KPPI-936: Sustainability Across The Enterprise, Spring 2020

Overview

Sustainability Across The Enterprise is an ‘enhanced experiential learning course.’ Teams of 3-6 students work on live sustainability projects with client organizations, under the joint guidance of a client liaison and the Kellogg instructor. Two 2 hour cross-project class workshops provide a foundation in corporate sustainability. In addition to the project component, you can optionally attend four 1 hour tutorials on sustainability topics selected through a class survey. The split between the project and the class components is about 80:20 (or 90:10 if you do not attend the tutorials).

The course is designed for MBA students with an interest in environmental sustainability, or industries in which natural resources and their sustainable management are at the core of business. This includes, for example, energy, food & agriculture, real estate, and transportation industries. The projects, as well as the class sessions, emphasize the integration of sustainability principles in managing for-profit companies.

Enrolment for this class is via application for specific projects only. The projects are listed on the course Canvas page. The list of projects is updated weekly, since there are a few late arriving projects that will be added. Applications open on February 14, and applications will be processed on a rolling basis until March 13. Earlier applicants have the greatest chance of acceptance in the project of first choice.

You can apply as an individual or as a team. I normally honor team applications, but I may ask teams to consider adding individual applicants. You can apply for only one project or rank several in order of preference. I want to make the application process as simple, expedient and unbureaucratic as possible. To apply (or for any other enquiries), please simply send an email to the instructor klausweber@kellogg.northwestern.edu, with the subject line 'KPPI 936 Application'. In the application email, include the following:

- The project of projects that you are interested in (if more than one, please rank them)
- Your current resume
- A two to three sentence statement about a) why your are interested in the project(s), b) any relevant skills you would contribute, c) any foreseeable conflicts of interests or NDA issues.

Once formed, each team confirms and refines the scope of the project with the client before the start of the spring quarter (minimal time requirement). All project work takes place during the spring quarter. There are no pre-requisites for the class. At the team-level, some expertise relevant to the project is desirable.

The course is ideal for students seeking:
• experience with managing business and sustainability in an integrated fashion
• an general introduction to sustainability issues in target industries or functions
• to expand their resume and contacts
• looking to work in a sustainability related job or industry after graduation

Format
The course is entirely centered on the project. Most of the work will occur in your own time, in team meetings and client calls. Occasionally, work may be carried out on the client site, but that is not required or normally expected. You have regular meetings with the faculty advisor and the client contact (normally via weekly conference calls, and at a time of mutual convenience rather than during the advertised class times). At the end of the quarter, students present to the client and to the class. We meet during the class times only on the dates listed below.

By then end of the first week of the spring quarter you will sign an agreement of understanding with the client organization that defines the scope, timeline and deliverables of the project. A mid-term progress presentation and workshop with the other teams in the class occurs in week 5. At the end of the quarter you present to the management team of the client organizations and (in reduced from) the class. In most instances, the client presentation will be to members of the senior management team.

Team and Client Meetings

Most clients schedule a weekly conference call. That call is attended by the team and the faculty advisor. A separate meeting of the project team and the faculty advisor often happens in conjunction with that call (e.g., 30 minutes right before or after the call). The entire team is expected to normally participate in meetings in a timely and prepared fashion, though other work is normally divided up between team members. The meeting times for the client call and team meeting are flexible. Normally, they are scheduled at the beginning to the quarter for planning certainty. It is your responsibility to schedule team meetings and to organize work as necessary.

The Role of Faculty Advisor

You are expected to manage the project independently in collaboration with the client project liaison. The faculty advisor’s role is to help you structure and solve problems, to help avoid and remove roadblocks, to intervene in the case of conflicts within the team or with the client, and to suggest appropriate resources, such as experts and materials applicable to the project. The faculty advisor is not the project manager – you own the project and are ultimately responsible for progress and deliverables. The faculty advisor participates in all communication with the client and meets with the team once a week for about 30 minutes (and more often if needed).

Lecture Sessions

In addition to the project-based work, there are three required class sessions, on Thursdays, 6:30-8pm:

• Week 1 (April 2), Introduction and logistical issues
• Week 5 (April 30): Project update presentations/workshop
• Week 10 (June 4): Final project presentations to the class

Lastly, I will offer up to four 1 hour optional 'tutorials' on sustainability topics selected through a survey of enrolled students. These are compact introductions to topics such as Green consumer behavior, sustainability reporting, life cycle analysis, circular economy, etc. These will happen during the Thursday night class time over the first three weeks of the quarter. Attendance is optional.
Expenses

Client organizations are expected to cover any project related expenses, such as travel, international calls, or purchase of data or reports, if necessary. Please verify with the client about their policies.

Course Packet and Canvas

There is no course packet for the class. I may make distribute any background readings for the tutorial sessions available via Canvas, but these are optional background resources.

Assignments and Grading

The grade in this course is heavily weighted to the quality of the final team report delivered to the client. Deliverables will be evaluated by the faculty advisor and by the client companies via a confidential project assessment survey. Client relationship management is part of the client survey. Each group also performs a peer evaluation of members’ contribution and individual grades are adjusted accordingly.

<table>
<thead>
<tr>
<th>Grade Component</th>
<th>Weight</th>
<th>Due</th>
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<tbody>
<tr>
<td>Final recommendations report</td>
<td>70%</td>
<td>(week 10)</td>
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<tr>
<td>- Faculty advisor grade</td>
<td>35%</td>
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<tr>
<td>- Client assessment</td>
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<tr>
<td>- Peer evaluation adjustment*</td>
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<tr>
<td>Team and class participation</td>
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<td>Total</td>
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*10% is equivalent to one letter grade. Project teams evaluate the each team member’s contribution at the end of the quarter. The default is equal contributions, and the group average adjustment is 0, hence upward adjustments for one member lead to automatic downward adjustments for the others.

Adding and Dropping the Class

Due to the project-based and client-facing nature of the course, please apply only if they are reasonably certain they will take the class and work on a project. You cannot drop the class once the quarter has started. Not only would you leave your teammates under-resourced for the project, you would also disappoint client expectations and damage the Kellogg brand with potential recruiters. If you are unsure about your commitment to the course when applying, please clearly indicate so in the application letter or email me. This will no disadvantage you but allows me to plan and find a suitable solution.

Kellogg Honor Code

All students are expected to adhere to the Kellogg honor code. In particular, be reminded to provide references for research, data, graphs and quotations taken from other sources. This includes documenting sources in PowerPoint presentations as well as other written reports and client correspondence. Plagiarism is a serious breach of the Kellogg honor code.
Client Confidentiality and Conflict of Interest

The information you will receive from client companies is considered proprietary and strictly confidential. Students are expected to sign confidentiality agreements requested by the client organizations, and make all reasonable efforts to protect non-public client information and destroy or return all information at the conclusion of the course if the client so requests. If team members wish to share confidential information among them, it is recommended that they use a shared workspace that is password protected. In addition, students are required to disclose upon applying or whenever it arises, any conflict of interest due to past or future employment for competitors or other reasons.

Clients and Project Descriptions

All projects are open to individual and team applications. Applications are accepted starting February 14 and until the end of the winter quarter, March 15.

You may request only one project or rank several, and I will do everything I can to honor your preferences. By submitting an application, you agree to work at any firm that you include in the application. You may modify your project selection and ranking until you are member of a confirmed team and that project is closed.

If you apply as part of a team, please name the other team members in the applicant statement, or better, send all applications together. Feel free to also email me with questions. Each member of a team must include the complete application documents. I reserve the right to add team members that applied individually.

Applications are reviewed on a rolling basis and acceptance and project assignments are made continuously throughout the application period. The client companies have the right to reject students due to concerns of confidentiality or qualification.

You will be notified of provisional acceptance as soon as project teams of sufficient size are formed. After you confirm, I ask the registrar to enroll you to the course, which can take 1-2 business days to be processed. Please contact me directly if you need a status update at any time before.

Consider registering for other classes as if you were not accepted to KPPI-936, yet be prepared to drop a course or two if you are accepted. You may not drop this course once you are matched and confirmed.

Project descriptions can be found on the following pages. The list of available projects will be updated weekly with deletions of projects that have been assigned as well as a few additions. For current information, please consult the course home page: https://canvas.northwestern.edu/courses/101337.

Overview of Projects

| Invenergy – DER RE100 Customer Segmentation | Forthcoming Projects (added by 2/20) |
| AES – DERMS-As-A-Service                  | S&C Electric                          |
| AES – Net Zero or Zero Carbon Energy      | Accenture                              |
| PepsiCo – Emissions Abatement Cost-Benefit| Good Food Institute                    |
| PepsiCo – Sustainable Agriculture Branding| Waste Management                       |
| eIQ Mobility – Growth and Sales Acceleration |                                      |
| eIQ Mobility - Market & Competitive Analysis |                                   |
Invenergy: RE100 Customer Segmentation for Distributed Energy Resources

Invenergy Company Background
- Invenergy is the largest privately-owned renewable energy project developer in North America
- Since its founding by Michael Polsky in 2003, Invenergy has developed over 24,000 MW of large-scale wind / solar farms, natural gas power plants, and battery energy storage facilities
- Invenergy operates many of its projects through a mix of on-site technicians and remote operators in its control center in Downtown Chicago
- While Invenergy has traditionally focused on development of large-scale projects, there is a new business line, Invenergy Edge, to pursue smaller, distributed energy resource (DER) projects

DER Market Background
- Any small-scale energy resources that are sited on an end-use customer’s premises (behind the meter) or within an electric utility’s customer territory (front of the meter) are broadly referred to as “distributed energy resources”
- DERs include small-scale battery energy storage, distributed generation (e.g. rooftop solar, backup generators, fuel cells), energy load controls (e.g. Nest thermostats), and other systems to control a customer’s power usage and supply from the grid in a way that saves the customer money, increases the customer’s electricity resiliency or provides back-up power, and helps the customer achieve sustainability goals
- The DER market value chain is roughly comprised of the following:
  - Equipment suppliers – Companies that manufacture DER hardware such as solar panels and battery systems
  - Software suppliers – Companies that build software and analytics to manage, optimize and aggregate distributed energy systems
  - DER project developers (Invenergy Edge) – Companies that originate customers, design/engineer/construct projects (integrating equipment and software from suppliers above), operate projects, and arrange financing (if necessary)
  - DER customers / capital providers – Companies that ultimately pay for the DER installation (commercial customer, electric utility, third-party financier, etc.)
- The falling costs of distributed generation and storage and the increasing technical capabilities for data analysis and integration mean that DER implementation will grow as more and more customers are able to save money from the installation of DER

Project Scope
- Students should create a market segmentation and market entry strategy for Invenergy to develop Distributed Energy Resources (DER) projects specifically for members of the Renewable Energy 100 (LINK) taking into account both customers’ needs and Invenergy Edge’s approach and offering to the market.
- To segment and prioritize the RE100, students should segment the RE100 into groups that have similar needs for DER implementation, then identify and prioritize specific facilities operated by the high priority firms based on attributes of the facilities and location in high priority DER regional markets as identified by Invenergy Edge team.
  - Previous experience implementing DER projects and public goals to implement electric vehicle fleets should increase the priority ranking of those firms
- The customer and facility prioritization will take into account both specific segment’s ability to realize value from DER and specific electricity market structures that enable DER to realize value.
Customer typically realize value through lower electricity bills, higher resiliency and uptime, sustainability target achievement, etc.

Market structures can be retail (energy sales, customer services, etc.) or wholesale (capacity market, frequency regulation market, demand response market, etc.)

**Deliverables**

- A detailed slide deck that comprehensively outlines the entire strategy with relevant research materials in the appendix. Deck should have enough detail so that it could be understood even without a presenter. Key items to include are:
  - Recommendations on which segments within the RE100 should be targeted in the next 1-2 years vs. 3-5 years
  - For near-term target customer segments (1-2 years), provide list of specific customers and facilities where Invenergy Edge should first focus
    - List of technologies or offerings best suited to the target markets
  - Specific strategy on how to approach and successfully engage key customers (may include brand strategy)
- The prioritization tool and methodology used
- Verbal presentation to management of the detailed slide deck
- Reports and other references used to construct the slide deck (if publicly available)
AES: DERMS-As-A-Service

Context

Distributed Energy Resource Management System is a platform that helps utilities and distributed system operators to manage their grids and identify renewable phantom load generated from behind the meter. The sources of phantom load can be battery storage systems, solar (including community solar), EV, and any microgrid solutions deployed by small to medium size businesses.

Deployment and maintenance of DERMS require high capital investment and cannot be supported by medium size utilities, and so a new platform/solution called DaaS (DERMS-As-A-Service) is emerging, which can deliver the outcomes of DERMS with operating expenses.

DaaS Overview

- DaaS provides visibility for DR, EV, DER, Storage, C&I EE systems etc. (the DER fleet) for service provider
- DaaS service provider controls and optimizes the DER fleet
- Customer inherits EE, DR, EV and DER programs and requirements as they acquire customers
- DaaS operation is largely automated based on business rules and requests/requirements of the SC and the forecasts of load and energy usage
- DaaS functions inside of an existing staffed control center facility and can share FTEs within that function

Project Scope

1. Create a tool for the identification, segmentation, and prioritization of potential DER customers to aid AES for potential entry into the DER market as a cloud based as-a-service solution provider
2. The tool should be used to answer the key questions listed below:
   i. What geographies / markets / utility service territories should AES focus on?
   ii. In the identified geographies / markets / utility service territories, which customer segments should AES focus on?
   iii. Within US, define TAM across CCAs, Municipal Utilities, and Cooperatives
3. To identify and prioritize attractive customer segments and geographies students should take into account both specific customer segments and specific electricity market structures that enable DER to realize value.
   i. Market structures can be retail (energy sales, customer services, etc.) or wholesale (capacity market, frequency regulation market, demand response market, etc.)
   ii. Customers typically realize value through lower electricity bills, higher resiliency and uptime, sustainability target achievement, etc.

Deliverables

- A detailed slide deck that comprehensively outlines the work performed and answers of the key questions with relevant research materials in the appendix. Deck should have enough detail so that it could be understood even without a presenter. Key items to include are:
  o Screening process and methodology used to identify and prioritize attractive geographies / markets / utility service territories for DaaS deployment
  o Recommendations on which combination of geographies, markets, utility service territories, and customer segments of AES should target in the next 1-2 years and 3-5 years (near-term and medium-term focus areas). The recommendations should be prioritized within the two-time ranges.
  o Competitive Landscape and M&A gameboard (only if time permits)
- Excel model of the segmentation and prioritization tool
  o Other modeling software could be used as well (e.g. Tableau or Microsoft BI)
- Verbal presentation to management of the detailed slide deck
- Reports and other references used to construct the slide deck (if publicly available)
AES: Net Zero or Zero Carbon Energy?

Context

Procuring renewable energy allows customers to achieve net-zero energy targets; however, it has minimal impact on lower-carbon energy usage because customers all the time rely on the grid to manage demand, which is still powered by thermal resources.

To choose cleaner electricity, it is essential to understand when the grid is generating clean energy and is their flexibility to use energy when the grid is abundant with clean energy.

Is it possible to measure and determine the grid energy supply mix that can be passed down to the end customer to make appropriate low carbon energy decisions?

Problem: Net Zero Energy or Zero Carbon Energy. Can we achieve both?
1. What is essential to achieve sustainable goals – Net Zero Energy or being Zero Carbon energy? How does it compare? What is vital for sustainable purposes.
2. What could you do to achieve Zero Carbon energy? Is it achievable?
3. How to measure Zero Carbon energy?
4. What information do we capture from the grid supply mix so that we can predict and allow flexible devices to rely on clean energy?

Opportunity Statement:
1. Help customers measure, manage, and minimize their carbon footprint.
2. Aggregate generation/supply mix data to deliver context and nuance
3. Provide comparison tools – Net Zero vs. Zero Carbon to achieve environmental impacts
4. Facilitate zero-carbon usage with devices triggers automatically based cleaner energy supply in the grid.

Scope of Work and Deliverables for Student Team
1. Perform research to measure, predict, and incentivize this concept.
2. What are the necessary data points to measure the carbon impact within product design and composite scores for carbon performance?
3. Identify and evaluate the potential value streams for sustainable goal measures for a corporation that compares net-zero vs. zero carbon. Manufacture zero-carbon devices?
4. How to drive adoption within sustainable goals.
5. Project the potential value of the platform for corporations to utilize this data to develop sustainable goals, potential customers that use platforms like Arcadia power to swap thermal to green energy sources, and IoT device manufacturing integrating to clean energy sources.
PepsiCo, Inc. Project - Emissions Abatement Cost-Benefit Analysis

Background:

PepsiCo, Inc. is a global Food and Beverage leader whose products are enjoyed more than 1 Billion times a day in more than 200 countries. Offering a broad range of foods and beverages, our portfolio includes 22 brands that generate more than $1B each in estimated annual retail sales.

Central to PepsiCo’s performance is our commitment of Winning with Purpose – which is our belief that sustainability can be an even greater contributor to the success of our company. Especially in areas where we can impact and drive systemic change, including advancing sustainable agriculture practices, supporting a holistic strategy for the creation of a circular economy, striving for positive water impact, and continuing to make our products more permissible to our consumers.

Of particular interest for this project is our climate goal to reduce our absolute emissions across our value chain by 20% by 2030 against a 2015 baseline. To do this, we are focusing our efforts in the particular hotspot areas of our emissions in categories like agriculture, packaging and transportation & distribution. We have identified a number of levers within this these areas that will help the company drive progress and reach our goal.

Problem Statement:

One challenge with achieving our climate goal is the understanding internally of the business implications of our climate levers. Several cross functional teams and leadership are involved in our climate strategy and advancing the implementation of activities that lead to emissions reductions within our operations as well as in the supply chain. It is important for all stakeholders involved to have a better understanding of the costs and benefits of the various activities and to have a PepsiCo specific carbon abatement cost and benefit curve.

Project Scope:

Tentatively, the student team will provide the following:

- Review past internal efforts undertaken on determining the business costs for the various levers for climate by business unit
- Update cost analyses for the various levers through internal as well as external research to develop a climate cost model and an abatement curve for PepsiCo overall and by business unit
- Add benefits (qualitative as well as quantitative) of the various climate levers and develop a cost-benefit curve for PepsiCo as well as the business units

Deliverables:

To be further refined depending on student group skillset and interest

- PepsiCo climate cost-benefit model and curve overall and by business unit
- Develop a modular presentation that can be used by the PepsiCo climate team for internal communication with various stakeholders and business units
PepsiCo, Inc. Project - Unlocking Brand Engagement with Sustainable Agriculture

Background:

PepsiCo, Inc. is a global Food and Beverage leader whose products are enjoyed more than 1 Billion times a day in more than 200 countries. Offering a broad range of foods and beverages, our portfolio includes 22 iconic brands that generate more than $1B each in estimated annual retail sales.

Central to PepsiCo’s performance is our commitment to ‘Winning with Purpose’ – which is our belief that sustainability can be an even greater contributor to the success of our company. Especially in areas where we can impact and drive systemic change, including advancing sustainable agriculture practices, supporting a holistic strategy for the creation of a circular economy, striving for positive water impact and continuing to make our products more permissible to our consumers.

For this project our desire is to build upon our Sustainable Farming Program where we strive to advance environmental, social and economic benefits to farming communities around the world by supporting practices and technologies that promote improved farmer livelihoods and agricultural resiliency. To learn more please visit www.pepsico.com/sustainability/agriculture

Problem Statement:

The challenge we would like to address with this project is to meet the aspirations of Winning with Purpose by leveraging our Sustainable Farming Program to create an impactful brand engagement strategy.

Project Scope:

The proposed approach for this project includes:

• The focus would be on 3 markets with iconic brands including the Doritos brand in the U.S., Walkers in the U.K. and Sabritas in Mexico.
• Completion of a landscape assessment of consumer messaging leveraging sustainable sourcing of agricultural raw materials including topics such as climate smart agriculture, regenerative agriculture, water conservation, farmer livelihoods, locally grown, etc.
• The analysis should include insights into how large CPG companies are measuring and communicating the impact of their sustainable agriculture efforts through their brands to reach a broad set of stakeholders including consumers, customers, investors, NGOs, and civil society.
• The project should also include an evaluation of the methodology for this engagement through vehicles such as on-packaging messaging, company websites, sustainability reporting, social media, annual financial reports and Environmental, Social & Governance (ESG) metrics.

With this as a framework we would look forward to co-creating and refining the scope with the team upon initiation of the project.

Deliverables:

A Strategy to elevate consumer engagement through our Sustainable Farming Program with linkage to our on-the-ground impact programs promoting livelihoods and regenerative agriculture practices with farmers. The recommendations should build on the landscape scan referenced above and should include recommendations on how PepsiCo can demonstrate Winning with Purpose through the brand strategies developed in each key market. These deliverables would be further refined depending on student group skillset and interest.
eIQ Mobility: Two Project Options

Industry context
In the US, corporate & public fleets represent ~15 million vehicles, and 296 Billion miles driven per year. Based on vehicle cost per mile, that’s a $200 to $250 Billion industry. Managers of traditional fleets (internal combustion) have years of institutional knowledge of how to optimize their operations. But in an Electric Vehicle environment, fleet executives now need to include data from charging infrastructure, facilities, utilities & rates, incentives, policy, new vehicle costs, different insurance, etc. That data is difficult to collect, and there are no analytical systems to learn. At the same time, the e-mobility market is exploding and has become the new battleground for established OEMs and emerging players. E-mobility for fleets is unique and particularly exciting, since fleets have highly predictable routes (thus predictable EV charging requirements), often are based in hubs (thus large-scale charging systems with potential grid services), and belong to large corporations (thus attractive for capital).

About eIQ Mobility
eIQ Mobility (www.eiqmobility.com) was started in 2018 when the founders discovered that corporate fleet leaders faced unique roadblocks to electrification. Based in Oakland, California, the team consists of data scientists, developers, and experts in energy optimization, utilities, EV, and finance. The company’s advisors come from SaaS, VC, trucking, EV, and fleet consulting.

eIQ Mobility has 18+ major fleet customers, with EV feasibility results for 45,000+ vehicles, 2.5+ million trips, and close to 300 million miles. Customers include: package delivery, cable, auto manufacturer, technology, beverage, snack food, public and school transit, pharma, renewables, Fortune 500 tech services, several major US utilities, global facility management, and distributors.

Project descriptions and scope of work
eIQ Mobility may select Kellogg teams for one or both of the following projects, based on team skill, fit and experience. In all cases, the teams with work with the VP Business Development and Director of Product. Final presentations will be with the CEO and exec team.

Project 1: Growth and sales acceleration strategy
Define a suite of client targets for eIQ Mobility to pursue based on their strategic value, short-term vs. long-term potential to close. These include Fortune 500 fleets, utilities, auto OEMs, etc. Audit the current sales process, KPIs and tools, and provide recommendations to improve or supplement them.

Project 2: Market landscape & competitive analysis
Create a strategic framework for the North American Fleet and Electric Vehicle landscape, including EV OEMs, EV chargers, startups, telematics, utilities, O&G giants, Leasing companies, etc. Define the current and future competitive landscape and potential partners.

Deliverables
We ask the team to propose a project process and specific deliverables they see as valuable and realistic. This approach has worked well in previous projects with Kellogg. eIQ Mobility is a data-science based startup and as such we value fact-based work, analysis and recommendations. The project can involve 3rd party research, Voice-of-Customer, or finding potential pilot customers for data collection.

Useful team skills & experience
Automotive, trucking, mobility, grid, utility & energy markets, fintech, asset leasing.