

Environmental Sustainability and Value Creation

LGST/OIDD 7620

Fall 2024

Professor: Gary Survis

Teaching Assistants: Michael Shostek and Amy Ochsenreiter

Phone: 973-464-9293 (Gary cell), 570-877-3585 (Michael cell), 412-512-6313 (Amy cell)

E-mail: gsurvis@wharton.upenn.edu, shostekm@sas.upenn.edu, amy.ochsenreiter@gaf.com
(preferred contact method)

Classes: Mondays, 3:30pm to 6:30pm ET, SHDH 215

Professor's Office Hours: Mondays by appointment, phone, or video (Zoom, FaceTime)

Teaching Assistants' Office Hours: Mondays by appointment, phone, or video (Zoom, FaceTime, Google Meet)

Course Objectives

1. Understand **sustainability's levers for value creation** as it relates to corporate strategy, business operations, financial objectives, and social responsibility.
2. Learn how corporations that maintain sustainability as a core strategic tenet are **making a significant impact on the environment**, independent of government regulation, while **driving strong performance**.
3. Gain an appreciation for the **trade-offs** that are being made daily in business around sustainability issues and understand that there is not always a "right answer."
4. Explore meaningful **opportunities** for businesses and entrepreneurs to drive value creation through sustainable strategies and tactics.
5. Focus on **real-world topics through real-world examples** and **current news discussions**, enabling exposure to how business and sustainability issues are **creating opportunities**, while still rapidly evolving.

Course Overview

The TL,DR

Sustainability is no longer a business' side hustle. Businesses in the future will survive or perish depending on their capacity to weave sustainability into their core strategy and drive value creation. Businesses must be prepared for climate change's impacts on their operations and must be fully positioned to drive value creation and innovation in these challenging times.

Business cannot simply react to environmental mandates; they must lead and drive change!

Why should I care?

Today, to effectively work in senior management, an executive has to be knowledgeable not only about their specific business function, but also on how their business will be impacted by environmental supply chain disruptions, requirements around sustainability reporting, ESG (environmental, social, and governance) demands on a business, ability to market sustainable product attributes, managing energy, water, and food needs globally, and sustainable technology to drive new initiatives.

How will it work?

The class will balance the reality that some students come from a background in this space, while for others this will be their first course on sustainability. The time spent in class will be integral to the learning experience. Each class will commence with a discussion of current environmental news and events, with emphasis on topics dealing with sustainable innovations, environmental controversies, and breakthrough business strategies within the sustainability space. This interactive learning environment will leverage multiple tools including simulations, asynchronous learning, in-class exercises, case studies, real-world artifacts, and guest participants.

The Bottom Line

By the end of this course, every student should be well equipped to understand how a business' actions, across a variety of sustainability issues, can either be value creating or value destroying.

Course Plan

Meeting Date	Focus Area
8/26/24	Class Introduction/Sustainability Strategy and Value Creation
9/9/24	Sustainability Reporting and ESG Investing
9/16/24	Sustainability Marketing and Communications
9/23/24	Climate Change: Managing Risk and Opportunity
9/30/24	Climate Change: Scenarios for Reaching 1.5° Celsius
10/7/24	Innovating and Financing the Climate Tech Revolution/Class Wrap-Up

Course Requirements

Class Attendance: We will be leveraging both synchronous and asynchronous learning techniques. An asynchronous **Base Concepts Lecture (BCL)** video recording will be posted on Canvas as part of the preparation prior to the live class. The **Integrated Learning Session (ILS)** will be our live class where time will be dedicated to utilizing your preparation to fuel interactive learning, discussion, and debate through a combination of lecture, interactive tools, case analyses, breakout groups, and reviews of current issues.

Given that the ILS is central to our class, your attendance is required. We are only meeting for 6 sessions, so each class is critical to your learning. These sessions should fuel students' passions around sustainability and make our time together valuable, fun, and productive. N.B., the course will adhere to the MBA program's policy of student use of devices in class. Any violations of [this policy](#) will be reflected in your participation grade.

If you anticipate missing a class, you must inform the professor and teaching assistants via email prior to the respective class. Absences will be excused only for advanced notice of family or personal medical emergencies, illness, and religious holidays. Your attendance is otherwise imperative for our dynamic learning environment. In addition, **all students MUST attend the first class on August 26. Students who do not attend the first class without express permission of the professor and teaching assistants due to extenuating circumstances will not be permitted to take the course.**

An excused student absence may earn their engagement grade by doing the following no later than **11:59pm EST on the Friday** before the start of the next class:

- **Required:** Post answers to **ALL** of the areas of inquiry questions in the respective Canvas discussion for the week
- **Required:** Listen to the BCL in its entirety
- **Required:** Review the lecture slides and listen to the ILS recording in its entirety
- *Optional:* Contribution and discussion through articles posted and thoughtful responses on Canvas as well as other offline participation options

Class Engagement: Engagement is what powers the enjoyment of teaching and presents diverse points of view from classmates. Class time will be enriched by the thoughtful participation of you and your peers. In addition, engagement begins with being present, both physically and mentally. The success of our class time is dependent on a vibrant, participatory group. The weighting on a student’s course grade reflects this importance. Emphasis in engagement grading will be on consistent, meaningful contribution to the class, not on the amount of talk time—it is quality over quantity.

We believe you should have multiple ways to participate in the class. In addition to attending class, you must **choose at least one of the optional choices to receive full participation credit** for that class.

- **Required:** Class attendance at the ILS
- **Required:** Watch the BCL in its entirety prior to class
- **Required:** Collaborative participation during class and group work, including but not limited to the final group project.
- *Option A:* Participate in the ILS class discussions.
- *Option B:* Contribution and discussion through articles posted and thoughtful responses on Canvas.
- *Option C:* Add comments to the weekly areas of inquiry discussion on Canvas.

Learning Resources and Class Preparation: A highly curated listing of essential readings on a topic can be an accelerator of deeper knowledge on a topic. However, every student has their own point of view of what is “essential” and when it crosses the line for being “too much.” **Mindful of this, there are no Deeper Knowledge Readings required for any of our classes, but this does not mean there is not time required to prepare for each class.**

Chronologically, the **recommended preparation for each class is as follows:**

- **Don’t Miss Concepts:** Each ILS will conclude with an overview of important concepts that build upon each other during the course. Hint: Use these to ensure you are covering the essential concepts in the final project.
- **Base Concepts Lecture (BCL):** Each week, a pre-recorded lecture of the key areas to know and understand for the upcoming class will be posted on Canvas. This lecture will be no more than 1 hour at 1X speed. It will refer to readings and concepts that, if you choose, you may elect to explore in the Deeper Knowledge Readings (see below).

- **Original Artifacts:** Real world videos, policies, cases, or letters can form a rich basis for our class discussion. For some classes, there will be an artifact(s) for you to review in preparation for the class. All are housed on Canvas.
- **Deeper Knowledge Readings:** **None of these readings are required** to be prepared for the live class. However, for those students who wish to explore and develop a deeper understanding of a particular topic or point-of-view, these outstanding, curated resources will feed your curiosity.

Value Creation Response (VCR) Papers: During the quarter, each student will be responsible for submitting **two (2) value creation response papers** related to an organization's creation of value through environmental sustainability. *It will be based on a specific article the teaching assistants post on Canvas for each week.* Students will have 6 opportunities to complete this assignment throughout the quarter. **It is strongly encouraged that students choose to complete one VCR during the first half of the course, receive feedback, and complete the additional VCR during the second half of the course.**

Each student will choose which two weeks to submit these papers and each paper will account for **15%, totaling 30% of your final grade.** Each response will answer the following questions and fulfill the following requirements:

- **Leveraging our Value Creation Pentagon, explain across which dimensions this company is either creating value or destroying value.**
- **What should the company do differently, based on concepts from our class, to make the necessary changes to create value?**
- The response will be a maximum of 500 words (a single page) and uploaded as a PDF to Canvas.
- The responses will also adhere to the course policy on generative AI and the University's policy and definition of plagiarism, as outlined later in the syllabus.

VCRs are due twice during the quarter. The response is due for submission on Canvas **by 11:59pm EST on Thursdays.** The system will provide a **30-minute grace period** and then locks out submissions. Examples of well-written, concise, and thought-provoking papers from former students are available on Canvas.

En-ROADS Simulation Write-Up: [En-ROADS](#) is a sophisticated policy simulation that enables you to create a scenario of how you might mitigate the impact of climate change. In advance of this class, you will develop a scenario and justify the reasoning behind your recommendations. Complete details on how to use En-ROADS and the requirements of this submission are available on Canvas.

Final Group Project Company Analysis: The final project of the course will be a group analysis of how a single business has driven value creation through its sustainable business strategy. The analysis should

be comprehensive of the topics we covered during the course. The goal is to integrate the knowledge learned from BCLs, ILSs, deeper knowledge readings, and original artifacts to present a comprehensive picture of a major corporation's sustainability strategies and outcomes. **The paper will be no longer than 15 pages and is due no later than 11:59pm EST on Friday, October 18 (but can be submitted earlier).** Full details of the paper and its requirements will be provided on Canvas **following the September 16 class.**

Assessment

Weighting

Class Engagement/Attendance	25%
Value Creation Responses (2)	30%
En-ROADS Simulation Write-Up	15%
Final Group Project	30%

Grading

A+	97-100
A	93-96
A-	90-92
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
Below these scores...let's talk!	

Final grades for Wharton MBA students will be subject to [Wharton CMGPA requirements](#).

Additional Information

Class Generative AI (GAI) Policy: The use of Generative AI (GAI), e.g., ChatGPT, Google Gemini, Microsoft Bing, Claude and/or any generative text/image generation tools, is encouraged. The capacity to leverage GAI skills effectively will be important for your success in any business role. Why wait to learn? This tool will make everyone better communicators and allow students where English is not their first language to face a level grading field. The professor will provide a tutorial on how to appropriately leverage these tools.

As Uncle Ben wisely remarked in Spider-Man, with great power, comes great responsibility. So too must you understand how to harness the power of GAI to achieve the results you want:

- If you provide minimum-effort prompts, you will receive low-quality results in return. You will need to refine your prompts for optimal outcomes. This will take work.
- Don't trust anything it says. If it gives you a number or fact, assume it is wrong unless you either know the answer or can check with another source. You will be responsible for any errors or omissions provided by the tool. It works best for topics you understand.

- If you submit bland, generic responses to prompts in the class, we will know and grade you accordingly. Referencing class materials, concepts, and discussions will enhance your grade.

GAI is a tool, but one that you need to acknowledge using. **Footnote the prompts used in your writing as follows:** GAI Tool, Date accessed, and Prompt used. For example, *Claude, Sept. 15, 2024, Prompt: Include a section based on the GreenBiz article on upcycling and its power in the circular economy add specifically on the role of TerraCycle in delivering upcycling.*

Also **include a section entitled “Article Sourcing”** where you will list all the GAI tools used in the paper and documents you uploaded to the GAI tool.

This explanation does not count towards the assignment’s word count limit. Failure to follow this approach is in violation of academic honesty policies. **See the VCR example provided as a complete example.** Special thanks to Ethan Mollick and Lilach Mollick for inspiring this policy.

Materials for the Class: Most materials are posted in the files section of Canvas. There are additional Harvard Business Review articles and cases available in Study.net on Canvas.

Citations and Plagiarism: Students must give adequate citations for all sources quoted or used in writing papers. No specific form of citations in footnotes is required, if the source is identified sufficiently for it to be found and checked. [The Purdue Owl Research and Citation Resources](#) is a helpful, recommended tool when writing. Every written submission, including the final paper, must be the student’s own work. **Any incident of plagiarism will be fully prosecuted through the usual channels. The University’s Policy and Definition of Plagiarism may be found [here](#).**

Writing Support: For graduate students seeking writing support, [Learning Specialists at the Weingarten Center](#) can help with project management, academic writing strategies, and more. In addition, there are several opportunities for graduate students to connect with writing communities and support through the [Graduate Center](#). We strongly advocate for students to utilize these resources. Students can also schedule an appointment with the teaching assistants to discuss their drafts. So too, students should leverage peers and GAI for grammar/spelling feedback, while adhering to the University’s Policy and Definition of Plagiarism & the Course’s Generative AI Policy.

Lastly, the Graduate School of Education (GSE) is launching a Writing Commons Initiative to provide writing support for graduate students. Contact writingcommons@gse.upenn.edu to learn more about Writing Commons resources, programs, and events.

Mental Health and Wellness: If you are feeling overwhelmed or facing unprecedented challenges, we encourage you to reach out to us. There are also professional resources for support at Penn. These include all of the offices under [Wellness at Penn](#).

Student Health and Counseling offers 24/7 support for students. To schedule a medical appointment, visit the Wellness Portal or call 215-746-3535. To schedule a counseling appointment, call 215-898-7021. To speak to a clinician after hours, press 1.

Curriculum and Assignments

N.B., **SN** denotes part of Study.net case pack

8/26 - Focus Concept: Sustainability Strategy and Value Creation

Modern business has been challenged to do things differently. The issues of environmental sustainability and the threats of climate change are creating new opportunities for business to drive value. Yet, many organizations have failed to develop a coherent strategy around these issues and ultimately have delivered less value. Delivering value for stakeholders through sustainability is complicated and multi-dimensional. Only organizations that determine a strategy combined with tangible tactics will deliver on the promise.

AREAS OF INQUIRY

- What is the role of goals in driving meaningful sustainability initiative results?
- How are organizations driving value from their sustainability initiatives?
- How do different frameworks for competitive sustainability strategies compare?
- Can competitive businesses collaborate on sustainable initiatives?
- How does leadership deliver on sustainability goals?
- What is the role of purpose in value creation from sustainability?

ORIGINAL ARTIFACTS FOR CLASS DISCUSSION:

- [ESG Poster Child Unilever Waters Down Climate Pledges](#), Bloomberg Businessweek, Apr. 19, 2024 (10 mins.)
- [Unilever CEO](#), Feb. 9, 2024 (4 mins.)

OPTIONAL DEEPER KNOWLEDGE READINGS

Sustainability & Value Creation

[How Companies Capture the Value of Sustainability](#), McKinsey, Apr. 2021

[ESG momentum: Seven reported traits that set organizations apart](#), McKinsey, Mar. 2023

[How to Make ESG Real](#), McKinsey Quarterly, Lucy Perez, Dame Vivian Hunt, Hamid Samandari, Robin Nuttall, and Donatella Bellone, Aug. 2022

Strategic Frameworks for Capturing Value

[The Business of Sustainability](#), Bonini and Gorner, McKinsey, 2011

[Creating Shared Value](#), Porter and Kramer, *Harvard Business Review*, Jan. 2011 **SN**

[Green Innovation Games: Value-Creation Strategies for Corporate Sustainability](#), Lampikoski, Westerlund, et al., *California Management Review*, Fall 2014 **SN**

Sustainability Leadership

Leadership for the Decade of Action, UN Global Compact/Russell Reynolds, June 2020
Reimagining the Agenda: Unlocking the Global Pathways to Resilience, Growth, and Sustainability for 2030, The 12th United Nations Global Compact-Accenture CEO Study, 2022

The Role of Sustainability Goals

Setting Science-Based Targets to Combat Climate Change, Mendiluce, *Harvard Business Review*, Feb. 2, 2022 **SN**
Inside the little-known group setting corporate climate agenda, Stolle, *MIT Technology Review*, May 16, 2023 **SN**
More Companies Decide Silence is Golden When Going Green (Green Hushing), *WSJ*, Alice Uribe, Jan. 16, 2024

Creating Value Through Collaboration

The Collaboration Imperative, Nidumolu, Ellison, Whalen, & Billman, *Harvard Business Review*, Apr. 2014 **SN**

Employee Engagement and Sustainability Value Creation

Engaging Employees to Create a Sustainable Business, Paul Polman & CB Bhattacharya, *Stanford Social Innovation Review*, Fall 2016 **SN**

Purpose and Value Creation

Purpose: Shifting from Why to How, *McKinsey Quarterly*, Q2 2020, pp. 116-127
How purpose delivers value in every function and for the enterprise, Deloitte, 2022

Sustainability and Financial Performance

The Triple Play: Growth, profit, and sustainability, McKinsey, Doherty, Kampel, Koivuniemi, Perez, and Rehm, Aug. 2023

9/9 - Focus Concept: Sustainability Reporting and ESG Investing

Every organization has an environmental footprint. The ability of a business to perform a baseline analysis of its impact both “upstream” and “downstream” is critical in developing an environmental strategy. A key strategy that business is leveraging to create value and reduce its footprint is circular economy tactics. The ability to measure and deliver on the reduction of a business's environmental footprint is core to driving value.

As well, business lives by numbers and needs to know what their environmental footprint is across multiple dimensions. From basic tracking metrics to sophisticated systems to measure value creation and performance, no successful sustainability program can succeed without measurement and goals. The more recent demands of investors have pushed ESG reporting and the value of quantifiable results to the forefront. Standards are emerging but vary quite significantly across the world.

Lastly, sustainable investment in recent years has become a lightning rod for politics. There are compelling arguments on both sides that are shaping ESG and impacting business value.

AREAS OF INQUIRY

- What is the circular economy and what actions is business taking to close the loop?
- What is the impact of materiality versus double materiality on metrics and reporting?
- What are the current standards for reporting?
- What is the impact of new requirements from the SEC, ISSB, and California?
- What is responsible investing? What is ESG investing?
- How are ESG investments rated? How have these investments performed?
- Why has ESG become a lightning rod of controversy?
- Is ESG investing creating value or destroying value?

ORIGINAL ARTIFACTS:

- [ESG and Alpha: Sales or Substance](#), Institutional Investor, Feb. 25, 2022 (12-15 mins.)
- [ESG in the Cross Hairs: Don't Give Up on Economics for the Sake of Ideology](#), Witold Henisz, LinkedIn, July 21, 2022 (10-12 mins.)
- A Chat With Larry Fink (ChatGPT Larry) – Discuss Question with Class GPT Provided (15 mins.)

OPTIONAL DEEPER KNOWLEDGE READINGS

Environmental Footprint and Circular Economy

[Towards the Circular Economy: Business Rationale for an Accelerated Transition](#), Ellen MacArthur Foundation, 2015

[The Circular Business Model](#), Atasu, Dumas, and Van Wassenhove, *Harvard Business Review*, July-Aug. 2021 **SN**

Materiality and Reporting Standards

[Understanding the Global Reporting Standards](#), IFC Beyond the Balance Sheet
[Demystifying the Double Materiality Debate](#), Paia Consulting, June 2023
[Sustainability Materiality Matrices Explained](#), NYU Stern, May 2019

Responsible Investing and ESG Ratings

[The Responsible Investing Landscape: From SRI through ESG to IMPACT](#), IESE Business School, Ferarro & Pathak, Mar. 2021 **SN**
[The Secret Life of ESG Ratings](#), GreenBiz, Joel Makower, May 9, 2022
[How ESG ratings are built](#), GreenBiz, Joel Makower, May 11, 2022
[Are ESG ratings really necessary?](#), GreenBiz, Joel Makower, May 16, 2022
[It's Time to Change How ESG Is Measured](#), *Harvard Business Review*, Cohen, Guren, & Nguyen, July 2024 **SN**
[Making ESG Real: A Returns to Values Driven Investing](#), NYU Stern, Goldhaber, Nov. 2023

Sustainability/ESG and Financial Performance

[Do Corporate Sustainability and Sustainable Finance Generate Better Financial Performance? A Review and Meta-analysis](#), Atz, Holt, Liu, and Bruno, SSRN, Revised Mar. 2022
[Yes, Investing in ESG Pays Off](#), *HBR*, Polman & Winston, Apr. 2022 **SN**
[An Inconvenient Truth about ESG Investing](#), *HBR*, Bhagat, Mar. 2022 **SN**
[ESG Investing: Steady Growth Amidst Adversity](#), Institute for Energy Economics and Financial Analysis, Iyer, June 2024

9/16 - Focus Concept: Sustainability Marketing and Communications

Business is being challenged to determine how best to communicate the ways that sustainability is creating value for the enterprise. Yet the standards of both marketing and communicating to stakeholders is evolving rapidly. If business isn't careful, it can easily end up destroying enterprise value despite best efforts to communicate sustainability product benefits, goals, and progress through various forms of X-washing.

Today, the concept of ESG, "woke" investing, and many social issues challenge a businesses' capacity to know what to communicate to the market, its employees, and shareholders that balances the need to manage value destroying risk to the business against what it believes is right for that business and its stakeholders.

AREAS OF INQUIRY

- How does sustainability marketing destroy and create value?
- Will consumers actually buy sustainable products?
- What is greenwashing? purpose washing? ESG washing?
- What are "allowable" sustainability claims?
- How is sustainability and ESG marketing being regulated?
- What are the particular challenges of marketing and climate change?
- How do companies navigate social issues in their communications?

ORIGINAL ARTIFACTS

- The Case of Tide Cold Water: Will we ever change? (Video)
- The Case of Whole Foods: No longer "Whole Paycheck" (Video)
- Point-Counterpoint Prep
 - [Behind the Backlash Against Bud Light](#)

OPTIONAL DEEPER KNOWLEDGE READINGS

Consumers and Sustainability

[Consumers Care about Sustainability and Back it up with their Wallets](#), McKinsey, Feb. 2023

Sustainability and Products

[Product Sustainability: Back to the Drawing Board](#), McKinsey, Feb. 2022
[6 Strategies for Designing Sustainable Products](#), BCG, Mar. 27, 2023

Greenwashing

[Environmental Claims: Summary of the Green Guides](#), Federal Trade Commission, Oct. 2012.

[The Future of Green Marketing: Anticipated Changes to the FTC's Green Guides](#), Latham & Watkins, June 2023

Sustainable Communications

[When it Comes to Creating Shareholder Value from Climate & Sustainability Commitments, there are No Shortcuts](#), BCG, June 23, 2022

Purpose Marketing

[What is the Purpose of 'Purpose'?](#) Joel Makower, GreenBiz, Aug. 8, 2022

ESG and Social Washing

[Social, Green, Blue, Pink Washing](#), ESG Analytics, Mar. 29, 2022

[Global Greenwashing Regulation: How the World is Cracking Down on Misleading Sustainability Claims](#), Morningstar/Sustainalytics, Nov. 14, 2023

9/23 - Focus Concept: Climate Change: Managing Risk and Opportunity

We have reached the tipping point of impact from the global change to our climate. Business is acutely aware of the risk to its operations and the need for adaptation. It has a unique role to create resilient companies in the face of dramatic climate changes, but also mitigate further climate damage. It has never been clearer that business must take a leadership role in collaborating with industry and world bodies to manage this change. Ultimately, climate change will present many opportunities for business to drive value creation.

Against this backdrop, the global middle class will grow by 2 billion people in the next 20 years. Business must manage resources around the nexus of food, water, and energy to ensure that it will continue to drive value creation against the climate crisis. The nexus of these three critical resources will create incredible challenges because of their interconnectivity as well as, opportunities for businesses that innovate. Overall, solutions will need to accommodate systems thinking instead of siloed solutions to drive value creation.

AREAS OF INQUIRY

- How has and will climate change impact business?
- What are the risks to businesses of not mitigating and adapting to climate change?
- What is a resilient business?
- How do we get to net zero?
- What is the role of offsets?
- How is value being created and destroyed in the oil and gas industry?
- How will business's approaches to food, water, and energy alter the path of climate change?
- What opportunities does climate change present for innovation?

ORIGINAL ARTIFACTS

- BP vs. Exxon Net Zero Comparison
- [This Week Tonight with John Oliver- Carbon Offsets](#)
- [Case: _ExxonMobil: Is Chasing Net Zero Futile](#), by Tan, Bhattacharya, Pan, and Kusnadi: Singapore Management University. **SN**

OPTIONAL DEEPER KNOWLEDGE READINGS

Oil & Gas and Climate Change

[The energy transition is happening: What role can the oil and gas industry play?](#)

McKinsey, Michah Smith, July 12, 2024

[Denial, Disinformation, and Doublespeak: Big Oil's Evolving Effort to Avoid Accountability for Climate Change](#), House Committee on Oversight and Accountability-Democrats and Senate Committee on the Budget, Apr. 2024.

Energy

[Global Energy Outlook 2024: Peaks or Plateaus](#), Resources for the Future, Daniel Raimi, Yuqi Zhu, Richard G. Newell, and Brian C. Preste, Apr. 2024

[New Energy Outlook 2024](#), Bloomberg NEF, May 21, 2024

Water

[Water: A Human and Business Priority](#), Hundertmark, Lueck, and Packer, *McKinsey Quarterly*, Q2 2020, pp. 46-53

Food

[The Agricultural Transition: Building a Sustainable Future](#), McKinsey, June 27, 2023

[Voice of the US Farmer: 2023-24](#), McKinsey, Apr. 2024

Nexus Thinking

[The nexus approach to water–energy–food security: an option for adaptation to climate change](#), Rasul & Sharma, *Climate Policy*, Volume 16, 2016

Climate Change Adaptation and Resilience

[From Risk to Reward: The Business Imperative to Finance Adaptation and Resilience](#), BCG, USAID, and Global Resilience Partnership, December 2023

Climate Change Risk

[Here's how climate change will impact businesses everywhere – and what can be done](#),

Zurich Insurance, Amar Rahman, May 2024

Carbon Offsets

[Laying down the law in the Wild West of the VCM](#), CTVC, May 2024

[What Every Leader Needs to Know about Carbon Credits](#), *HBR*, Walsh and Toffel, Dec. 15, 2023 **SN**

9/30 - Focus Concept: Climate Change: Scenarios for Reaching 1.5° Celsius

The Intergovernmental Panel on Climate Change (IPCC) determined in 2018 that the world needs to slow its warming to 1.5° Celsius above pre-industrial levels to avoid catastrophic consequences to our planet from climate change. The challenges facing the world, and business, are immense to achieve this level of greenhouse gas emissions. It is critical for every leader to understand how the different levers that impact climate change interact and appreciate the tradeoffs that may impact value creation that are required to drive true impact.

Scenario planning is a time-tested approach for organizations to contemplate the risk to their enterprise from inherently uncertain events and develop potential strategies to mitigate the impact. Leveraging this approach, combined with a simulation of the of how different levers impact the path to 1.5 degrees, will enable us to study different scenarios and the challenges to avoid climate disaster.

AREAS OF INQUIRY

- How does scenario planning help businesses manage risk?
- How is business valuing carbon, and should a carbon tax be part of the solution?
- Why is 1.5° Celsius the goal?
- What are the levers that have the largest impact to get us to the 1.5-degree goal?
- What opportunities to drive value creation does climate change present to business?
- What is the role of climate change litigation, and how does it create or destroy value?

ORIGINAL ARTIFACTS

- [En-ROADS Guided Assignment](#) for Interactive Learning Session
- En-ROADS control panel summary

PREPARE AND SUBMIT ASSIGNMENT FOR CLASS DISCUSSION: En-ROADS Climate Simulation Scenario

OPTIONAL DEEPER KNOWLEDGE READINGS

Climate Change Scenario Planning

[Climate Path: What a 1.5 degree path would take](#), *McKinsey Quarterly*, Q2 2020, 28-47

[Interactive: The Pathways to Meeting the Paris Agreement's 1.5C Limit](#), Carbon Brief, Dec. 2023

[Use GenAI to Improve Scenario Planning](#), *HBR*, Tojin T. Eapen, Jake Sotiriadis, Peter Guinto, and Daniel J. Finkenstadt, Dec. 2023 **SN**

Carbon Pricing and Taxes

[The Baker Shultz Carbon Dividend Plan: Bipartisan Climate Roadmap](#), Climate Leadership Council, Apr. 2020

[Can a Universal Carbon Price be Fair for Everyone](#), EY, Dec. 2023

[New Opportunities for Capturing Value from CBAM Regulation](#), McKinsey, June 2024

Carbon Capture Approaches

[Can Carbon Capture Live up to the Hype?](#) *New York Times*, Dec. 6, 2023

[It is Getting Cheaper to Filter Carbon Dioxide from the Air](#), The Verge, June 4, 2024

Climate Change Litigation

[Global Trends in Climate Change Litigation: 2024 Snapshot](#), Joana Setzer and Catherine Higham, The London School of Economics and Political Science, Grantham Research Institute on Climate Change and the Environment, June 27, 2024

[Why Climate Litigators May Be Coming For Your Company](#), Joel Makower, GreenBiz, June 20, 2022

10/7 - Focus Concept: Innovating and Financing the Climate Tech Revolution

There are many who believe that our most pressing sustainability challenges will not be solved by existing approaches, but by major, discontinuous advances that leverage technology. Data, AI, ML, and blockchain are just some of the tools that will help us deliver a more sustainable future. No doubt that advances in technology will not only transform our lives in the future, but also, maybe, help preserve them as well.

Climate change will impact all these areas and demand new innovations to begin driving toward our required net-zero world. There is a large spectrum of areas of investment opportunity that has the potential drive a massive amount of value creation for business.

Today, there is an incredible amount of excitement around money that is poised to be invested in climate tech from both the government and private sectors. The Inflation Reduction Act (IRA) has added billions. Yet, we have seen this story before, and it did not end well! So, have we learned from the lessons of the past? What is different this time?

AREAS OF INQUIRY

- What was cleantech 1.0? Why did it fail?
- Why has cleantech become climate tech?
- Why is climate tech attracting investment today?
- What technologies can help battle climate change?
- What is the current venture environment for climate tech businesses?
- What are the opportunities to invest in the energy transition?
- What are the different options for funding climate tech businesses?

Guest Participant: TBA

OPTIONAL DEEPER KNOWLEDGE READINGS

Inflation Reduction Act

[Here's Where Biden's Climate Law Is Working, and Where It's Falling Short](#), *New York Times*, Brad Plumer, Feb. 21, 2024

[The Inflation Reduction Act: Here's what's in it](#), McKinsey, Oct. 24, 2022

Technology and Sustainability

[Unlocking Technology for the Global Goals](#), World Economic Forum, Jan. 2020

[What Key Technologies are unlocking Sustainability in your Sector](#), Bain, Mar. 2022

Energy Transition

Energy Transition Investment Trends 2024, Bloomberg NEF, Jan. 30, 2024.

Climate Tech

[The Future of Climate Tech](#), Silicon Valley Bank, 2024

[The State of Climate Tech in H1 2024](#), CTVC, July 8, 2024

Financing Cleantech

[Explainer: The “Valley of Death” and the Challenges of Scaling Climate Tech](#), Bryson Wiese, Cleaner Energy Finance Forum, Mar. 28, 2022

[What would it Take to Scale Critical Climate Technologies](#), McKinsey, Dec. 2023

[From Idea to Impact](#), BCG/Bipartisan Policy Center, May 2024