

# Community-based Sustainable Energy Projects



Client-focused Sustainable Energy Design, *Andrew Baruth*

## Program/Course Background

In 2011, the Energy Technology Program started with the question “What would an engineering-themed academic program look like if it grew out of Ignatian Sensibilities and combined the technical aspects of an engineering program with the liberal arts in the context of sustainable energy?”

Real Tools.  
Real Choice.  
Real Trust.

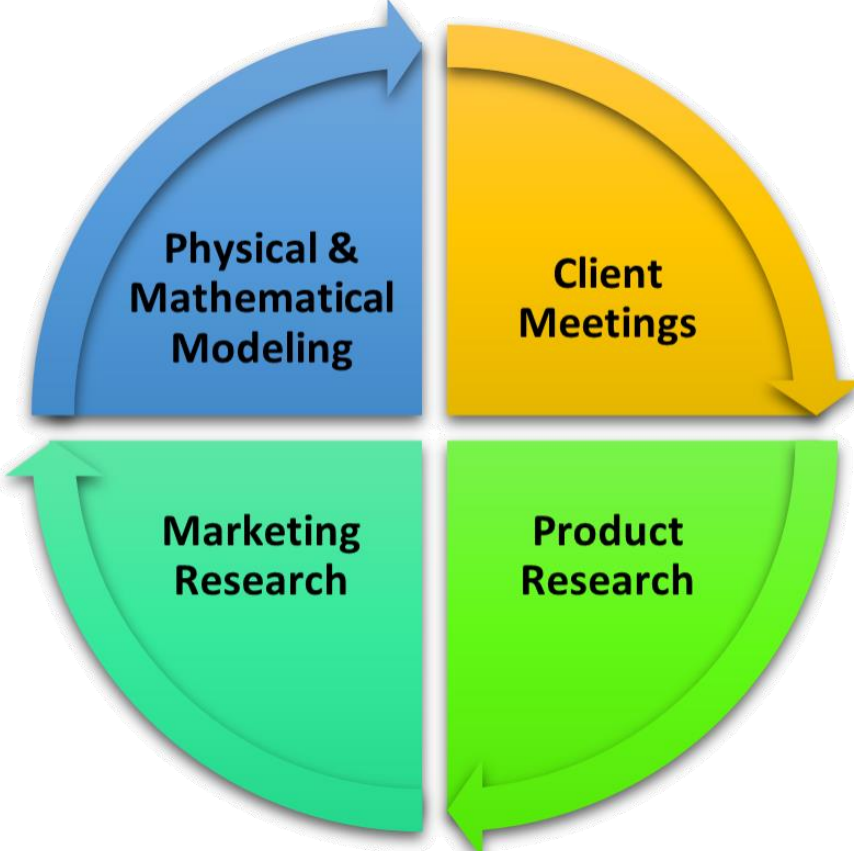


Faculty, students, and guests collaborate to design the Energy Technology curriculum

The year-long senior capstone is the Energy Innovation course, which resembles the amalgamation of a capstone from engineering, management, communications and design. The course relies heavily on real client engagement, developing client-focused solutions related to sustainable energy, and delving into discussions of *motivation* and *mindset*.

“As important as content knowledge is, along with the skills to apply it, something else is at least as important today: the set of attitudes, behaviors and motivations that enable knowledgeable graduates to work with others productively, flourish and live a purposeful life... *A good education changes what you know, while a great education changes who you are.*”

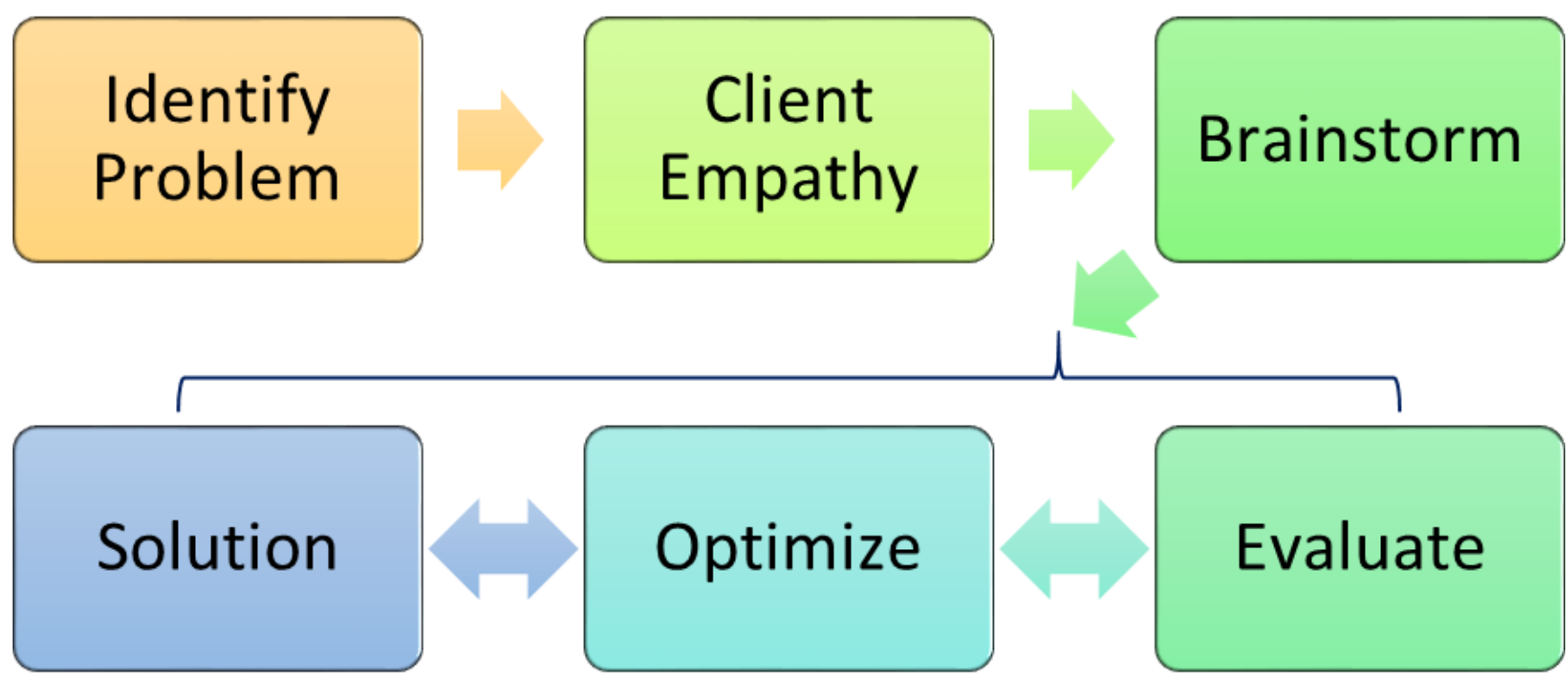
--Richard K. Miller, First and current President of Olin College of Engineering



Energy Innovation Course Actions

- Students identify four key issues when working with community clients
- 1) Why should clients listen?
  - 2) How do you turn a no into a yes?
  - 3) How do you inform an audience that is *new* to sustainable energy what their options are?
  - 4) **How do you eventually synchronize with clients?**

## Client-focused Design



Client-focused Design Process

We found ourselves mimicking the Ignatian Pedagogical Paradigm in this design process, where we had to identify the context of the problem and the associated client, develop an idea (the what), present the ideas and optimize/reflect, take action to identify potential client-focused solutions, and finally evaluate the solutions. As this was already a comfortable pedagogical strategy for Jesuit institution-taught students, it was a natural parallel to draw from.



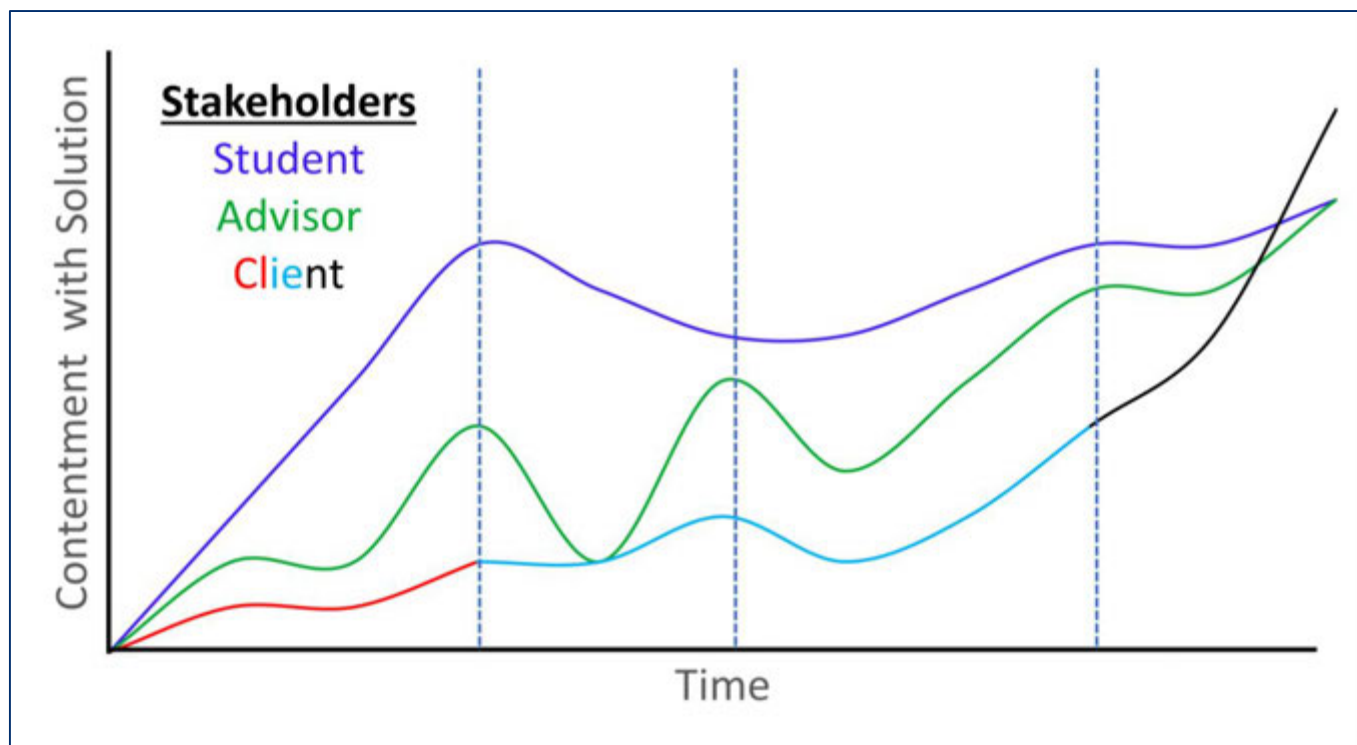
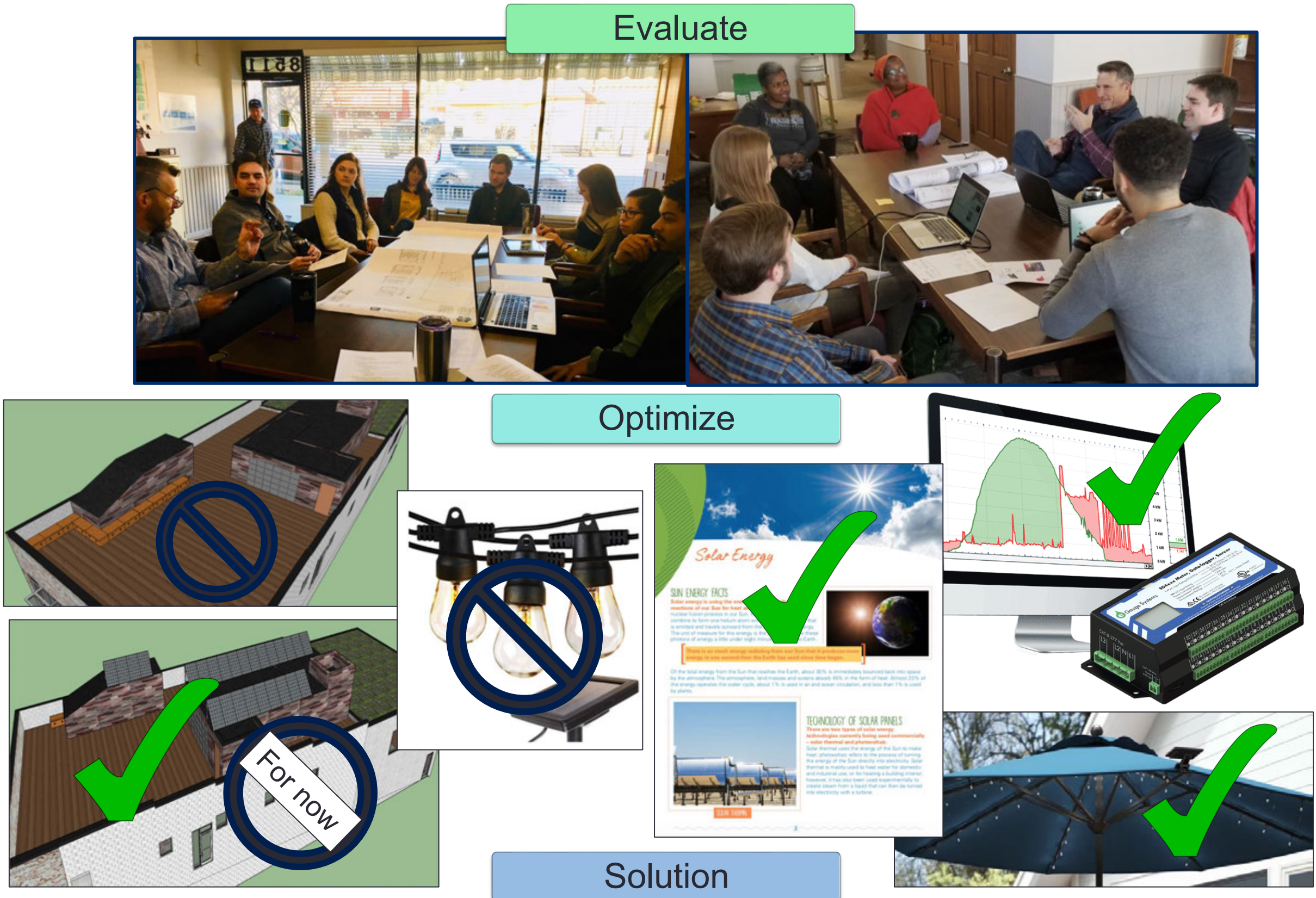
In the 2018-2019 academic year, the Energy Innovation course had three primary clients/projects:

- 1) Developing a marketing campaign for a 5 MW community solar array for OPPD
- 2) Developing a renewable energy solution for the ILAC center in the Dominican Republic (incl. maintenance)
- 3) Developing a sustainable energy strategy for the roof-top garden of the non-profit No More Empty Pots (NMEP) and their newest initiative of a Food Hub.

## Case Study and Reflections

NMEP is a grassroots non-profit corporation that connects individuals and groups to improve self-sufficiency, regional food security, and economic resilience of urban and rural communities through advocacy and action.

Identify Problem		Brainstorm
<b>Current Rate - 230 - &lt; 50 kW</b> Service Charge: \$28 Demand Charge: No demand charge	<b>Alternate Rate - 231 - &gt; 50 kW</b> Service Charge: \$19.86 Demand Charge: \$96.84 for first 18 kW \$5.38 per kW after 18 kW	Education Aquaponics
On-grid solar would have a potential ROI of 15 years on 231 rate or 21 years on 230 rate - \$17k for 8.4 kWh array – Is it worth it?		
Off-grid solutions may address need at lower cost		
Could NOT Disrupt Construction Schedule		Solar Bench On-Grid Solar Array



### Reflection

Contentment with Solution for the students, their advisor, and their client as a function of time. Vertical dashed lines indicate stakeholder meetings.

**Students eventually synchronized with clients**