare the environmental performance of companies in different industrial sectors with different operating conditions, simply because their environmental and social impacts may differ dramatically.

1. Choose an industry that is well defined according to the following weblink about Standard Industry Classification: https://en.wikipedia.org/wiki/Standard_Industrial_Classification#:~:text=The%20Standard%2



[0Industrial%20Classification%20\(SIC,United%20Kingdom%27s%20Companies%20House;](#)

2. Make sure you have a sufficient number of companies in the industry that are public companies, i.e. listed on a stock exchange, so that you can access financial and non-financial (e.g. Annual, Sustainability, CSR and ESG) reports. A sample of 10 companies would be a good start.
3. Choose an industry that you are familiar with in terms of their business operations and their environmental and social impacts.
4. Ensure the companies you choose are big enough to publish a separate non-financial report. Smaller firms may not do so due to resource constraints.

Please submit your group and choice of industry before the third class is Week #2 through the course portal. Ideally, each group will examine a different industry for this research project.

Final Research Report (15%)

Final research reports are due before class of Week #9 and they should be submitted through the course portal. The final research report should not exceed 15 pages excluding appendices; using 1.5 line-spacing, 11 font size, 2 cm margins on all four sides. The final reports should be prepared professionally with a cover page, an executive summary, a table of contents, subtitles, conclusions, and a list of references.

The final research reports should discuss the following:

1. The applicable and relevant non-financial reporting standards or frameworks for the industry
2. Degree of compliance with the existing non-financial reporting frameworks by the sample companies
3. Key stakeholder groups (intended readers of the non-financial reports) and the degree and mechanisms of stakeholder engagement as disclosed in the non-financial reports
4. Usefulness of the information disclosed in the non-financial reports with respect to assessing a firm's progress in sustainability management over time and relative to its industry peers
5. Usefulness of the non-financial reports to investors
6. Mechanisms employed by the firms to enhance the credibility and reliability in their non-financial reports and the effectiveness of these mechanisms



	<p>7. A critical assessment of the non-financial reporting metrics in the industry and recommendations for managers, investors, sustainability reporting standard setters, non-profit stakeholders (i.e. the key take-aways from the research study)</p> <p>8. A critical assessment of the greenhouse gas inventory and calculation methodology.</p> <p>Research Project Presentation (15%)</p> <p>Each group will prepare a presentation based on the final group research report and deliver the presentation during Week #9 or Week #10. The presentation should last no more than 20 minutes and the order of the presentation by different groups will be determined at the beginning of the class randomly. An evaluation rubric for the group presentation will be provided later. Students will evaluate one another’s presentations, which will constitute half of the research project presentation grading.</p>	
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Grading/Assessment: All questions and problems regarding grades must be presented in writing within one week after the test, homework, or project has been returned. The grading scale is fixed, please do not wait until the end of the quarter if you are concerned about the direction of your grade. Grades will be assigned based on all the work you have completed during the semester using the following scale:

A	93.333 to 100	C	73.333 to 76.666
A-	90.000 to 93.333	C-	70.000 to 73.333
B+	86.666 to 90.000	D+	66.666 to 70.000
B	83.333 to 86.666	D	63.333 to 66.666
B-	80.000 to 83.333	D-	60.000 to 63.333
C+	76.666 to 80.000	F	< 60.000

Unless an exception has been granted by the professor in advance, 10% will be deducted from late homework assignments turned in within 24 hours of the deadline. 50% will be deducted from late homework assignments that are more than 24 hours but less than 7 days late. No credit will be given for homework turned in more than 7 days after the deadline.

CLASS OUTLINE

Weekly Topic	Description
1: Introduction to non-financial (ESG) Reporting	<ul style="list-style-type: none"> ● Lecture 1: <ul style="list-style-type: none"> ○ Introduction and course logistics ○ Fundamentals of ESG & Sustainable Development



<p>January 5, 2022</p>	<ul style="list-style-type: none"> ○ Non-Financial (ESG, Sustainability, CSR) reporting and surveys (CDP, Sustainalytics, DJSI, FTSE4Good) ○ The Characteristics of a Non-Financial Reporting team member ● Metric & Tool Lecture: <ul style="list-style-type: none"> ○ Carbon Reduction Potential ○ Carbon KPI Framework ● Assign: Final Project ● Readings: <ul style="list-style-type: none"> ○ Climate Innovation Capital, Carbon KPI Framework ○ York, J., Dembek, C., Potter, B., & Gee, W. 2017. Sustainability reporting to improve organizational performance. ● Additional Resources: <ul style="list-style-type: none"> ○ Clean Energy Ventures SERC: https://cevg.com/members/impact/calculate?_ga=2.134618803.393869770.1638887139-1889567986.1638887139 ● Guest Speaker: Libby Bernick, CEO, Impact Cubed
<p>2: Non-Financial Reporting Standards</p> <p>January 12, 2022</p>	<ul style="list-style-type: none"> ● Lecture 2: <ul style="list-style-type: none"> ○ Disclosure Standards, their importance and relevance ○ Overview of common Standards, such as GRI and SASB ○ Industry-specific Standards ● Metric & Tool Lecture: <ul style="list-style-type: none"> ○ % Recyclable ○ Material Quality Review ● GHG Problem Set #1 (in class): <ul style="list-style-type: none"> ○ Direct Emission from Stationary Combustion ● DUE (by 11 am): Final Project Group and Industry Selection ● Readings: <ul style="list-style-type: none"> ○ Sustainability Accounting Standards Board (SASB) Implementation Primer ○ Global Reporting Initiative, GRI Standards; GRI 1: Foundation 2021 ○ ICMM, Mining Principles, 2020 ○ Delivering on our Commitments, Responsible Care Report, 2020 ● Additional Resources: <ul style="list-style-type: none"> ○ Fulsome Set of GRI Standards ● Guest Speaker: Dan Zilnik, President, Afara
<p>3: ESG Metrics & Tools</p> <p>January 19, 2022</p>	<ul style="list-style-type: none"> ● Lecture 3: <ul style="list-style-type: none"> ○ The ESG framework ○ ESG Metrics and how they are used ○ Qualifying the quality of a metric ○ The metrics of different Standards, such as from the SDGs, GRI and SASB



	<ul style="list-style-type: none"> ○ Metrics for rating and ranking; the “Dilution Effect” ● Metric & Tool Lecture: <ul style="list-style-type: none"> ○ Water Quality & Quantity ○ The ARR Method ● GHG Problem Set #2 (In Class): <ul style="list-style-type: none"> ○ Direct Emissions from Mobile Combustion ● Readings: <ul style="list-style-type: none"> ○ Linking the SDGs and GRI Standard, March 2020 ○ SDG Indicator Inventory ○ The Coca Cola Company, CDP Water Report, 2020 ○ Coke Claims to Give Back as Much Water as It Uses, VERGE, Christine MacDonald, May 2018 ● Additional Resources: <ul style="list-style-type: none"> ○ Quantifying Replenish Benefits in Community Water Benefit Projects, LimnoTech, April 2016 ● Guest Speaker: Michael Jantzi, CEO, Sustainalytics
<p>4: GHG Accounting, Target Setting and Net Zero</p> <p>January 26, 2022</p>	<ul style="list-style-type: none"> ● Lecture 4: <ul style="list-style-type: none"> ○ Scope 1, 2 & 3 emissions ○ Global Warming Potential, CO₂e, carbon intensity vs. absolute reductions and related concepts ○ Standards & Protocols including GHG Protocol, ISO14064, SBTi, Climate Neutral Standard (including Brand Emissions Estimator (BEE)) ● Metric & Tool Lecture: <ul style="list-style-type: none"> ○ GHG ○ GHG Protocol Calculator ● In-class Case Study Discussion: <ul style="list-style-type: none"> ○ Shell Net Carbon Footprint Model ● Assign: Case Study #1, Non-Financial Disclosure Report Comparative Analysis ● Readings: <ul style="list-style-type: none"> ○ The SBTi Net Zero Corporate Manual, Version 1.1, July 2021. ○ GHG Protocol GHG Emissions Calculation Tool (excel) ○ The Climate Neutral Certified Standards, For Brands Certifying in 2021 ● Additional Resources: <ul style="list-style-type: none"> ○ The Net Carbon Footprint Model: Methodology (Public), Shell Global Solutions US Inc., November 2020. ○ Carbon Accounting Manual for the calculation of HP’s fiscal year 2020 greenhouse gas emissions, HP Development Company L.P., 2020.



	<ul style="list-style-type: none"> ○ BHP, Scope 1, 2 and 3 Emissions Calculation Methodology 2020, September 2020. ● Guest Speaker: Julie Tartt, Senior Operations Manager, Brightspot Climate
<p>5: Stakeholders</p> <p>February 2, 2022</p>	<ul style="list-style-type: none"> ● Lecture 5: <ul style="list-style-type: none"> ○ Defining a stakeholder and reviewing common types including investors, lenders, government, NGO's, media, consumers, etc. ○ Prioritizing stakeholders ○ Internal stakeholders of a corporate reporter including the disclosure team, operations, travel, real estate, logistics, strategy, etc. ○ Community Benefit Agreement ● Metric & Tool: <ul style="list-style-type: none"> ○ Stakeholder Engagement Implementation Platform ● GHG Problem Set #3 (in class): <ul style="list-style-type: none"> ○ Indirect Emissions from Electricity Use ● DUE: Final Report; Proposal ● Readings: <ul style="list-style-type: none"> ○ Guide to Advancing Opportunities for Community Benefits through Energy Project Development, US Department of Energy, Office of Minority Business and Economic Development August 1, 2017. ○ Case Study: Southeast False Creek Community Benefits Agreement ● Additional Resources: <ul style="list-style-type: none"> ○ IBA Community Toolkit, Negotiation and Implementation of Impact Benefit Agreements, Ginger Gibson & Ciaran O'Faircheallaigh, Summer 2015 Edition ● Guest Speaker: Yash Lohia, CSO, Indorama Ventures Ltd.
<p>6: Selecting a Non-Financial Reporting Standard</p> <p>February 9, 2022</p>	<ul style="list-style-type: none"> ● Lecture 6: <ul style="list-style-type: none"> ○ Case Study: Danone; Adopting Integrated Reporting or Not. Key concepts include Standard selection and the factors that influence decision making ○ Card Game: communication ● GHG Problem Set #4 (in class): <ul style="list-style-type: none"> ○ Indirect Fugitive Emissions ● DUE: Case Study #1 ● Readings: <ul style="list-style-type: none"> ○ Danone: Adopting Integrated Reporting of Not (A), Ivey, Version 2018-11-26. <p>Guest Speaker: Chris Coulter, CEO, Globescan</p>



<p>7: Materiality & Prioritization</p> <p>February 16, 2022</p>	<ul style="list-style-type: none"> ● Lecture 7: <ul style="list-style-type: none"> ○ Materiality as a concept ○ How material issues are identified ○ The Materiality Plot ○ Materiality & stakeholder engagement process(es) ● QUIZ ● Readings: <ul style="list-style-type: none"> ○ Toward Common Metrics and Consistent Reporting of Sustainable Value Creation, World Economic Forum, January 2020 ○ Value Reporting Framework, Materiality Finder: https://www.sasb.org/standards/materiality-finder/find/ <p>Guest Speaker: Will Sarni, CEO, The Water Foundry</p>
<p>8: TCFD Framework</p> <p>February 23, 2022</p>	<ul style="list-style-type: none"> ● Lecture 8: <ul style="list-style-type: none"> ○ TCFD and it's segments and recommendations ○ The value of and need for TCFD ○ Scenario analysis ○ Case Study Discussion: Bank of America TCFD Report ● Readings: <ul style="list-style-type: none"> ○ Task Force on Climate-related Financial Disclosure Overview, March 2021 ○ Case Study: Responsible Growth and a Low-Carbon Economy, Bank of America's Task Force on Climate-related Financial Disclosure Report, 2020 <p>Guest Speaker: Laura Zizzo, CEO, Manifest</p>
<p>9: Final Research Report: Presentations</p> <p>March 2, 2022</p>	<ul style="list-style-type: none"> ● Group presentations: <ul style="list-style-type: none"> ○ Groups #1-5 (30 mins each: 15-20 mins presentation; 5-10 min class Q&A) ● DUE (by 11 am): Final Project; Report
<p>10: Final Research Report: Presentations</p> <p>March 9, 2022</p>	<ul style="list-style-type: none"> ● Group presentations: <ul style="list-style-type: none"> ○ Groups #6-9 (30 mins each: 15-20 mins presentation; 5-10 min class Q&A) ● Class Wrap-up

Students, faculty, and staff must comply with University expectations regarding appropriate classroom behavior, including those outlined below and in the [COVID-19 Code of Conduct](#). With respect to classroom procedures, this includes:

- Policies regarding masking and social distancing evolve as the public health situation changes. Students are responsible for understanding and complying with current masking, testing, Symptom Tracking, and social distancing requirements.
- In some classes, masking and/or social distancing may be required as a result of an Americans with Disabilities Act (ADA) accommodation for the instructor or a student in the class even when not generally required on campus. In such cases, the instructor will notify the class.
- No food is allowed inside classrooms. Drinks are permitted, but please keep your face covering on and use a straw.
- Faculty may assign seats in some classes to help facilitate contact tracing in the event that a student tests positive for COVID-19. Students must sit in their assigned seats.

If a student fails to comply with the [COVID-19 Code of Conduct](#) or other University expectations related to COVID-19, the instructor may ask the student to leave the class. The instructor is asked to report the incident to the Office of Community Standards for additional follow-up.

Class Recording

This class or portions of this class will be recorded by the instructor for educational purpose and available to the class during the quarter. Your instructor will communicate how you can access the recordings. Portions of the course that contain images, questions or commentary/discussion by students will be edited out of any recordings that are saved beyond the current term.

Unauthorized student recording of classroom or other academic activities (including advising sessions or office hours) is prohibited. Unauthorized recording is unethical and may also be a violation of University policy and state law. Students requesting the use of assistive technology as an accommodation should contact [AccessibleNU](#). Unauthorized use of classroom recordings – including distributing or posting them – is also prohibited. Under the University's [Copyright Policy](#), faculty own the copyright to instructional materials – including those resources created specifically for the purposes of instruction, such as syllabi, lectures and lecture notes, and presentations. Students cannot copy, reproduce, display, or distribute these materials. Students who engage in unauthorized recording, unauthorized use of a recording, or unauthorized distribution of instructional materials will be referred to the appropriate University office for follow-up.

Expectations for Class Participation

Being prepared for class is about more than just showing up, it's also about making sure you've completed the readings, homework, etc. so that you are able to make thoughtful contributions during class. Sitting silently and/or being unprepared can damage your participation grade. When in a virtual

class, we expect students to keep their camera and mute on as much as possible. When in the classroom, we expect students to keep their phones off and put away.

Academic Integrity

Academic integrity is taken very seriously at Northwestern. Students are responsible for reading and understanding Northwestern's Academic Integrity policies. All suspected violations will be reported to the McCormick College of Engineering's Dean's Office. These include cheating, plagiarism, fabrication, unfair advantage, unauthorized collaboration, and aiding and abetting of academic dishonesty. Students found in violation of academic integrity may receive a zero on the assignment or a failing grade for the course and may be suspended or permanently expelled from the University. See [Academic Integrity: A Basic Guide](#) for more information.

The Writing Place

When working on writing assignments for this class, I encourage you to visit the Writing Place, Northwestern's peer writing center. You will work with juniors and seniors who have been trained to provide you feedback and assistance on any type of writing at any stage in the writing process. They will not edit your work. Rather, they will work with you to brainstorm ideas, organize or outline an essay, clarify your argument, document your sources correctly, or refine grammar and style.

Accessibility Statement

Northwestern University is committed to providing the most accessible learning environment as possible for students with disabilities. Should you anticipate or experience disability-related barriers in the academic setting, please contact AccessibleNU to move forward with the university's established accommodation process (e: accessiblenu@northwestern.edu; p: 847-467-5530). If you already have established accommodations with AccessibleNU, please let me know as soon as possible, preferably within the first two weeks of the term, so we can work together to implement your disability accommodations. Disability information, including academic accommodations, is confidential under the Family Educational Rights and Privacy Act.

Illness and Medical Leave of Absence

Review the University's [policy](#) on missing academic work due to illness. Your instructor cannot waive an assignment missed due to illness unless the illness can be verified (e.g., by University Health Services or other licensed health professionals).

Discrimination and Sexual Harassment

Northwestern's Policies on Discrimination, Harassment, and Sexual Harassment apply to all members of the University community, including students, staff, faculty, and third parties. Any student, staff, faculty member, or third party who believes that they have been discriminated against or harassed on the basis of their race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, pregnancy, parental status, marital status, age, disability, citizenship, veteran status, genetic information or any other classification protected by law, should contact the Office of Equity at (847) 467- 6571. Additional information about the University's discrimination and harassment policies, including the

campus resources available to assist individuals with discrimination or harassment concerns, is available online on the [Office of Equity Website](#). Students, staff, and faculty who report harassment, discrimination, or sexual misconduct are also protected under the [University's Policy on Non-Retaliation](#).

Sexual Misconduct and Reporting

Northwestern University is committed to fostering an environment where students are safe and free from sexual misconduct. [Confidential resources](#) are available to those who have experienced sexual misconduct. Faculty and instructors are not confidential resources and are required to report incidents of sexual misconduct, whether discussed in your assignments or in person, to the Office of Equity, which can provide information about resources and options. We encourage students who have experienced sexual misconduct to talk with someone to get support. For more information, including how to request interim protective measures and academic accommodations or file a complaint, see the [Get Help page](#).

Other Resources

Students can find useful resources for safety and security, academic support, and mental and physical health and well-being at the [NUhelp website](#).