Goals:

1. To design a smart module able to integrate electric powered devices to Unified Power over Ethernet (UPoE) networks driven by Cisco switches and remotely managed by Cisco EnergyWise web application;
2. To acquire expertise in developing UPoE-capable hardwares and firmwares;
3. To devise an UPoE network architecture based on programmable mechanisms that facilitate the conversion of regular appliances to UPoE-powered devices (PDs) and their integration to Cisco UPoE environment;
4. To build an API that allows third-party applications to communicate easily and seamlessly to UPoE networks through Cisco EnergyWise software;
5. To conceive a methodology for testing, verification and standardization of hardwares, firmwares and applications designed to work within Cisco UPoE networks environment.
6. To train UBC IT and ECE staff to install and operate Cisco UPoE networks, as well as develop equipment and applications capable of taking advantage of the high level of control, flexibility and versatility of UPoE technology.

Resources:

1. Cisco switch (model ???);
2. Blue Star 40W LED with 0-10V dimming capabilities;
3. 2 computer labs;
4. 2 undergraduate project labs;
5. $300 budget;
6. 3 UBC undergraduate students;

Requirements:

1. CISCO Switch emulator;
2. CISCO PoE powered device;
3. CISCO support for PoE;
4. CISCO support for EnergyWise ;

Constraints:

1. Time constraint: project should be ready by August 15th;
2. $300 budget;

Deliverables:

1. Demo 1: Blue Star 40W LED light with full dimming capabilities powered by an Ethernet cable.
2. Demo 2: Blue Star 40W LED light with full dimming capabilities integrated to a safe, isolated UPoE network controlled by CISCO EnergyWise application.
3. Demo 3:
4. Final:
   1. Blue Star LED UPoE to EnergyWise module;
   2. EnergyWise API for third-party applications;
   3. Device to control non-native PoE PDs (Raspberry Pi? Arduino?);
   4. Web knowledge base with UPoE networking documentation;

Milestones:

1. Regular operation of Blue Star LED light;
2. PoE power switch for Blue Star LED light;
3. EnergyWise remote control over Blue Star LED light;
4. PoE subnetwork successfully operating over Cisco environment;
5. Multiplatform desktop (Linux/OSX/Windows) application connected to CISCO EnergyWise to monitor energy consumption and usage patterns;