



<CityLearn  
Challenge>

**Project Report**

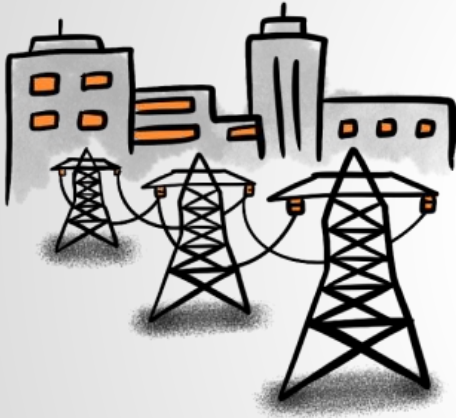
<Dec 8, 2022>

Prepared by: <Hedieh and Rauan>

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## Problem statement

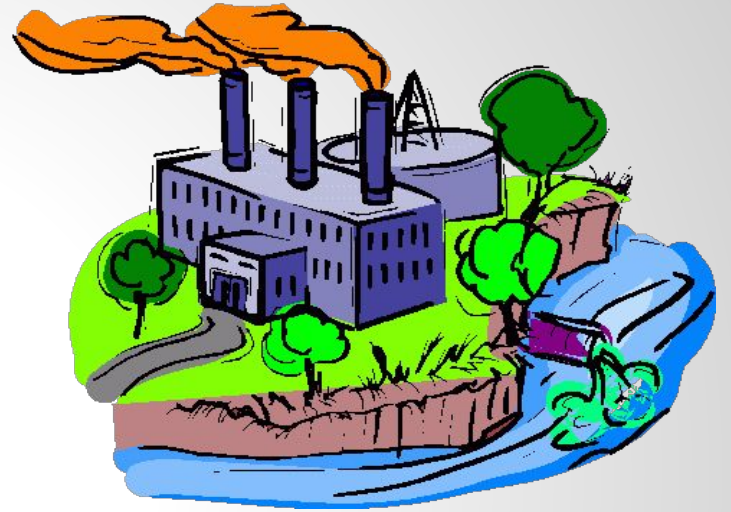
**Minimize**



**Grid load**

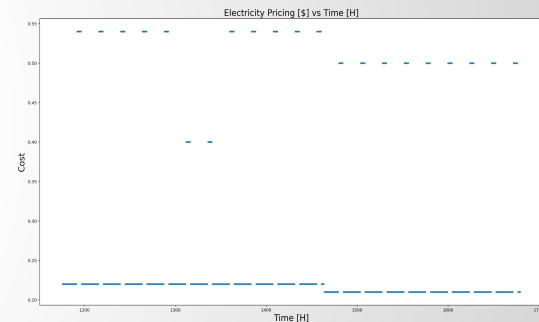
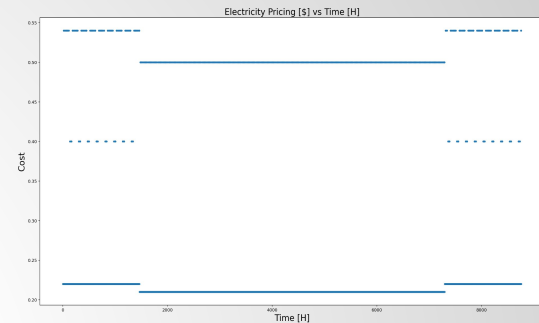
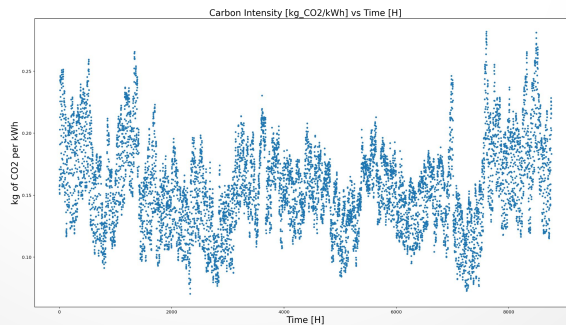
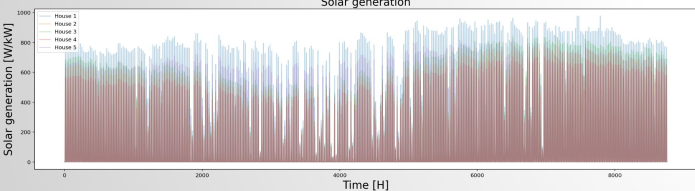
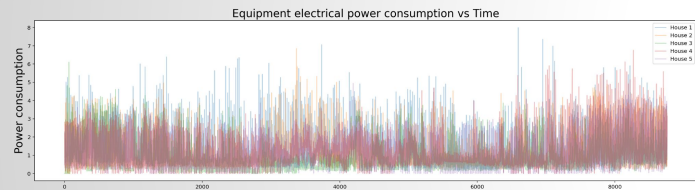
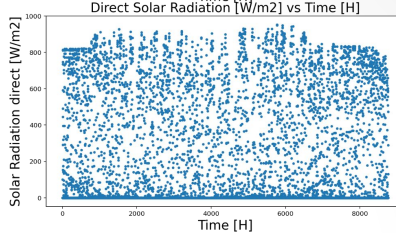
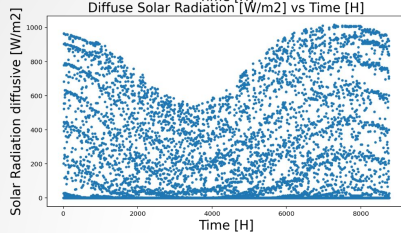
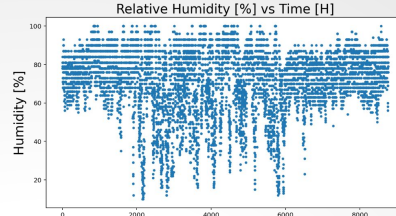
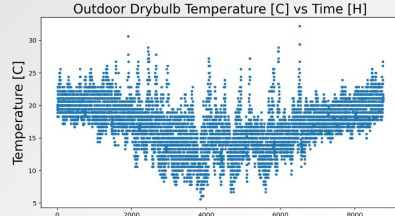


**Electricity cost**



**Emission**

# Data overview



## Weather

## Consumption/Generation of electricity

## Carbon intensity

## Electricity cost

# Reinforcement Learning

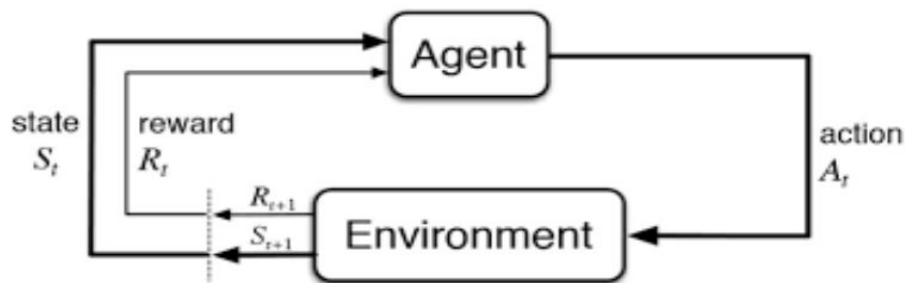


Figure 6: Sample diagram of RL approach.

- **State input**
- **Action performance**
- **Environment changes**
- **Environment rewards agent**



**Episodic vs Continuous**

**Cumulative reward**

$$G_t = \sum_{k=0}^T R_{t+k+1}$$

**Adding discount rate**

$$G_t = \sum_{k=0}^{\infty} \gamma^k R_{t+k+1} \text{ where } \gamma \in [0, 1)$$

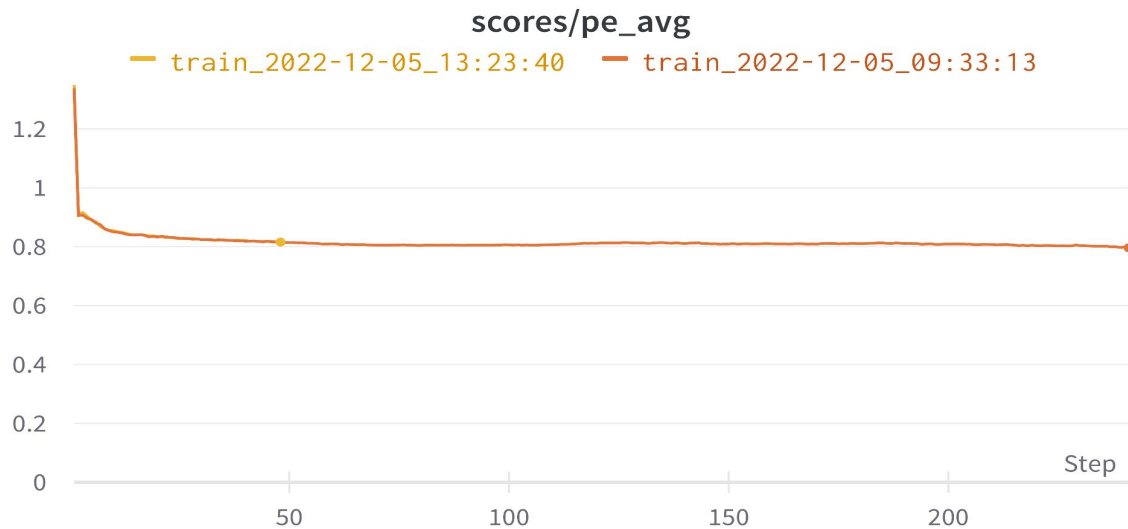


**Value**

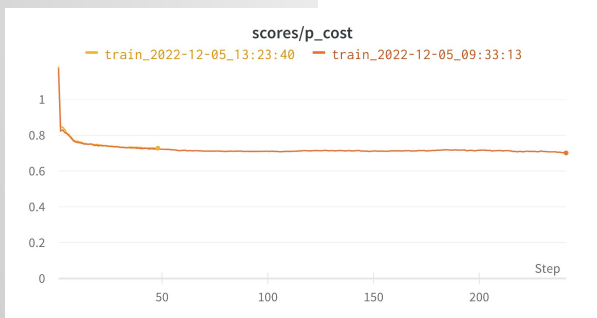


**Policy**

# Results



## Average



Price score



Emission score

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## Project Activities