```
Python 3.12.3 | packaged by conda-forge | (main, Apr 15 2024, 18:20:11) [MSC v.1938 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 8.27.0 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/faruk/OneDrive/Desktop/2024-2025 Spring/EHB474/final/final.py', wdir='C:/Users/faruk/OneDrive/Desktop/2024-2025
Spring/EHB474/final')
Example EV data:
EV 1: Arrival=10, Departure=23, Demand=10.33 kWh
EV 2: Arrival=10, Departure=16, Demand=36.24 kWh
EV 3: Arrival=3, Departure=23, Demand=16.28 kWh
EV 4: Arrival=1, Departure=8, Demand=15.22 kWh
EV 5: Arrival=12, Departure=20, Demand=14.67 kWh

Solution Status: Optimal
EV 1 Cost: $1.62
EV 2 Cost: $5.69
EV 3 Cost: $2.68
EV 4 Cost: $2.54
EV 5 Cost: $2.61

Total Cost for All EVs: $15.13

Hourly Charging Plan:
         EV_1       EV_2       EV_3       EV_4       EV_5
0    0.000000   0.000000   0.000000   0.000000   0.000000
1    0.000000   0.000000   0.000000   0.000000   0.000000
2    0.000000   0.000000   0.000000   0.000000   0.000000
3    0.000000   0.000000   0.000000   0.000000   0.000000
4    0.000000   0.000000   0.000000   0.000000   0.000000
5    0.000000   0.000000  12.856594  15.221389   0.000000
6    0.000000   0.000000   0.000000   0.000000   0.000000
7    0.000000   0.000000   0.000000   0.000000   0.000000
8    0.000000   0.000000   0.000000   0.000000   0.000000
9    0.000000   0.000000   0.000000   0.000000   0.000000
10   0.000000   0.000000   0.000000   0.000000   0.000000
11  10.331117  36.241664   3.427219   0.000000   0.000000
12   0.000000   0.000000   0.000000   0.000000   0.000000
13   0.000000   0.000000   0.000000   0.000000   0.000000
14   0.000000   0.000000   0.000000   0.000000   0.000000
15   0.000000   0.000000   0.000000   0.000000   0.000000
16   0.000000   0.000000   0.000000   0.000000  14.673273
17   0.000000   0.000000   0.000000   0.000000   0.000000
18   0.000000   0.000000   0.000000   0.000000   0.000000
19   0.000000   0.000000   0.000000   0.000000   0.000000
20   0.000000   0.000000   0.000000   0.000000   0.000000
21   0.000000   0.000000   0.000000   0.000000   0.000000
22   0.000000   0.000000   0.000000   0.000000   0.000000
23   0.000000   0.000000   0.000000   0.000000   0.000000

Naive cost per EV (no optimization):
EV 1: $2.32
EV 2: $8.39
EV 3: $3.66
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EV 4: $3.15
EV 5: $3.46

Naive total cost for all EVs: $20.97

Percentage Saving due to Optimization: 27.84%
```

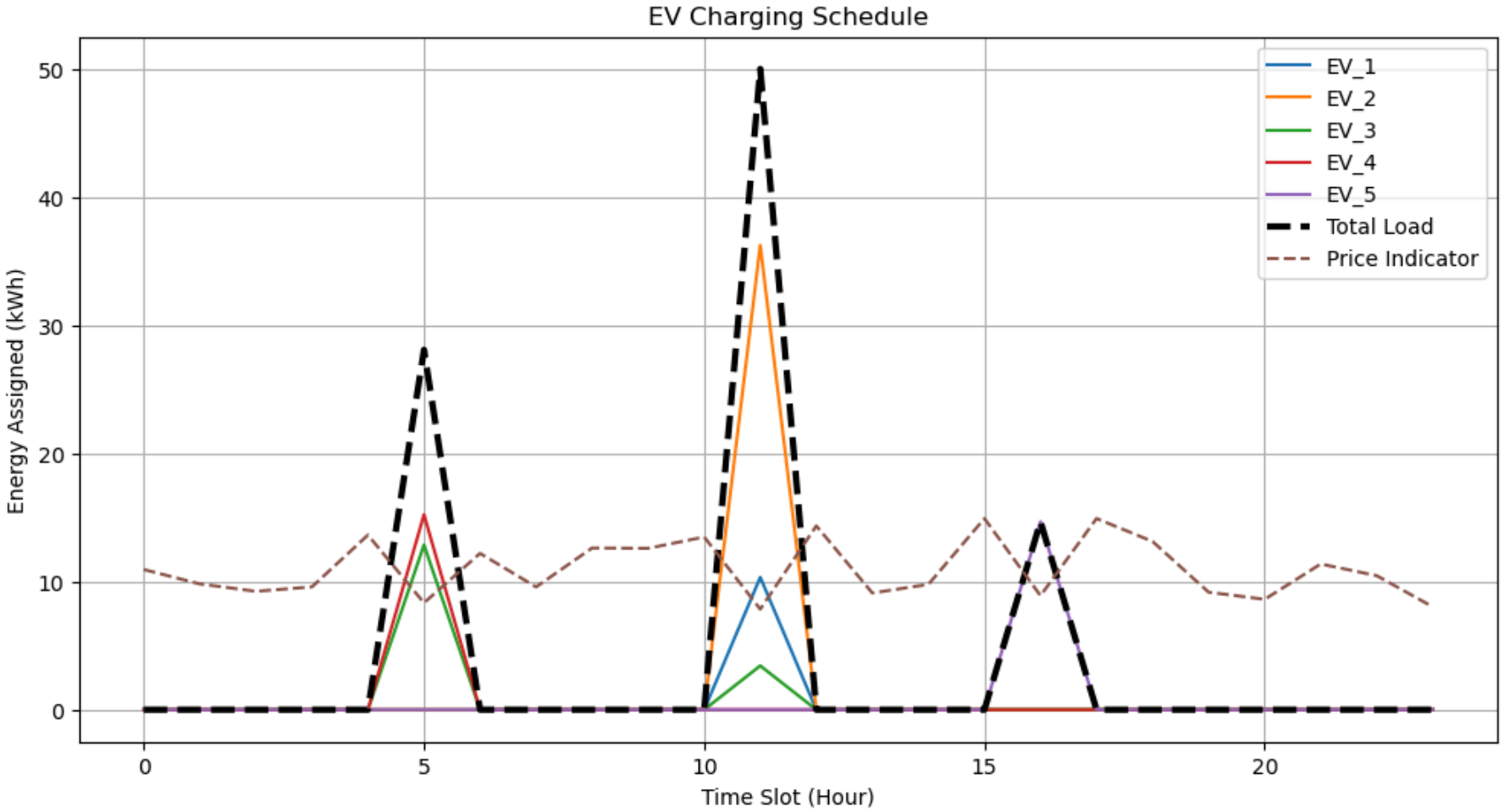

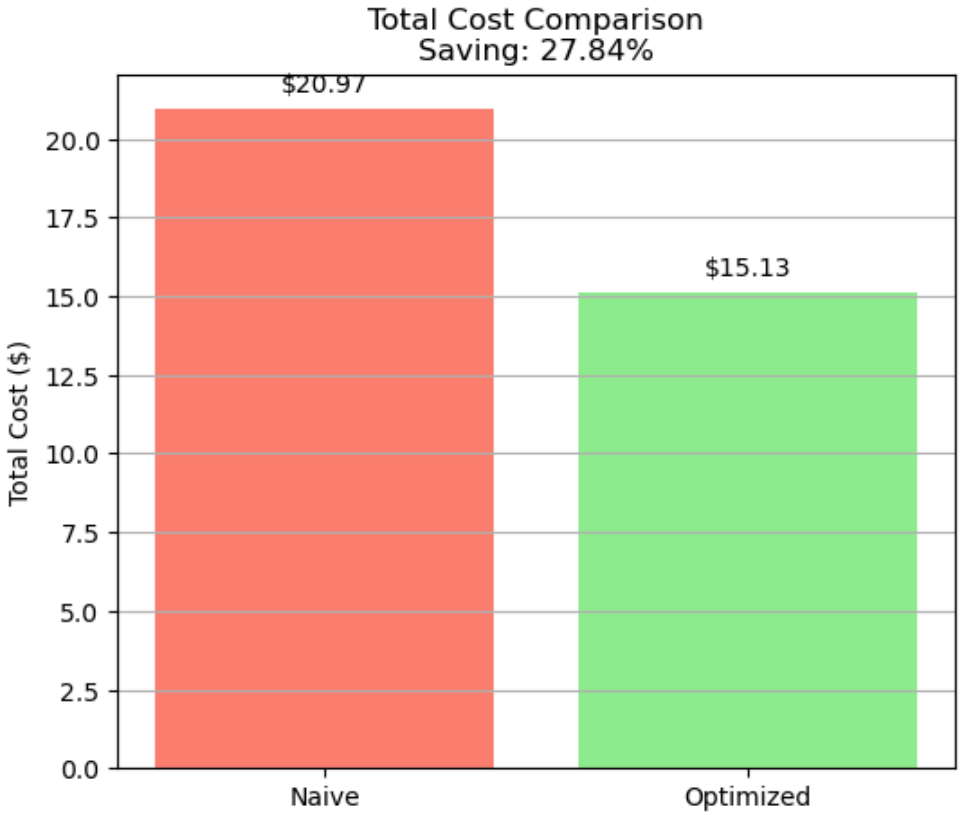


```
C:\Users\faruk\anaconda3\Lib\site-packages\debugpy\_vendored\pydevd\pydevd_plugins\__init__.py:5: UserWarning: pkg_resources is deprecated as an
API. See https://setuptools.pypa.io/en/latest/pkg_resources.html. The pkg_resources package is slated for removal as early as 2025-11-30. Refrain
from using this package or pin to Setuptools<81.
  __import__('pkg_resources').declare_namespace(__name__)

Welcome to the CBC MILP Solver
Version: 2.10.3
Build Date: Dec 15 2019

command line - C:\Users\faruk\anaconda3\Lib\site-packages\pulp\solverdir\cbc\win\64\cbc.exe
C:\Users\faruk\AppData\Local\Temp\4e6e094836d54a7e93f329801ac8ff78-pulp.mps -timeMode elapsed -branch -printingOptions all -solution
C:\Users\faruk\AppData\Local\Temp\4e6e094836d54a7e93f329801ac8ff78-pulp.sol (default strategy 1)
At line 2 NAME          MODEL
At line 3 ROWS
At line 100 COLUMNS
At line 527 RHS
At line 623 BOUNDS
At line 624 ENDATA
Problem MODEL has 95 rows, 120 columns and 306 elements
Coin0008I MODEL read with 0 errors
Option for timeMode changed from cpu to elapsed
Presolve 23 (-72) rows, 54 (-66) columns and 104 (-202) elements
```

```
0  Obj 0 Primal inf 92.75125 (5)
6  Obj 15.134286
Optimal - objective value 15.134286
After Postsolve, objective 15.134286, infeasibilities - dual 0 (0), primal 0 (0)
Optimal objective 15.13428637 - 6 iterations time 0.002, Presolve 0.00
Option for printingOptions changed from normal to all
Total time (CPU seconds):       0.01   (Wallclock seconds):       0.01
```

In [2]: