

ENERGY 291 Project Proposal:
Optimization of house appliances demand response to minimize electricity cost
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Problem: Time of use electricity rates can double at peak hours due to a surge in demand causing a dramatic increase in electricity cost for consumers due to high consumption at on-peak electricity rates. At the same time, peak demand causes stress on the grid as demand approaches the available energy supply available in the grid. Therefore, we try to optimize controlling appliances' electricity consumption during peak hours to minimize cost and reduce demand surge on the grid.

Objective: minimize electricity cost and energy used for a residential house

Decision variable: Electricity rate threshold to turn on/off the appliance (i)

Tentative Devices/appliances:

HVAC

PV

EV Charger

Water Heater

Constraints:

Demand and supply,

Comfortness level of customer - maximum saving vs maximum comfort