GIM Energy, Development, and Climate Change: Ghana and Morocco

Winter 2019
Mondays, 6:30 – 9:30 PM

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Office hours: By appointment
GIM Program Purpose and Objectives

GIM Purpose:
To provide Kellogg students with a unique opportunity within the Kellogg academic portfolio:

- To develop a foundation of knowledge about global sectors, economies, and the underlying forces that shape them through classroom learning;
- To apply those classroom learnings and develop independent insights and appreciation for diverse business practices and challenges through business and cultural exposure in country.

GIM Objectives:

- To gain a foundational understanding of the macroeconomic trends, politics, history, and culture of a country or region outside the United States and the impact of these factors on the business climate of those countries.
- To experience through classroom sessions and firsthand through meetings with government officials and business leaders unique insights into the business ecosystems and practices and challenges and opportunities of key business players in a particular country or region.
- To develop an understanding of an evaluative framework related to a particular business topic or issue and learn how to apply this framework to developing markets over both the course of GIM and in the future.
- To develop skills to research and network with relevant organizations on a subtopic related to the course content and work with a small group of peers to engage in independent business meetings with key stakeholders in order to analyze and propose a solution to a particular business problem.
- To collaborate with peers from diverse academic programs; leverage individual experiences, skills, and networks in order to achieve balanced contributions to a group project, an inclusive environment, and obtain a successful academic outcome.
Course Description and Objectives

Course Objectives

This course will give students an opportunity to explore the following questions:

- How can developing nations expand access to electricity for all segments of their economies?
- What is the relationship between economic development and energy access?
- What role should renewable resources and energy storage technologies play in expanding energy access?
- How should international efforts to mitigate global climate change be factored into the decisions of developing nations?
- What financial and commercial models are being used to increase energy access in developing economies?
- What is the relationship between government policy and energy access in developing economies?
- What tools can help us understand the economics, investment needs, and political ramifications of these intertwined issues?

Topic Description

Electricity is a critical element of industrialized life—perhaps the most critical. Without it, nothing else works. Water, sanitation, food, healthcare, education, entertainment: without power these activities grind to a halt.

There are roughly 1.5 billion global citizens who have no electricity at all. There are another couple of billion whose access is inadequate. There is a strong relationship between energy usage and economic well-being. Reliable, cost-effective electricity is widely seen as a necessary precursor to economic development.

In the OECD—the coalition of 36, mainly Western, developed economies—per capita electricity consumption is around 8,000 kilowatt-hours (kWh) per year. By contrast, in North Africa, this figure is closer to 1,600 kWh per year. And in sub-Saharan Africa, the average is a mere 500 kWh/year. These stark differences are mirrored by similar gaps in per capita GDP and income.

By 2050, the world is expected to need about twice the total energy we now consume. Almost all this growth is expected to take place in developing economies, and for this development to occur, electricity supply will need to be vastly expanded. In the past couple of decades, the economy of China has roared ahead. Chinese GDP and income per capita have grown, along with a vast expansion of energy supply, much of it in the form of electric power. Many developing nations aspire to follow the Chinese path. A different drama is playing out in the developed world, but one that has implications for developing economies.
Electricity markets in the developed world are in the midst of a transformation that began in the late 1970s. At that time, nations and states began to change the ways in which electricity markets are structured and regulated, with the goal of increasing competition and reducing monopoly. Technology has evolved, and the development and deployment of new supply-side technologies (including renewables) is also a main driver of transformation. Innovations on the demand-side, such as energy efficiency, demand management, energy storage, and “smart” technologies, are also key agents of change. Finally, environmental regulations have altered the landscape, and efforts to reduce man-made greenhouse gas emissions have moved to center stage in the global political theater.

The most aggressive deployment of renewable energy has occurred in the developed world, best exemplified by Germany and several US states, including California and Texas. In the same vein, the most aggressive policies aimed at reducing emissions linked to climate change have also emanated from the developed West. There is often an explicit link assumed between these initiatives. Renewable energy is assumed to equal climate mitigation. There is also an assumption that international economic development must occur in a way that does not adversely affect global climate. In fact, there are advocates who argue that energy options for developing nations should be restricted to wind, solar and storage. There is tension between the behavior and policy objectives of the wealthy west and the poorer, developing world; one of the key objectives of this course will be to better understand the dimensions of this tension.

We will visit two African countries to better understand the electricity-development-climate nexus. Morocco, the westernmost country in North Africa is mainly reliant on fossil-fuel for electricity production, most of which is imported. However, Morocco has significant potential for both solar and wind, and has established ambitious renewable energy objectives. Per capita electricity consumption is around 900 kWh per year.

Ghana, located in West Africa on the Atlantic coast, struggles with electric supply reliability and is attempting to improve this situation. About half of Ghana’s electricity supply comes from fossil sources, with the balance coming from renewables, most of it hydroelectricity. Ghana has also established renewable energy targets but has goals for improving rural energy access and overall supply reliability, as well. Per capita electricity consumption in Ghana is around 320 kWh per year.

**Course Expectations/Guidelines**

Students are expected to complete all reading assignments, attend all lectures, and engage with speakers and classmates. This should be a collaborative learning experience, and one in which all participants responsibly carry out their responsibilities.

During lectures and discussions, this will be a screen-free course. Laptops, tablets, and cell phones are not permitted during these activities. A portion of each class period will be allocated to group work, during which time electronics are permitted (for class related work!).

Attendance Policy

Due to the nature of the GIM program, attendance for all GIM classes is mandatory, as is participation in the 10–day field trip. Attendance on the first day of class is also mandatory. If a student misses more than one class throughout the term, one letter grade will be deducted from his or her final grade. Exceptions may be made by the faculty member in cases of extreme circumstances.

Role of the In-Country Advisor

Throughout your GIM trip, you will be accompanied by an in-country advisor, Arlene Johnson, who is chief-of-staff for Kellogg interim dean, Kathleen Hagerty. The in-country advisor is responsible for the integrity and quality of the in-country experience. Among other logistical roles during the trip, he or she will be assessing each student’s level of participation during the plenary meetings and will be assigning 15% of the students’ overall grade.

Kellogg Honor Code

The students of the Kellogg School of Management regard honesty and integrity as qualities essential to the practice and profession of management. The purpose of the Kellogg Honor Code is to promote these qualities so that each student can fully develop his or her individual potential. Upon admission, each student makes an agreement with his or her fellow students to abide by the Kellogg Honor Code. Students who violate the Kellogg Honor Code violate this agreement and must accept the sanction(s) imposed by the Kellogg community.

The Kellogg Honor Code is administered by students and is based on the concept of self-government. The efficacy of such a student-administered honor code is dependent upon a high degree of dedication to the ideals of honesty, integrity and equal opportunity reflected by the code. The Kellogg Honor Code requires that each student act with integrity in all Kellogg activities and that each student hold his or her peers to the same standard. In agreeing to abide by the code, the Kellogg students also agree to report suspected violations. By not tolerating lapses in honesty and integrity, the Kellogg community affirms the importance of these values.

Course Materials
## Course Schedule and Assignments

### Week 1  January 7

<table>
<thead>
<tr>
<th>Lecture</th>
<th>“What question are we answering?”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>• Overview of the electricity-development-climate nexus</td>
</tr>
<tr>
<td>Guest Lecturer</td>
<td>None</td>
</tr>
<tr>
<td>Advisor</td>
<td>Trip overview, to-dos</td>
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<tr>
<td>Class Activities</td>
<td>• Course overview, expectations</td>
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<tr>
<td></td>
<td>• Introductions</td>
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<tr>
<td></td>
<td>• Project team assignments and discussion of project objectives</td>
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<tr>
<td></td>
<td>• Discussion of county-specific presentations by teams (2/11)</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
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</tbody>
</table>

### Week 2  January 14

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Screening of documentary “Juice”</th>
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</thead>
<tbody>
<tr>
<td>Focus</td>
<td>• “Juice” explores the role that electricity plays in the modern world</td>
</tr>
<tr>
<td>Guest Lecturer</td>
<td>Robert Bryce, Author and Producer</td>
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<tr>
<td>Advisor</td>
<td></td>
</tr>
<tr>
<td>Class Activity</td>
<td>• Discussion with Robert Bryce</td>
</tr>
<tr>
<td>Reading</td>
<td>January 14</td>
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</tbody>
</table>

No class January 21 (Martin Luther King Day)

### Week 3  January 28

<table>
<thead>
<tr>
<th>Lecture</th>
<th>“Electricity 101: Physics, Economics, Market Structure and Policy”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>• Basic electric system physics</td>
</tr>
<tr>
<td></td>
<td>• Basic system economics</td>
</tr>
</tbody>
</table>
• Historic and current market structures
• Why renewables? - economic and policy drivers
• Overview of current Ghana and Morocco electricity situation

**Guest Lecturer**
None

**Advisor**

**Class Activity**
• What is cost effective?

**Reading**

**Assignment**
• Topic proposal due

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**Week 4**  **February 4**

**Lecture**
"To have, to have a little, to have none: the challenge of global energy access?"

**Focus**
• What technologies do we need for increased global energy access?
• What will electricity systems look like in developing economies?
• How do we balance development needs with environmental objectives?

**Guest Lecturer**
Kirsty Gogan, Energy for Humanity

**Advisor**

**Class Activity**
• Future demand scenarios for Ghana and Morocco

**Reading**

**Assignment**

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**Week 6**  **February 18**

**Lecture**
• “Climate Math: What does deep decarbonization look like?”

**Focus**
• What does current best science tell us about how deeply carbon must be
reduced to stabilize climate?

- What does this science imply for the role of renewables and other resources in achieving global targets?
- What does Paris mean for achieving these goals?

**Guest Lecturer**
- Armond Cohen, Executive Director, Clean Air Task Force

**Reading**
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No class February 25

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### Week 7 | March 4
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| Lecture | 
| Focus | 
| Guest Lecturer | 
| Advisor | 
| Class Activity | 
| Reading | 

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### Week 8 | March 11
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| Lecture | 
| Focus | Pre-departure preparation
| Guest Lecturer | None
| Advisor | 
| Class Activity | 
| Reading | 

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**In-Country Field Research - March 20th – March 28th**

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**Final Class**
- [tentative date 4/10/19 9:30-12:30]

**Topics:**
- Debrief of In-Country Experience; IPG presentations

**Speaker:**
Assignments:
Final project presentations; written report, peer evaluations, and IPG database google sheet information due at 9 AM

In-Country Academics

Students are reminded that GIM is first and foremost an academic program. 15% of your overall grade will be based on your participation in the plenary meetings and engagement in other activities as assessed by the in-country advisor. In order to achieve a high grade, students are expected to not only attend all plenary meetings, but to be actively engaged during the meetings and other learning opportunities in country.

Assessment

<table>
<thead>
<tr>
<th>Research Project</th>
<th>70%</th>
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</thead>
<tbody>
<tr>
<td>Background Research</td>
<td>10%</td>
</tr>
<tr>
<td>In-Country Research Plan</td>
<td>10%</td>
</tr>
<tr>
<td>In-Class Presentation</td>
<td>10%</td>
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<tr>
<td>Written Report</td>
<td>25%</td>
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<tr>
<td>Peer Evaluation</td>
<td>12%</td>
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<tr>
<td>IPG Database Google Sheet</td>
<td>3%</td>
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<tr>
<td>Participation</td>
<td>30%</td>
</tr>
<tr>
<td>In-Class Participation (attendance, discussion, engagement)</td>
<td>15%</td>
</tr>
<tr>
<td>In-Country Participation (plenary meeting participation, student role, overall participation; determined by GIM advisor)</td>
<td>15%</td>
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GIM Research Project

The core of the GIM class is an independent research project. Groups of 4 to 6 students will select an international business, economic or management issue on which to study in depth and present. The students begin secondary research at the start of the course, incorporating perspectives from the class readings and speakers. They will also spend considerable time in-country speaking with resident experts, gathering local data, and testing their hypotheses and recommendations in the field. In general, the project should be based on original research that contributes to an intellectual body of work but also strives to have practical applications for the market.

(Students must schedule at least five IPG meetings throughout their trip with at least one meeting in every
city that class visits on a business day. Students are not obligated to schedule meetings in cities that the class visits only for the weekend.)

Research Topics
Student teams typically develop their own research projects, though they will refine their topics with the help and advice of their faculty member. Good GIM projects are generally built around interesting, clear, and relatively narrow research topics. Some titles from successful projects from recent years have included “How Uniqlo’s Brand Positioning and Marketing Strategy Allow the Company to Thrive in China’s Fast Fashion Market” and “Expanding Wine Sales to Middle-Class Brazilians: A Proposal to Concha Y Toro.” Weak GIM projects often have excessively broad or unfocused topics such as “An Overview of the Brazilian Beverage Industry.”

Project Report Structure
Final reports should be at least fifteen pages in length, excluding exhibits. Groups may choose from the following report formats:

- Traditional analytical research paper – A research question is described; competing answers to the question are discussed; evidence collected on the trip is used to argue for or against the alternative answers.

- Industry analysis – A particular industry is surveyed in order to examine a narrowly focused, well-defined topic pertaining to the competitive dynamics of the industry. An example would be an analysis of a market entry opportunity presented to a foreign multinational.

- Business recommendation report – A consulting report recommending specific strategic, operational and organizational actions to solving a clearly defined business issue (e.g.: strategies for overcoming cold-chain logistics and distribution challenges in India.).

- Business or industry case study – A case for eventual classroom use developed with a clear underlying business question in mind. Teams pursuing this option are encouraged to work with Case Publishing before and after the trip to ensure a high quality product that may eventually be used in the classroom.

Project Deliverables
- Research Project Proposal – Each project group will submit a 2-page description of their proposed research topic, including:
  - A description of the specific and narrowly-focused research question(s) to be
addressed
  o Description of the topic’s importance, timeliness, economic, or social significance
  o Identification of possible in-country visits with companies, governmental agencies, NGOs, etc.

• **Background Research Review** – Before departing for the in-country portion of the class, each project team must submit a review examining secondary information relevant to its research topic. This review may serve as a first draft of the background section of the final project report.

• **In-Country Plan** – This is a detailed matrix of five or more investigative research meetings arranged in country. The best plans will include day/time/location of meeting; name/description of organization; name/title/bio of interviewee; agenda and interview guide for each meeting.

• **In-Class Presentation** – During the final class, each project group will make a presentation in class summarizing their research findings. The purpose of this deliverable is to allow faculty members and students to learn about and provide feedback on the project groups’ final findings. It is suggested that each team be given 15 minutes to present and 5 minutes for audience questions and suggestions.

• **Written Report** – The final report, generally 10-15 pages long before exhibits and appendices, prepared according to one of the formats discussed above. In addition to turning in their papers to their professors, students should submit an electronic copy to the Global Programs Office on the agreed upon date.

• **Peer Evaluation** – Each member within the project group will assess every other member’s contributions to the project, including their own, with a confidential peer review form that takes into account each member’s intellectual contribution, initiative and organization, workload contribution and overall contribution.

• **IPG Database Google Sheet** – Maintained by the Global Programs’ Office, the IPG Database Google Sheet serves as a repository for IPG contact information shared amongst GIM students. About a week before final reports are due, the GPO will be sending out a link to the sheet for each IPG group to fill out with information about their contacts. Please note that the requirement for filling out the google sheet is due at the same time as the written report.