

# ESRA THE ENERGY SAVING BUTLER

ESRA: Energy Saving Remote Assistant

Electrical Engineering  
Department

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# Abstract

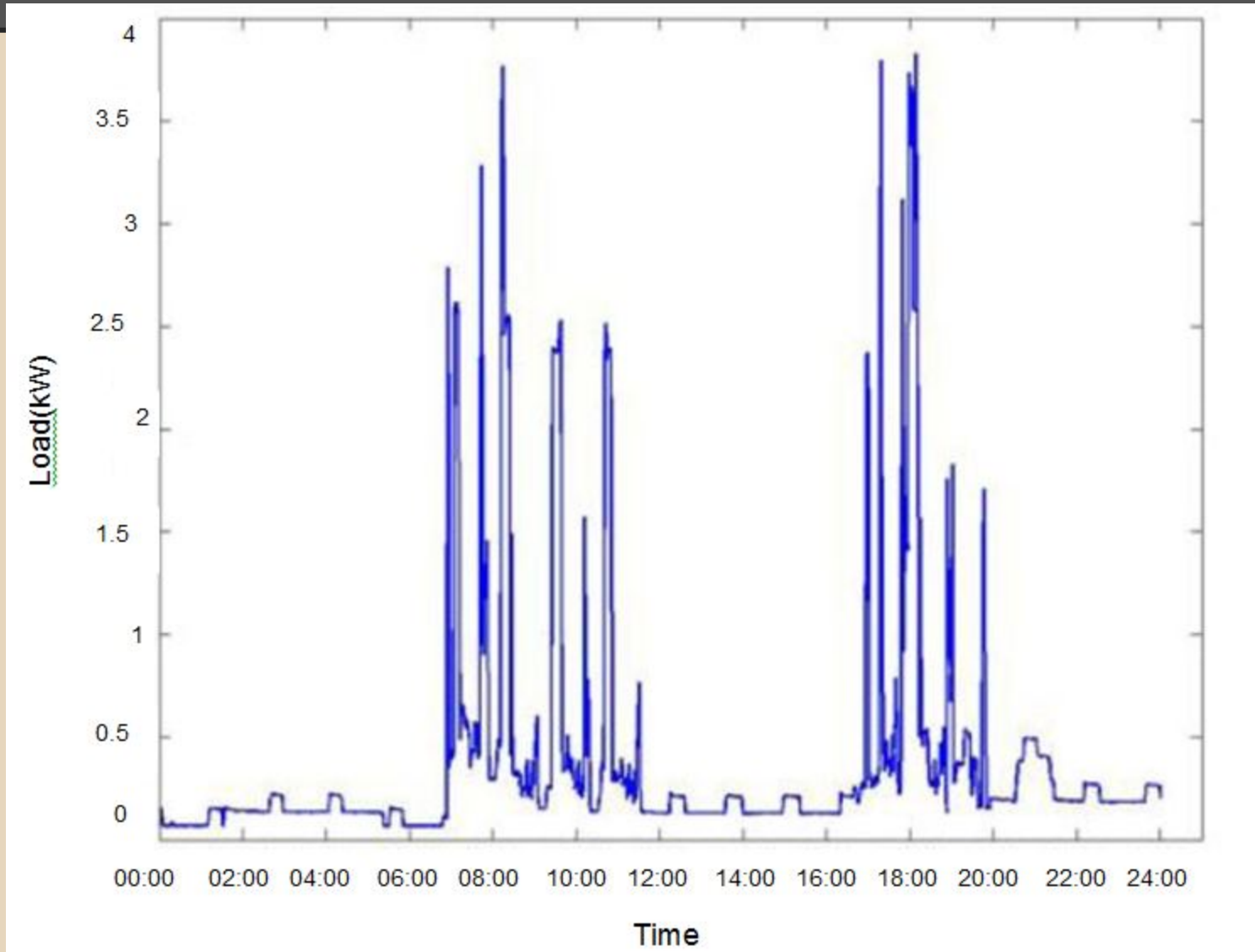
Creating individual incentive for global change

# Assumptions

- All appliances are "smart" appliances
  - wireless communication to central server
  - controllable functions
  - know how much power they are using
  - know which appliance they are (e.g. dishwasher, freezer, water heater, etc)
- ESRA fed real-time information on power rates from power companies
- Impenetrable security

# Daily Power Usage

(Preliminary Analysis of High Resolution Domestic Load Data) Zhang Ning, Daniel S Kirschen



# Installation

- ESRA monitors appliance usage for an initial two week period
- APLS (Appliance Priority Level System)
  - Based on data collected by the butler, appliances are assigned different priority levels
- Automatically registers new appliances

# Scheduling and Prioritization

- ESRA reschedules tasks based on prices received from power company
  - e.g. delaying the charge of an EV to 2 am
- Priority levels determine length of delays for each appliance
  - Fridge vs garage light
  - Washing machine vs dishwasher
- Mobile/Web-based control to reschedule the ESRA system.

# User Influence on Priority Levels

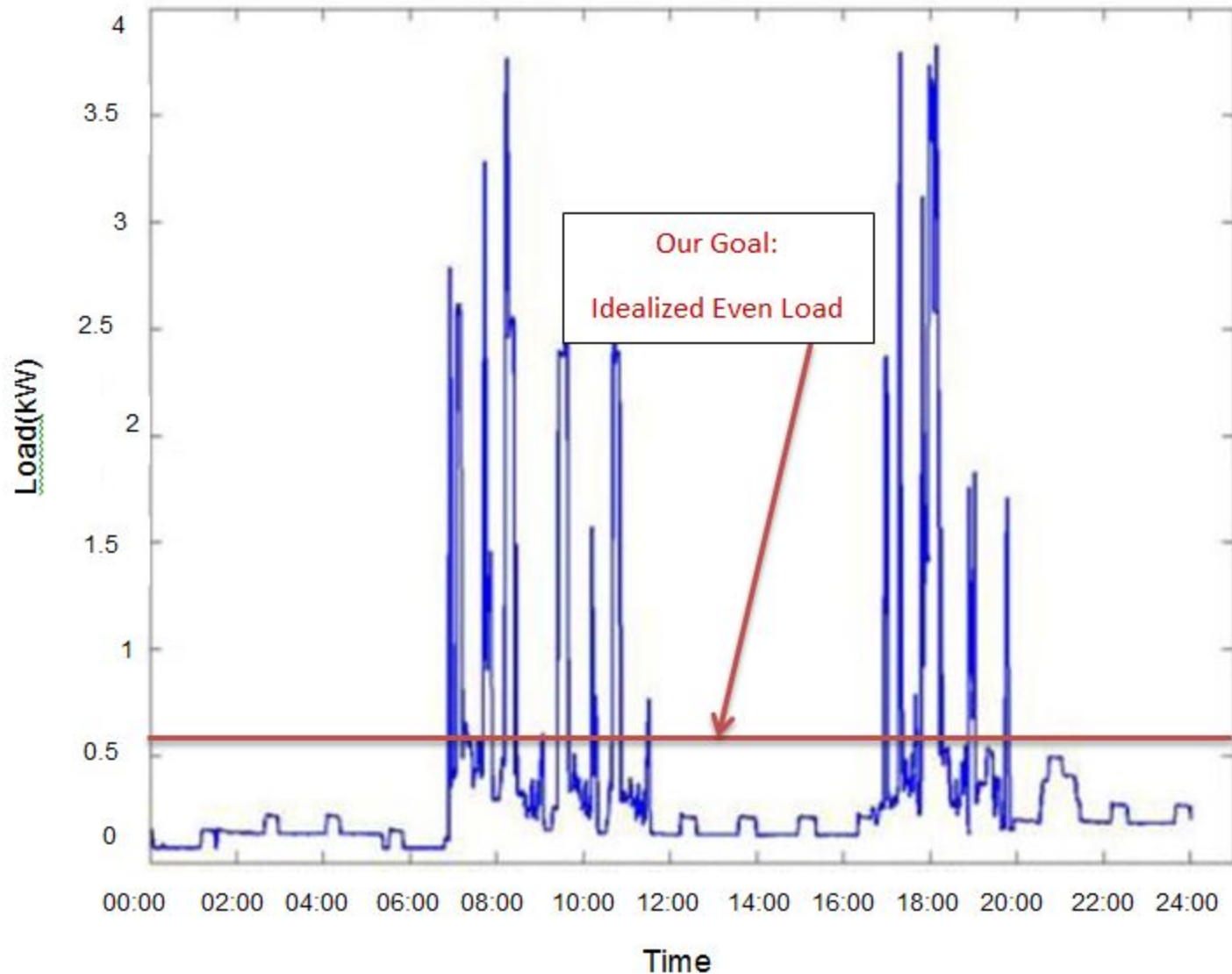
- Priority Level "0"
  - e.g. "Dishes, NOW!"
- Profiling System
  - e.g. Dinner party, vacation week
- Behavior based priority level adjustment

# Other Items to Mention

- Prioritize private power
- Reports on savings and progress on goals
- Event-based triggers
- Privacy issue



# Our Goal: Consistent Load



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