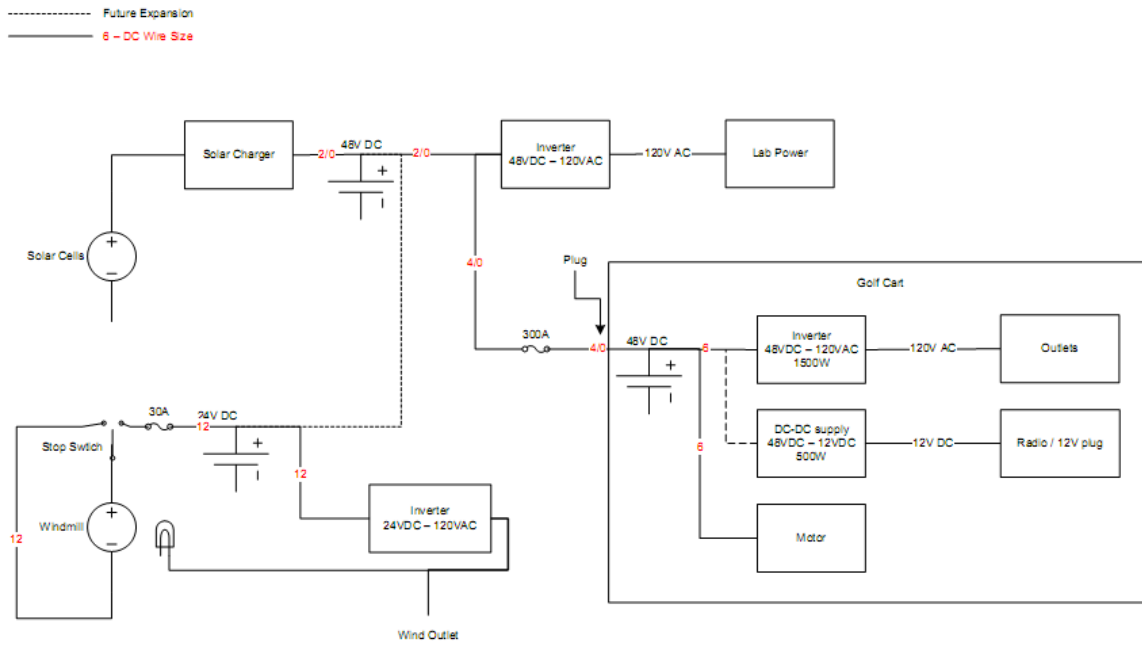


# IPRO-337



Electrical System Diagram



The IPRO-337 Team

## IPRO-337

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I PRO-337

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Our IPRO is about establishing an off grid-laboratory utilizing renewable energy sources for scientific research and experimentation. The Zero Energy Lab is located on the fourth floor of Machinery Hall on the main campus of the Illinois Institute of Technology.



Our goal was to incorporate an additional energy source into the existing solar system, add capacity to the battery systems using the mobile energy cart. The mobile energy cart would then be able to supply power throughout the lab. Also a new design layout for the space was needed to be formulated and its beginnings implemented.

## Wind Turbine

A new wind turbine was obtained and tested in the field south of Galvin Library. Wind tests were initially performed on top of machinery hall. These wind tests provided some data on how the windmill would operate in the Chicago Wind conditions. The additional tests were preformed to get more accurate data with our specific wind turbine.



## Mobile Energy Station

The mobile energy station is a modified 48 Volt golf cart that is used for an additional battery bank in the lab. The mobile energy station is a portable battery bank that can be used anywhere in the laboratory. It can be used as an additional lab area, and will eventually be integrated with a projector to allow for a mobile presentation center.

## Lab Space Design

The lab space is redesigned to be a more effective and useful of a space. This has been done by creating a new desk unit that can easily be broken apart and stored in the corner of the lab. Each of the desks are capable of connecting to an electrical outlet providing an easy power flow to the desk and any electrical appliances connected to the desk.



## Electrical System

A new electrical system has begun being implemented in the lab space. It will integrate the mobile energy station, the exist-

ing solar system, and the wind system.



The system has several checks and balances to ensure no over loading or any system faults. It provides an adequate power flow to all appliances in the lab, and will allow

for easy charging on the mobile energy station.

## Solar System

There is an existing solar system in the lab, which provides all of the power to the lab presently. It provides ample power for several battery banks the size of the existing bank. The mobile energy station provides additional power storage for the laboratory. This new bank will greatly expand the solar system's power storage to a level that the lab will be useable for a larger grouping of people.

