California State University
DOMINGUEZ HILLS

DOE
Connected Lighting Workshop

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Kenneth Seeton

kseeton@csudh.edu

Why I took the risk of being an early adopter

- Worst case scenario is new lights work same as old but use less wattage.

- The potential for savings far outweighed the risks.

- Someone has to be willing to take a risk in order to help push the market into the future.
  - What better place than a college university (Cal State University Dominguez Hills) to help push us into the future?

Why control every fixture?

- No matter the code changes (Title 24), we can adapt
- Take full advantage of future software updates
- Better daylight harvesting
- Easily adjustable lighting scenes

What features are important to me today?

- HVAC optimization
- Space utilization
- Classroom scenes
- Plug loads
- Proven energy saving reports

- Need an easy restore mode.

What do I see in the future?

- Professor walks into room and lights and HVAC adjust to his or her preselected levels.
- Maintenance walks into the room and they are immediately connected to a database that corresponds to relevant room data.
  - Age of carpet, paint, furniture, etc.
  - Last time cleaning was done or floor polishing.
  - PMs or work logs.
- CO_2 sensors, humidity, water leaks/flooding detection.

What do I see in the future?

- Security to keep track of equipment and or people.
- Help to locate people in case of a disaster or lock down.
- Communication via speech and cameras.
- Controlling outside air economizers and discharge air set points based on not only temperature, but also lumen levels measured at outdoor lights.
- kWh sensors for larger loads i.e. pumps & fans.

Things I have learned:

- People know they are saving energy when the lights shift up and down as they walk by.

- How easy it can be to gain control of HVAC at a much more granular level.

- How easy it is to make people happy by talking to them in person and adjusting their light levels to exactly how they want it.
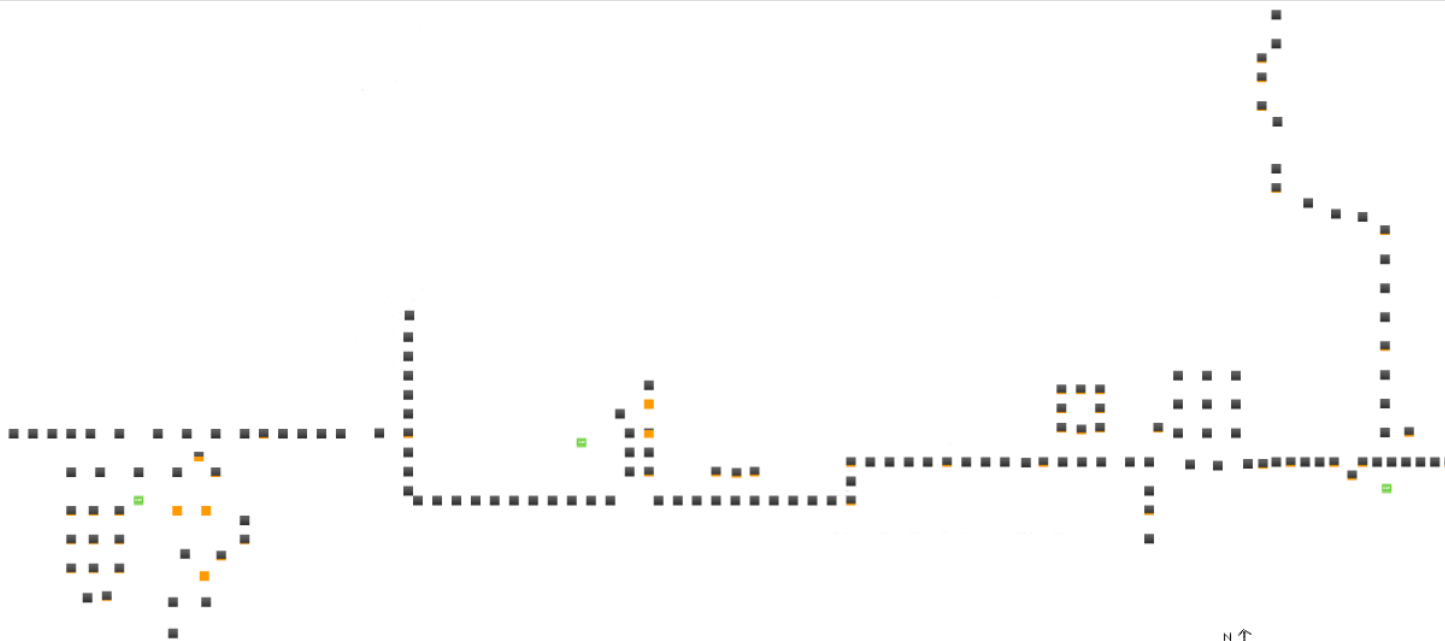
- Include I.T. from the beginning or sooner.

Before 100%

After 25%

Quotes

- "I feel safe in areas that were always a bit scary." (Faculty person)

- "It is just **cool**, with the lights going up and down as you walk by." (I.T. Director)

- "Finally we can adjust the lights to how we think they're best and not how the electrician thought they should be." (Faculty)

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enlighted Connexus
WELCOME admin

🏛 Facilities | ⚖ Administration | 📋 Reports | ◯ Help | ⟲ Logout

v 3.5.1.7413 Current Server Time: 2016-05-23 11:24 PDT

| Energy Consumption | Floor Plan | Devices | Settings | Events |

View: Light Level ▾ **Find:** ▾ **Override Light Level:** OFF -99 ⸺●⸺ 99 ON Auto Light Level

Save as PDF

»

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– Zoom +

─●────

☑ Lock Drag Drop

☐ Show Grid

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Snap To Grid

Select All

N ↑
TUNNEL LAY OUT

EULA | Contact Us
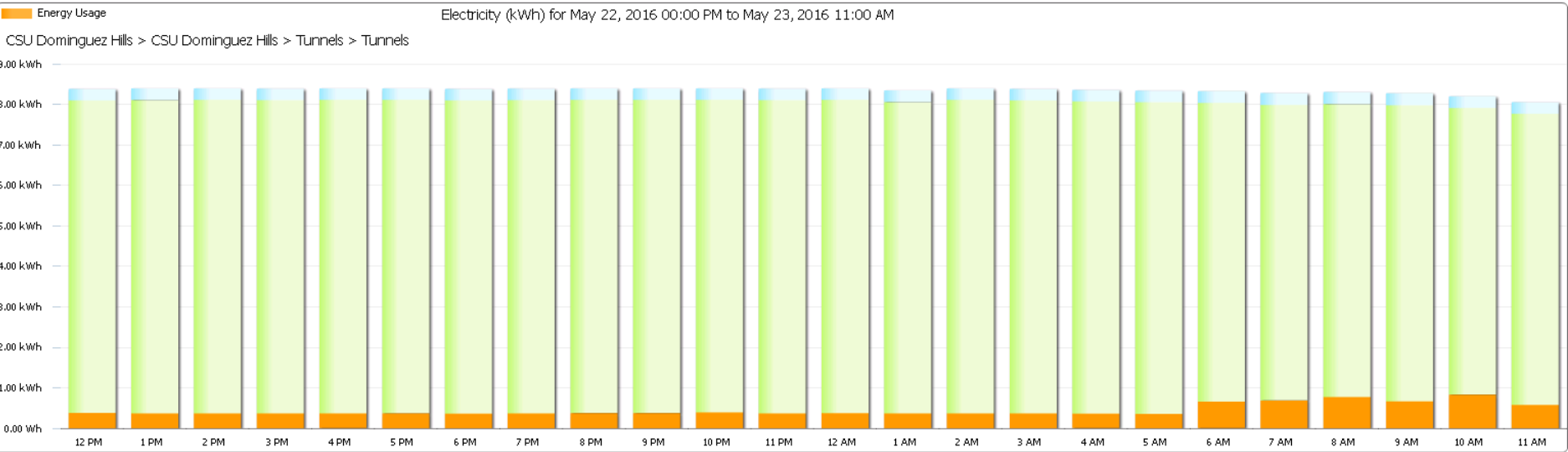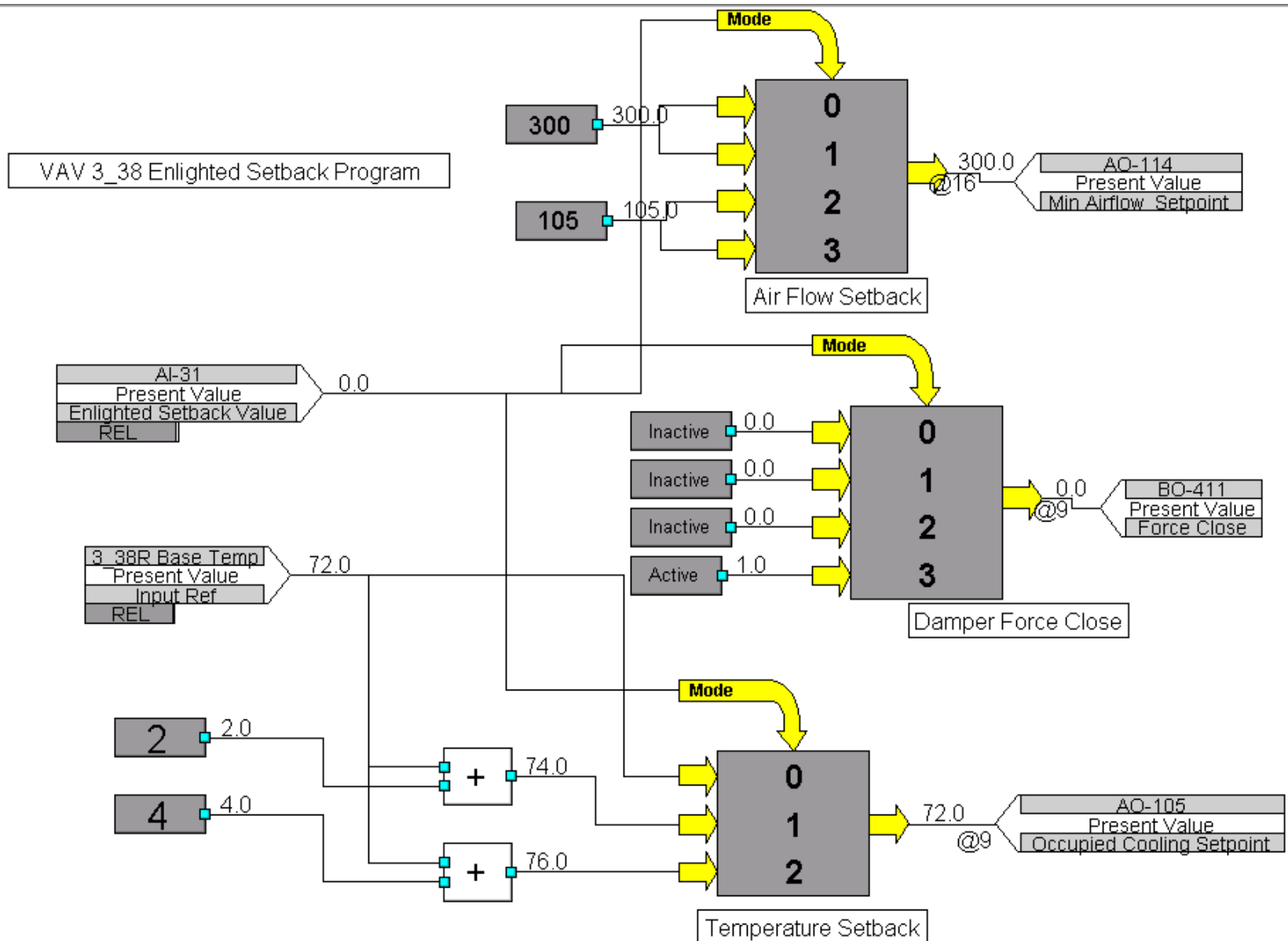
During <u>February</u> 2015, EcoVox building analytics showed that the 15 VAV units with Enlighted occupancy controls averaged 152 hours each with flow reduced by 161 cfm from normal. This accounts for **a 2.1% reduction** of the total airflow through air handlers 2 and 3, **saving 720 kWh**. There was also a savings of approximately **80 therms** of natural gas, due to cooling saved at the chiller level.

Welch Hall has a total of 185 VAV units.

185 / 15 = 12.33
720kWh * 12.33 = 8,878 kWh * 12 months = 106,531 kWh per year
80 therms * 12.33 = 986 therms * 12 months = 11,837 therms per year

ECOVOX
ENERGY ANALYTICS

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Facilities | Administration | Reports

v 3.5.1.7413 Current Server

| Energy Consumption | Floor Plan | Devices | Settings | Events |

View: Light Level   Find: [   ]   Override Light Level: OFF -99 ——○—— 99 ON Auto Light Level

2101 2103 2105 2107

2102 2104 2106

| Off 0 W | Dark | Occupied 3 days, 19 hrs ago | Normal 70.8 F |

Sensor015707 - Lab SAC_2 - Auto

Area - classrooms only

Start

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Facilities   Administration   Reports   Help   Logout

v 3.5.1.7413 Current Server Time: 2016-05-23 14:56 PDT
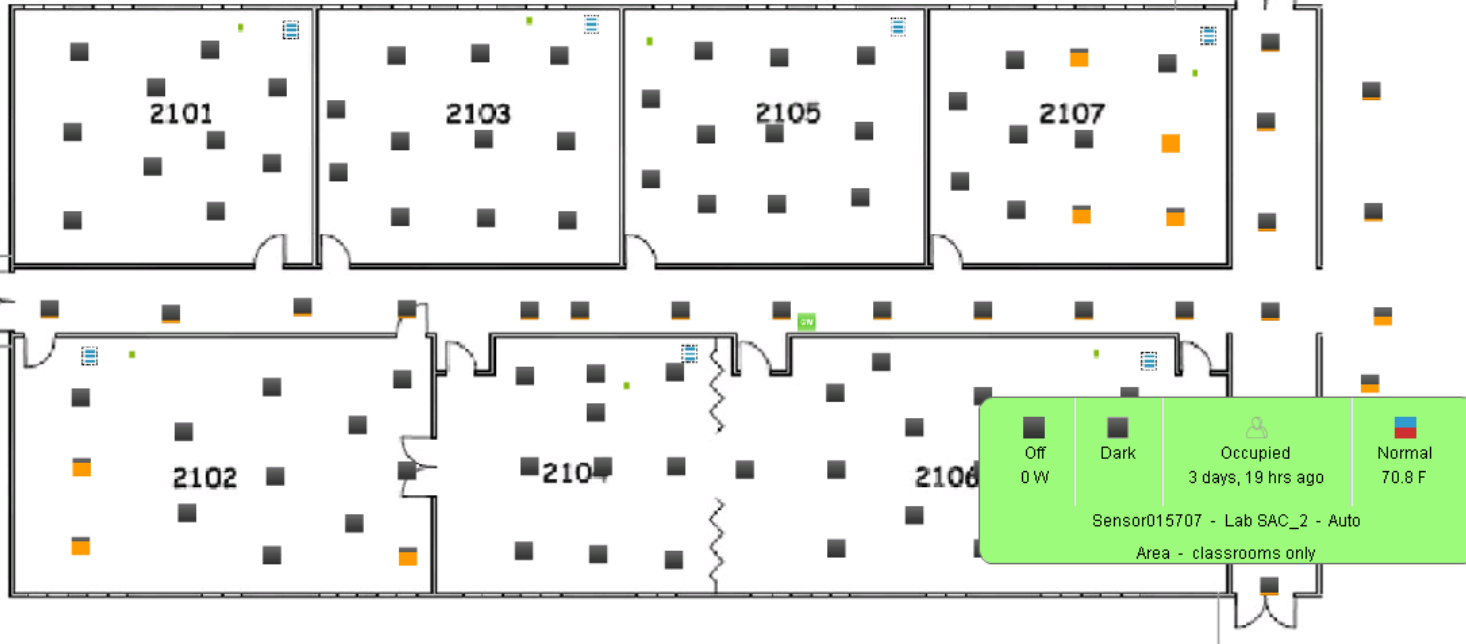
| Profile Templates |
| Plugload Profile Templates |
| **Facilities** |

- CSUDH NSM
  - CSUDH
    - NSM
      - 1st Floor
      - 2nd Floor
        - Classrooms
        - Exterior
        - Interior Hallways
      - 3rd Floor

Energy Consumption | Floor Plan | Devices | Settings | Events

View : Lighting   Unit kWh   Period D W M Y   From: 05/22/2016 To: 05/23/2016   Apply   Save as PDF   Export

Period Savings

91%

Task Tuning
Daylight Harvesting
Occupancy

32.0 kWh

Current Savings

97%

Task Tuning
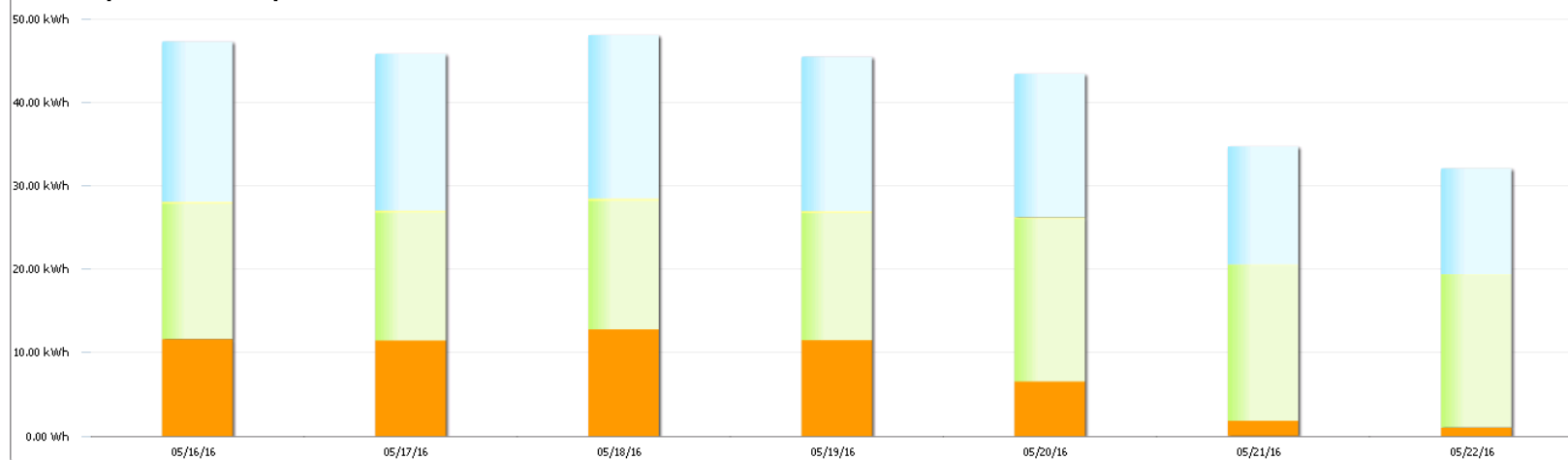Daylight Harvesting
Occupancy

Load

Current	39 W
Period Peak	243 W
Current Baseline	1.4 kW

Energy Usage   Electricity (kWh) for May 22, 2016 03:00 PM to May 23, 2016 02:00 PM

CSUDH NSM > CSUDH > NSM > 2nd Floor > Exterior
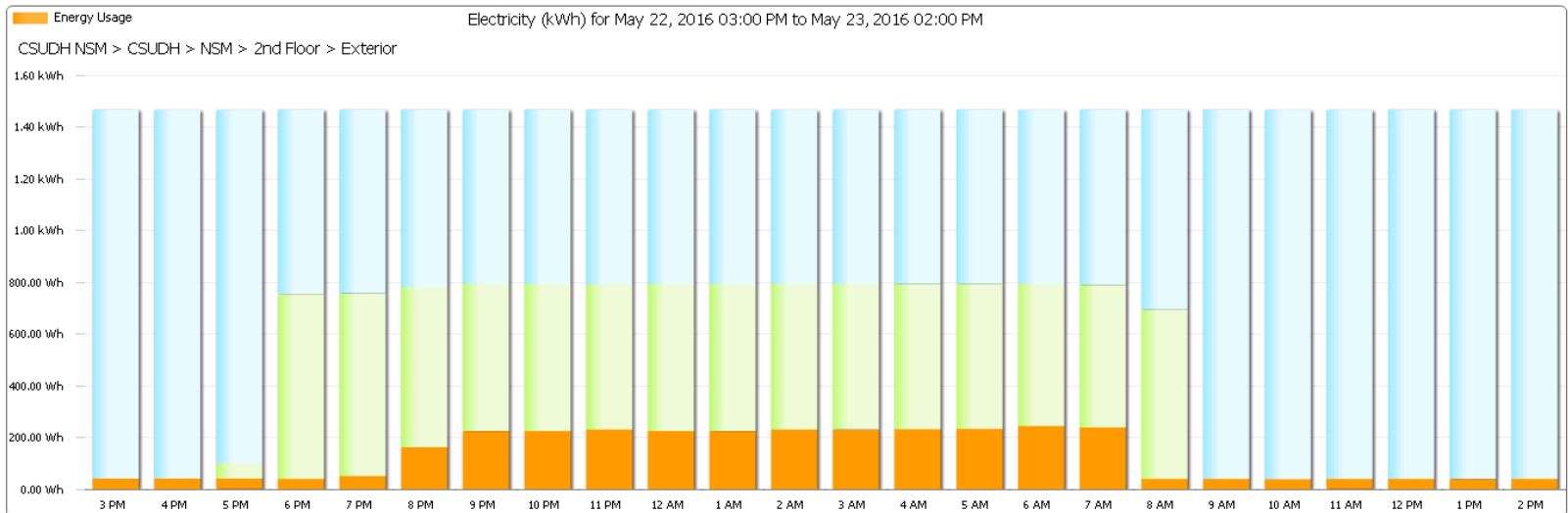
IOT

(Internet of Things)

Once the backbone or network is in, we are only limited by our imagination of how we want to expand the system.

**If Better is Possible,
Good is not Enough.**