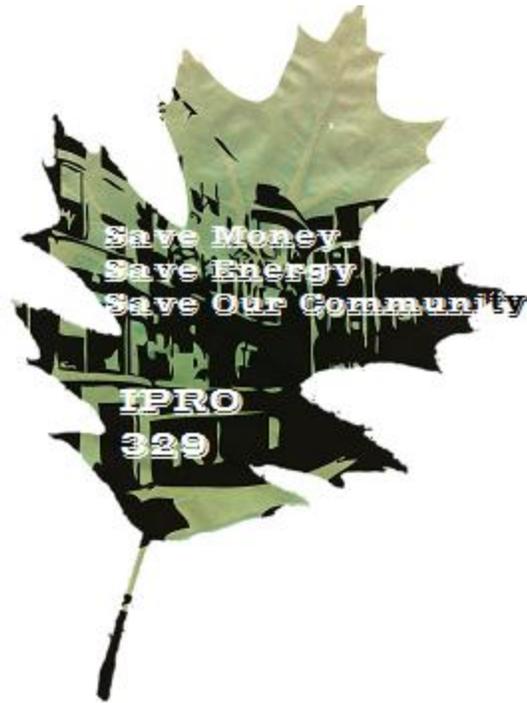


# I PRO 329: Oak Park Energy Efficiency & Carbon Reduction

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Faculty Advisor: Nancy Hamill

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	Michael Muyco	
Dawid Broda	Eric Dexter	Robert Herman
Thiago Jardim	Tae-Hoon Kim	Andrew Kungis
Colin Lakin	Seunggeun Lee	Suk-Hyun Lim
Michael Moceri	Aurash Mohaimani	Minah Park

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# I. Team Information

The IPRO 329 team consists of a diverse group of students from varying disciplines. The following is a list of each individual member's contact information, strengths, needs, and expectations from this project.

Team Member	Contact Information	Strengths	Knowledge/Skills to Develop	Expectations
<b>Dawid Broda</b> <i>IT Management</i>	dbroda@iit.edu [REDACTED]	Digital energy modeling and home energy management experience	Increase my knowledge of home energy systems	Develop myself as a strong team player and gain a vast knowledge of other skills.
<b>Eric Dexter</b> <i>Architecture</i>	edexter1@iit.edu [REDACTED]	Digital and Poster Presentations, AutoCAD, Revit, 3ds Max, Photoshop	Develop the ability to look at older homes and analyze energy usage.	To treat this IPRO as work-like and professional as possible.
<b>Robert Herman</b> <i>Electrical Engineering</i>	rherman1@iit.edu [REDACTED]	Background in electrical engineering and familiarity of Oak Park and its buildings	Gain more knowledge of how to improve home efficiency that could help me in the future.	Gain knowledge pertaining to my field of study and help educate the Oak Park residents.
<b>Thiago Jardim</b> <i>Architecture</i>	tjardim@iit.edu	Creative, Geospatial Vision, Hard working	Develop a more technical approach to sustainable development.	Gain a better understanding of all facets that pertain to this IPRO project.
<b>Tae-Hoon Kim</b> <i>Mechanical Engineering</i>	tkim14@iit.edu [REDACTED]	Presenting, design work, Adobe Photoshop & Illustrator, AutoCAD, customer relations, writing & organizing	Build my knowledge of energy efficient home design.	Gain cohesive team work skills and learn how to implement GIS into architectural projects.
<b>Andrew Kungis</b> <i>Architecture</i>	akungis@iit.edu [REDACTED]	Ability to work well with others, hard working, resourceful, disciplined, practical	Communicating through writing, Relaying thoughts and ideas to others.	Lay the groundwork for surveys to be handed out to Oak Park residents regarding energy usage. Find funding sources for Oak Park residents.

<b>Colin Lakin</b> <i>Civil Engineering</i>	clakin@iit.edu	GIS experience, knowledge of building practices, writing skills, and real world work experience	Energy auditing skills, knowledge of energy efficiency practices, team building skills	Would like to present what is possible in energy efficient housing design and restorations through effective, representative case studies.
<b>Seunggeun Lee</b> <i>Electrical Engineering</i>	slee34@iit.edu [REDACTED]	Knowledgeable in electrical design and various programming languages including C, Java, and Matlab.	Would like to work on developing my communication skills.	Experience working in a large scale project.
<b>Suk-Hyun Lim</b> <i>Electrical Engineering</i>	slim10@iit.edu [REDACTED]	Knowledge of electrical housing components, Creating presentations	Would like to develop English speaking skills and improve ability to communicate ideas.	Expect to use skills gained from my electrical engineering background to help with the project.
<b>Michael Moceri</b> <i>Architecture</i>	mmoceri@iit.edu [REDACTED]	Good at Design, Presentation preparation, Problem solving, Adobe suite, AutoCAD, 3ds, Revit,	Develop better communication as a team member. Ability to sell an idea to a client.	Increase exposure to affordable home energy improvements. Reach a greater ability to communicate.
<b>Aurash Mohaimani</b> <i>Molecular Biochemistry &amp; Biophysics</i>	amohaima@iit.edu [REDACTED]	Statistics, Website building, and hard worker	Develop skills in case study design, energy audits, and team oriented website development.	Create a working version of an interactive website to educate the residents of Oak Park.
<b>Michael Muyco</b> <i>Architectural Engineering</i>	mmuyco@iit.edu [REDACTED]	Major is Architectural engineering with a focus on energy building sciences.	Work on being an effective leader.	Gain real world experience with performing energy audits on buildings and designing improvements.
<b>Minah Park</b> <i>Architecture</i>	mpark16@iit.edu	Strong skills in Photoshop, AutoCAD, and PowerPoint	Work on building better communication skills.	To learn about sustainable buildings and how to work with companies.

## Team Purpose

The overall purpose of the IPRO 329 team is to work with the Village of Oak Park in order to implement a strategic plan to educate Oak Park residents in making their homes more efficient and work toward a community wide reduction of energy and water usage. In doing so, we also hope to gain valuable experience in working in a team with members with varying degrees of experience and skills.

## Team Objectives

- Evaluate Oak Park's residential and commercial building through use of energy audits and surveys to determine current problem areas.
- Compile a list of affordable and easy retrofits that Oak Park residents can perform to make their homes or businesses more energy efficient.
- Work with the Village of Oak Park to educate its residents to implement the retrofits in order to reduce Oak Park's current energy and water usage by at least 20%.
- Work together effectively as a cohesive team in able to perform the tasks needed to accomplish the results listed above.
- Meet or exceed the expectation of the Village of Oak Park.

## II. Background

### History

The Village of Oak Park is a suburb located on the west side of Chicago that prides itself in being the former home of world renowned architect Frank Lloyd Wright and Nobel Prize winning author Ernest Hemingway. Recently, Oak Park has taken steps to establish itself regionally as a leader in environmental initiatives. However, Oak Park's historic homes and antique architecture, one of its greatest prides, threatens to make the implementation of these environmental initiatives difficult.

Currently, over eighty percent of the residential homes in Oak Park date to over ninety-five years of age, with many of them not having any major renovation done since the 1980's. The age of the homes means that many of the homes are not up to date with modern day standards. Oak Park would therefore like to create a long term community financing and education program for its residents which they hope will lead to a twenty percent decrease in energy usage and carbon outputs.

### Historical Successes

There are a number of communities in the country that have implemented programs similar to what Oak Park has envisioned. In fact, one of the possible funding sources that the village has in mind for assisting their residents is patterned directly on a financing plan called PACE, or the Property Assessed Clean Energy loan, which a few communities and states have already implemented. There are

many communities that the IPRO can use as case studies which have successfully launched energy reduction campaigns.

## Ethical Issues

IPRO 329 has the potential to encounter at least two ethical issues. These issues will be discussed as a group so that all group members are aware of the issues and how to handle each. IPRO 329 is researching energy efficiency in individual homes in Oak Park, Illinois. In order to better understand each home's energy consumption, we are asking residents to fill out a survey. Each survey may include estimated monthly payment and type of appliances among other things. We will be receiving personal information from each responding home. Personal privacy is an increasingly important issue in today's society and IPRO 329 must treat this information in an extremely ethical way. In addition to surveys, the class will rely on implementing energy audits of individual homes. Students from IPRO 329 may enter homes to conduct these audits. Students need to be respectful of personal privacy and act in an ethical and professional manner when they enter the homes. At the current point, these two ethical issues are the first to arise and will play a large role throughout the course of this semester. It is this IPRO's intent to discuss all issues as they arise and when all group members are present.

## Business and Societal Costs

IPRO 329 is fortunate to be able to work with a real client, the Village of Oak Park. This will allow students to realize the actual costs of the decisions we are making throughout the semester. Homeowners will have to fund any improvements that they wish to make to their homes. If they wish for an auditor to analyze their home, it will be an additional cost. However, IPRO 329 is working closely with Oak Park to educate their residents in energy efficiency. The information that IPRO 329 will be able to provide will aid homeowners in making decisions on which upgrades to spend their money on and what type of benefits they will see. IPRO 329 will be able to provide select homeowners with audits at no charge. These audits will be backed by IIT or a private source and will provide IPRO 329 participants valuable information. In addition to monetary costs, there will be some social costs as well. The IPRO will spend a large amount of time working with auditors and energy companies to provide the Oak Park residents with the best possible knowledge. IPRO 329 students are expected to visit Oak Park to understand the community and to witness audits. Members of the group will compile research attained through audits, interviews, and data to provide the residents of Oak Park with the best possible recommendations to reduce their energy consumption and improve the quality of life for town residents.

### III. Team Values Statement

As a team, IPRO 329 would like to treat the Village of Oak Park with respect and as a valued client. In doing this we will strive to meet deadlines set by the client and exceed their expectations for this semester's IPRO group. We will also strive to treat each team member as a valuable asset and respect their ideas, contributions, and skills. Every team member will come on time for team meetings prepared and ready to work toward the objectives set for the project.

If problems do arise during the course of this project, we will deal with it as a team. We will address the issues upfront, rather than allow them to go ignored. If the problems are the cause of an individual team member, the team will deal with the problem with respect to the team member and in a civil manner.

### IV. Work Breakdown Structure

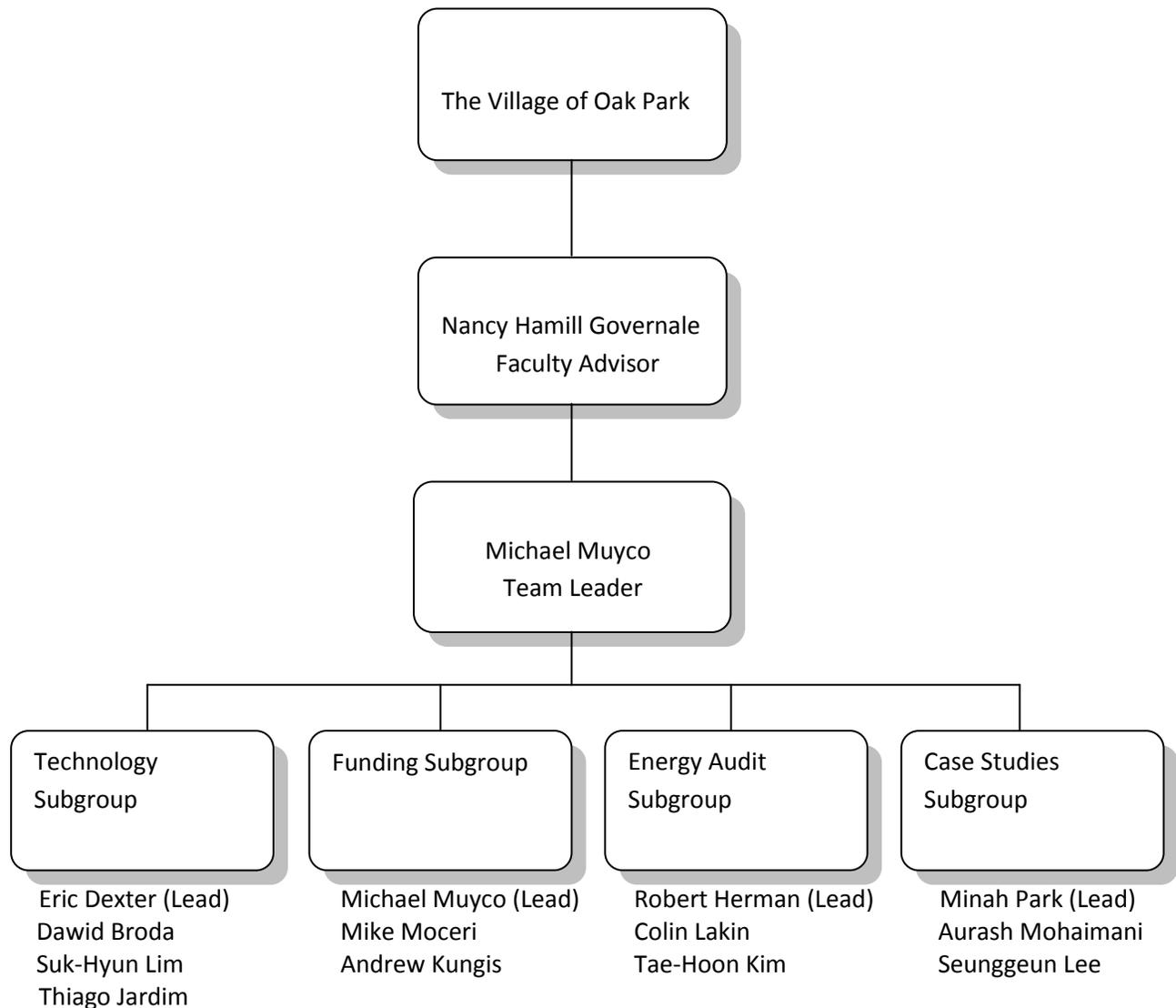
#### Problem Solving Process

The IPRO 329 team has decided to divide our semester into two phases. Due to being a fairly new IPRO project with only a summer semester project coming before us, we have agreed as a team that additional research still needs to be done in order to best design our strategy. Therefore, the first phase of our project will be dedicated to research and establishing a database of all the homes and commercial buildings in Oak Park. From there we plan to move to our Implementation phase where we will use the data gathered in our Research phase to design a strategic plan to reduce the Oak Park resident's energy usage.

Once a strategy has been devised according to the data gathered, we plan to work with the Village of Oak Park to implement our energy efficiency retrofits into a few case study homes. We will then perform blower door energy audits to these homes to determine how much improvement was made and monitor the homes' energy and water bills for months afterwards. While we will not be able to monitor these homes during our semester, we hope to have enough work done for upcoming IPRO teams to build upon.

## Team Structure

Due to the multifaceted nature of this project, the IPRO 329 team will be initially broken down into four research subgroups. These four subgroups will research topics pertaining to the overall objective of this project and will be overseen by the team leader who is also part of a research subgroup. Once the group feels like it has accumulated sufficient research, we will move from the research phase to the implementation phase and restructure ourselves accordingly.



## Gantt Chart

Task	Start	Finish	September 2010					October 2010				November 2010				Dec 2010	
			8/31	9/7	9/14	9/21	9/28	10/5	10/12	10/19	10/26	11/2	11/9	11/16	11/23	11/30	12/7
Project Plan	Friday 9/3/2010	Friday 9/10/10															
Midterm Review Presentation	Tuesday 9/14/10	Wednesday 10/13/10															
Final Project Report (Draft)	Tuesday 10/19/10	Thursday 11/18/10															
IPRO Day Abstract, Brochure, & Poster	Monday 11/22/10	Monday 11/29/10															
IPRO Day Presentation	Monday 11/22/10	Thursday 12/2/10															
IPRO Final Project Report	Monday 11/22/10	Monday 12/6/10															
First Meeting With Oak Park	Thursday 9/2/10	Thursday 9/2/10															
Tour of Oak Park	Saturday 9/11/10	Saturday 9/18/10															
Create Database of Oak Park Homes	Tuesday 9/7/10	Thursday 9/23/10															
Analyze Data and Create Case Studies	Thursday 9/23/10	Tuesday 9/28/10															
Finalize Funding Research	Tuesday 8/31/10	Tuesday 10/21/10															
Finalize Technology Research	Tuesday 8/31/10	Tuesday 10/21/10															
Perform Energy Audits on Case Study Homes	Tuesday 10/12/10	Tuesday 11/30/10															
Develop Energy Strategy for Case Study Homes	Tuesday 10/19/10	Tuesday 11/2/10															
Develop Website	Tuesday 11/2/10	Tuesday 11/30/10															
Create Instructional Media for Residents	Tuesday 11/2/10	Tuesday 11/30/10															

## V. Expected Results

The expected results according to Oak Park's requests and the team's objectives can be found below.

- A database of all homes in Oak Park detailing the building's age, construction type, and squared footage.
- A list of different case study categories the homes in Oak Park can be divided to.
- Energy audit reports on different homes that fit each individual case study category.
- An organized report detailing solutions that can be used to make each home category more energy efficient.
- A strategic plan to educate the residents of Oak Park on these energy efficiency solutions.

## VI. Budget

Activity	Cost	Description
<b>Transportation</b>	\$100	Cost of 10 Round Trips to the Village of Oak Park to visit homes, perform audits, and present results to the Village assuming a 24 mile round trip using 2 cars at \$0.20/gallon
<b>Energy Audits</b>	\$5,400*	Cost of 9 Professional Energy Audits of case study homes at an estimate of \$600 per audit. *While we will be trying to find other sources of funding from the village, we would like to cover part of the costs.
<b>Printing Supplies</b>	\$60	Costs for printing brochures and posters for IPRO day.
<b>Lunches with Clients</b>	\$300	Cost of having 2-3 lunch meetings with the client and representatives from Oak Park.
<b>Total</b>	\$5860	

## VII. Designation of Roles

iGroups Moderator: Dawid Broda will be responsible for organizing the files and links uploaded to the IPRO's iGroups page and ensuring all deliverables get posted on time. He will also keep track of any important communications with the IPRO Office.

Agenda Maker: The team leader will assume the responsibilities of the agenda maker since he will be mainly in charge of establishing what work needs to be done and when.

Time Keeper: Tae-Hoon Kim will be responsible for ensuring that meetings go according to the agenda.

Minute Taker: Eric Dexter will be responsible for preparing and uploading minutes from the biweekly team meetings as well as any meetings with Oak Park or energy auditors.

Subgroup Leaders: The subgroups leaders are listed above in the Team Structure section. They are expected to report their subgroups progress to the team leader, Michael Muyco.