

Back to Basics: CATLOC Guided Tour

2023 Australian Opus Suite Conference

Jim Foley



CATLOC

- What is CATLOC?
- Integration with OPUS10 & SIMLOX
- Model View Features
- Result Window Features
- Demonstration: Cost Driver Identification & Cost Reduction
- Scope Options for your Project or Capability

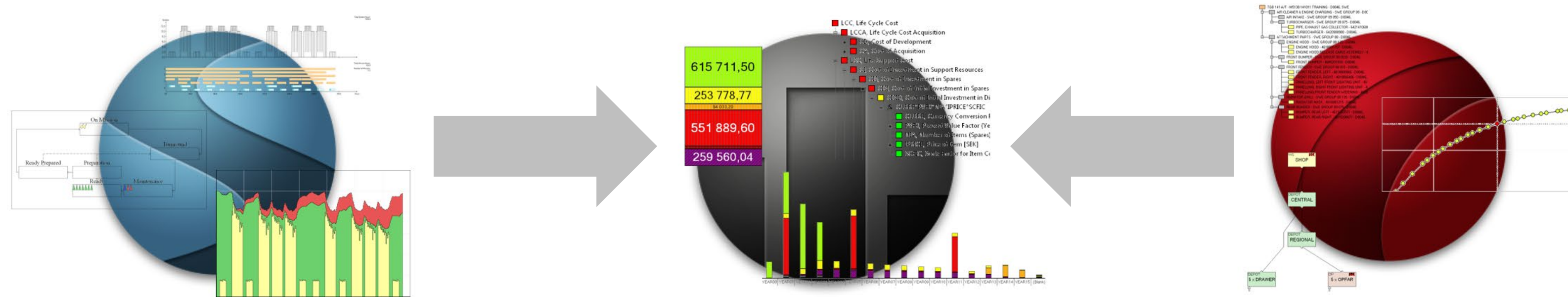
What is CATLOC?

- **Calculation and Analysis Tool for Logistics and Operational Costs**

- Calculation and Analysis Tool for Logistics and Operational Costs
- Life Cycle Cost/ Total Cost of Ownership modelling toolset

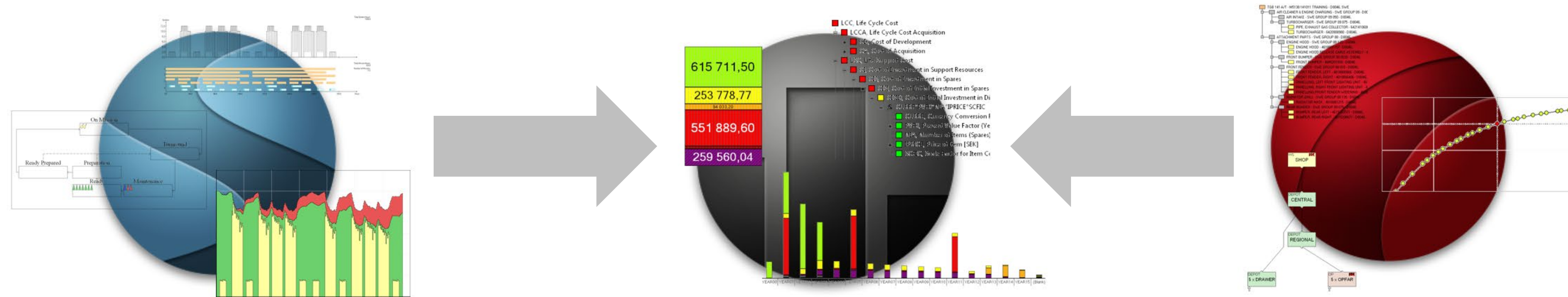
- Calculation and Analysis Tool for Logistics and Operational Costs
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- CASG approved & used by local Industry for 10+ years

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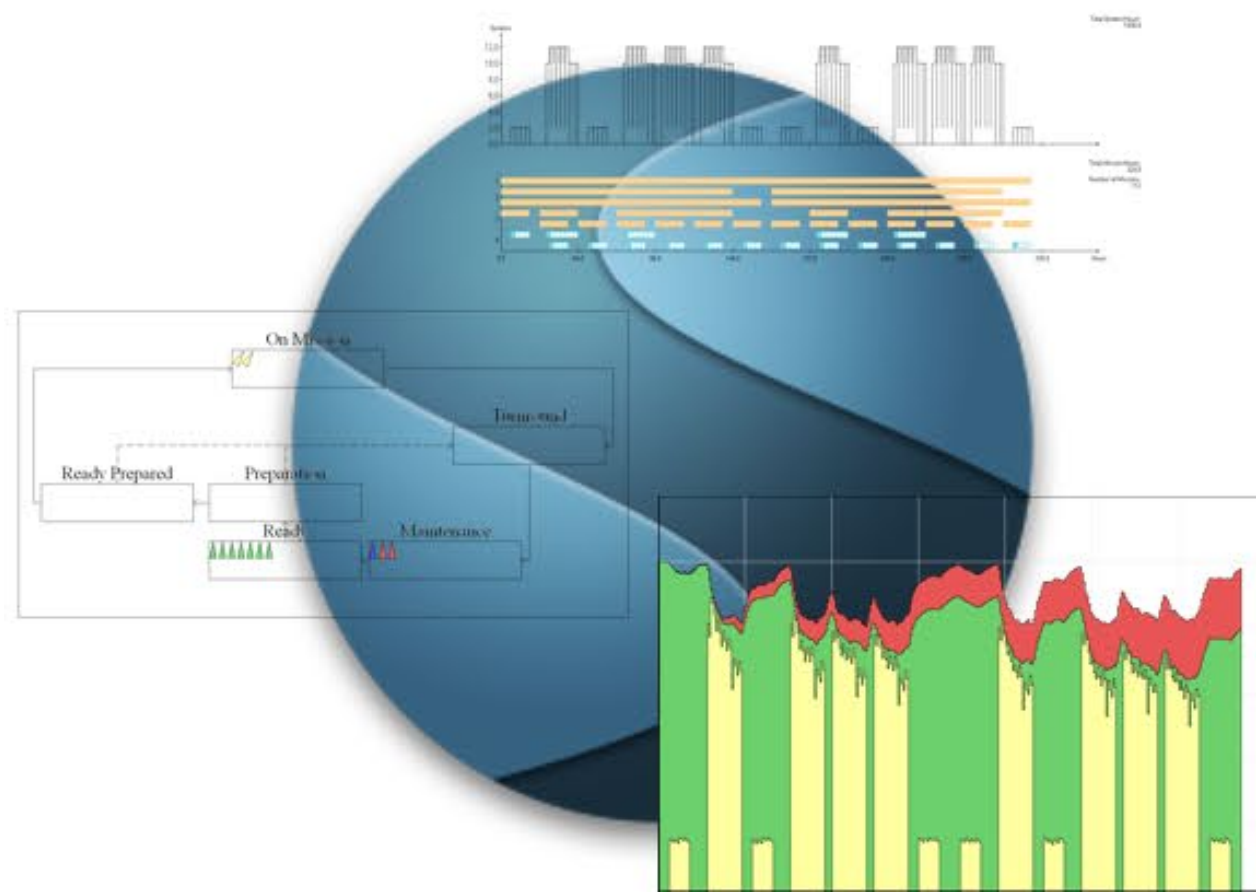
- Highly flexible – scope & methodology user-determined

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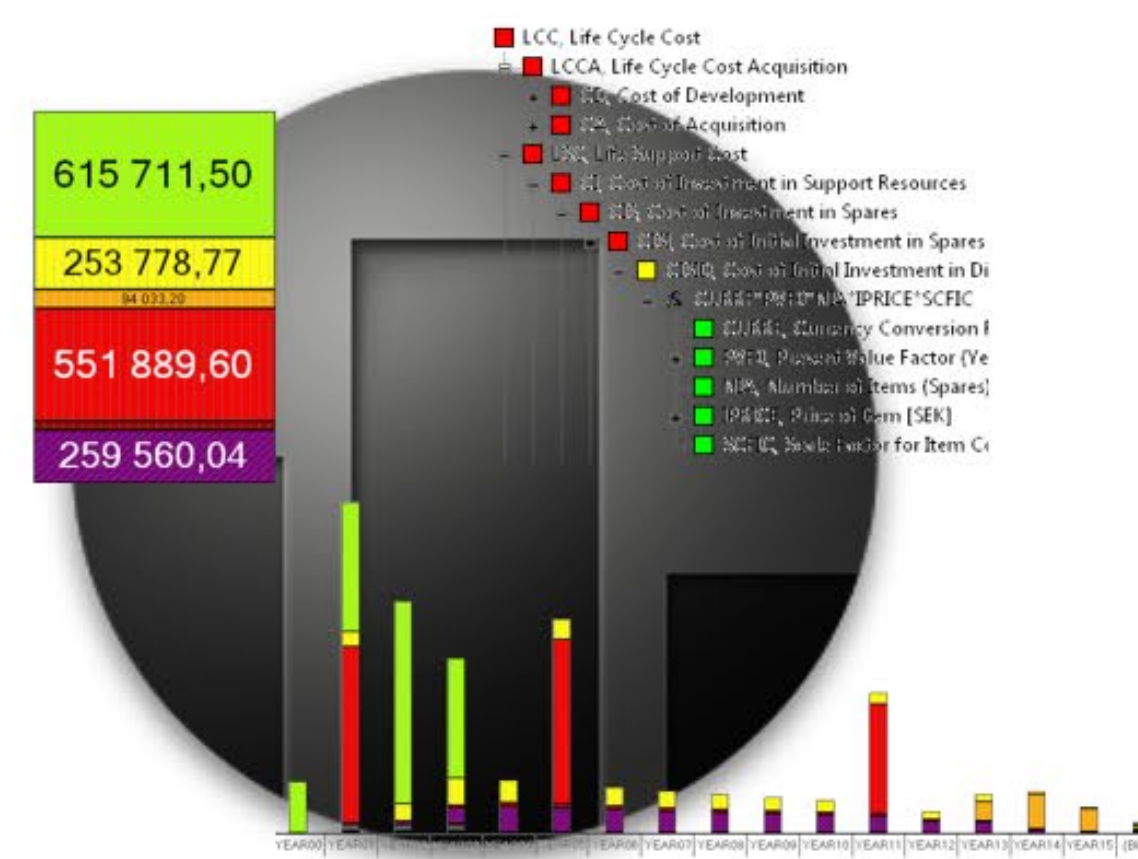
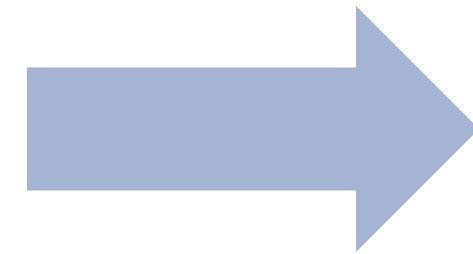


- Highly flexible – scope & methodology user-determined
- Visually appealing, dynamic, detailed results

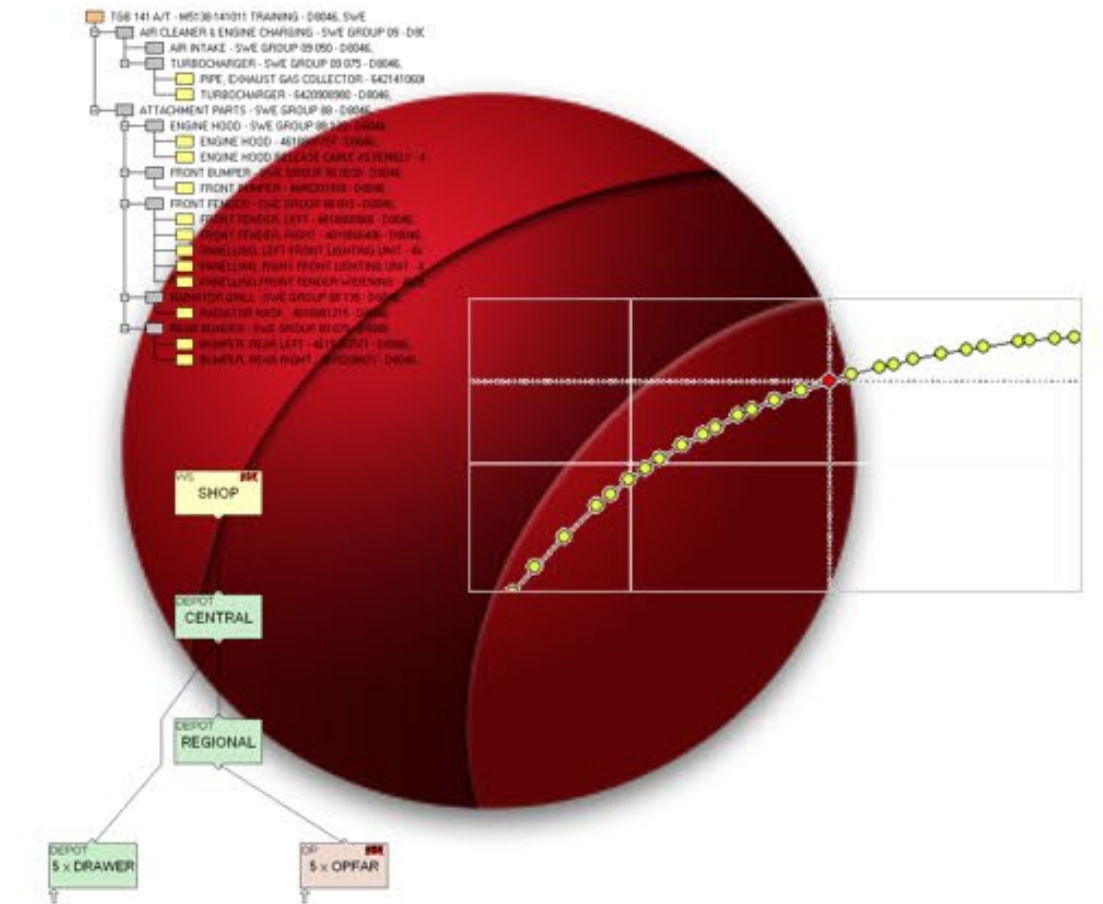
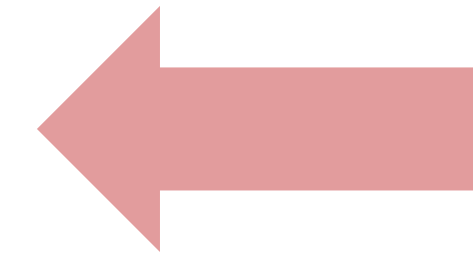
Integration with OPUS10 & SIMLOX



SIMLOX
(.sxo)

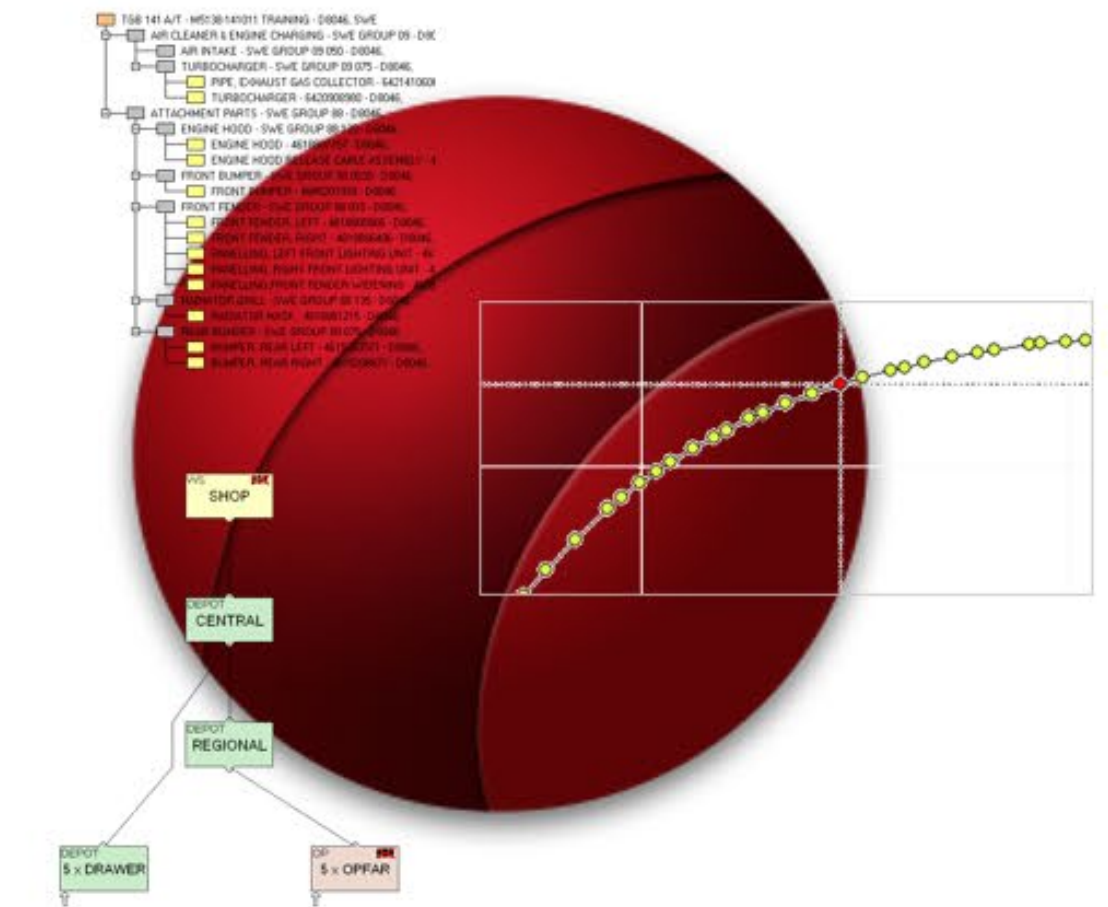
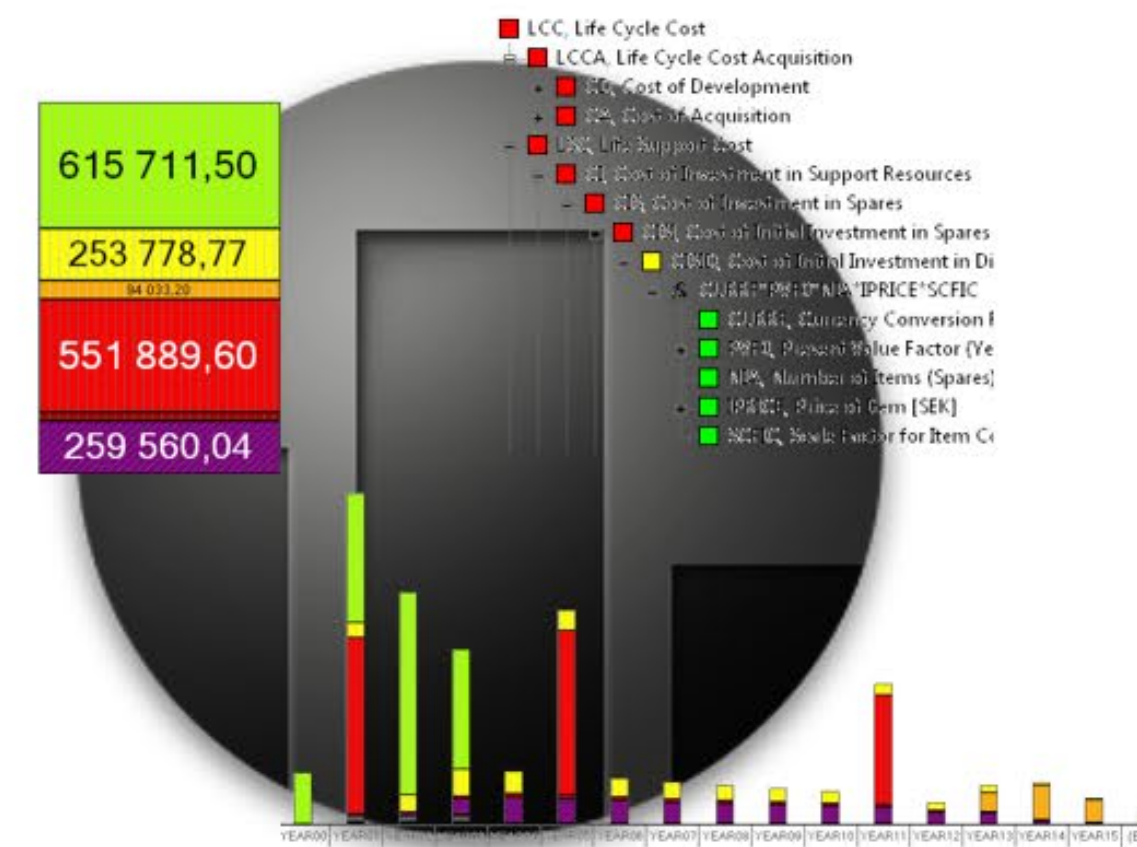


CATLOC
(.cci)



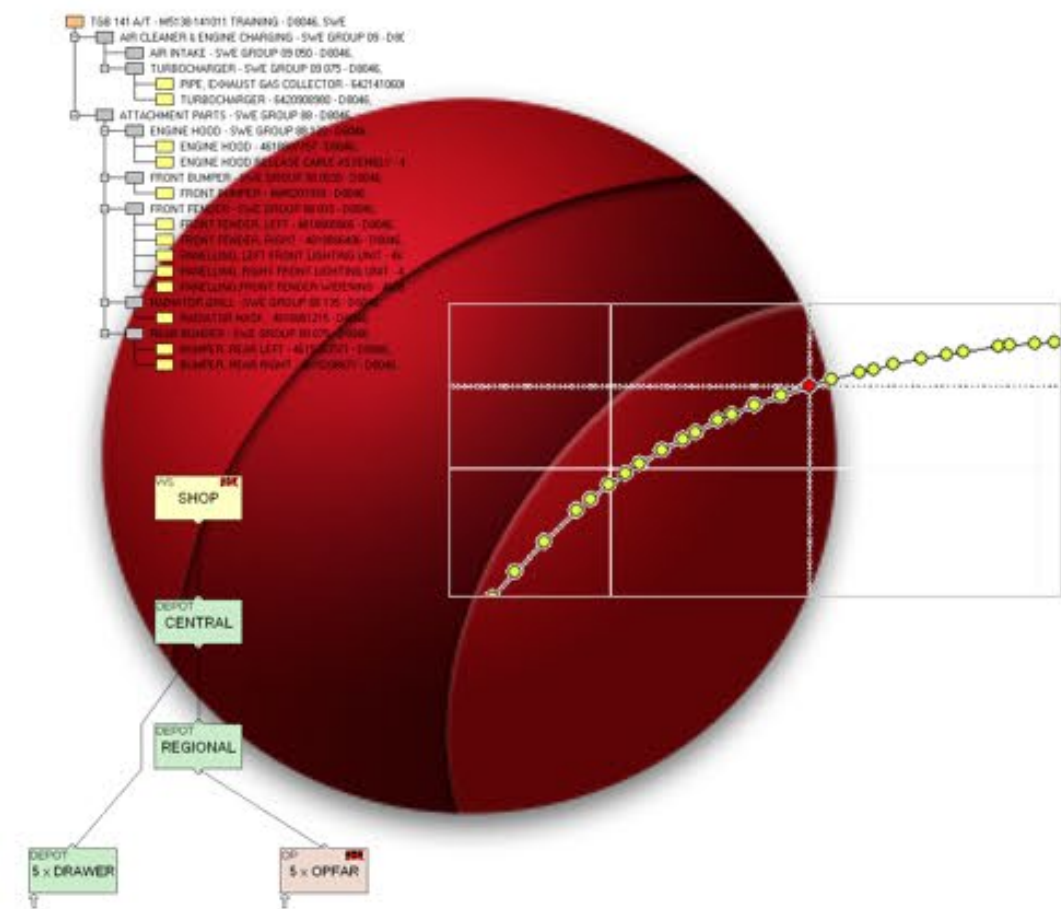
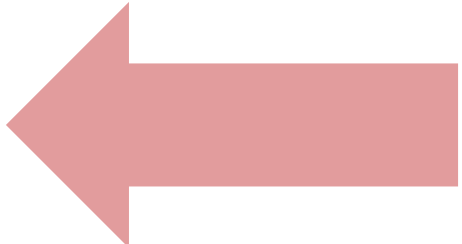
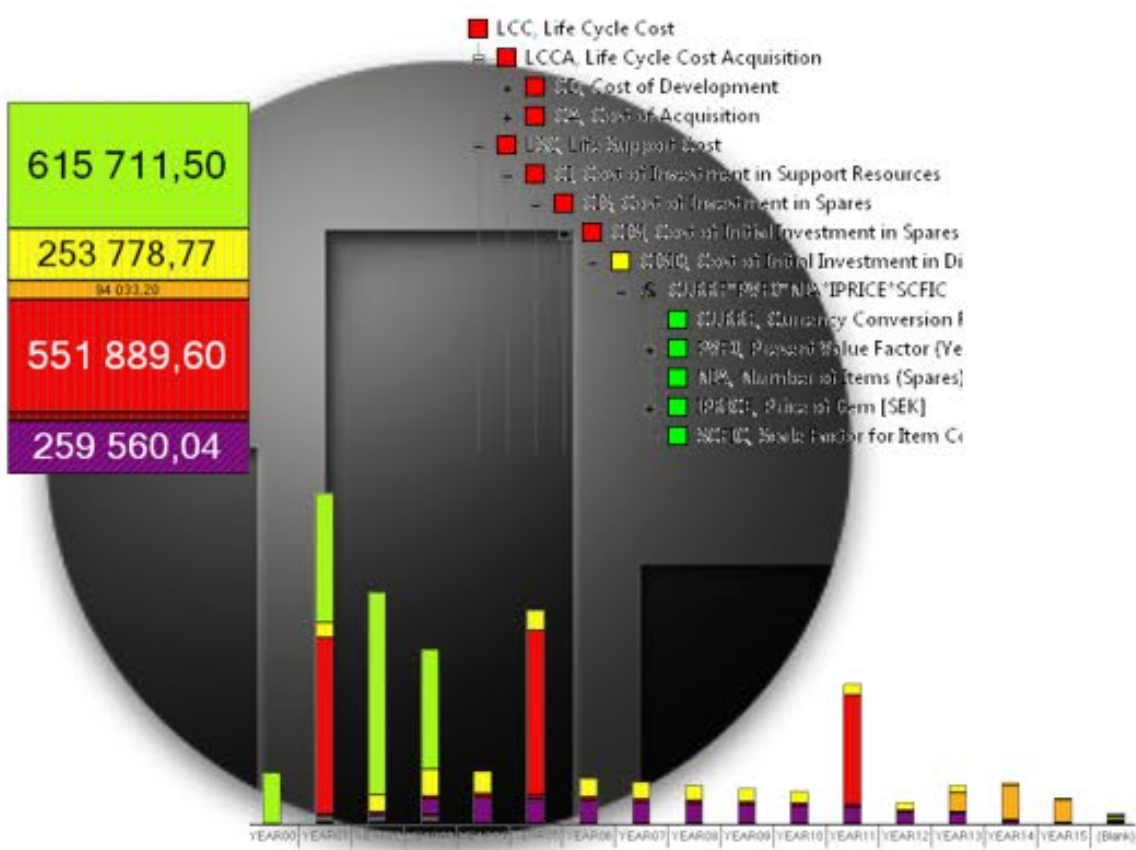
OPUS10
(.opo)

Most of an LCC Model's scope
provided by importing OPUS10
outputs into CATLOC...



Most of an LCC Model's scope
provided by importing OPUS10
outputs into CATLOC...

Saving significant labour and time...

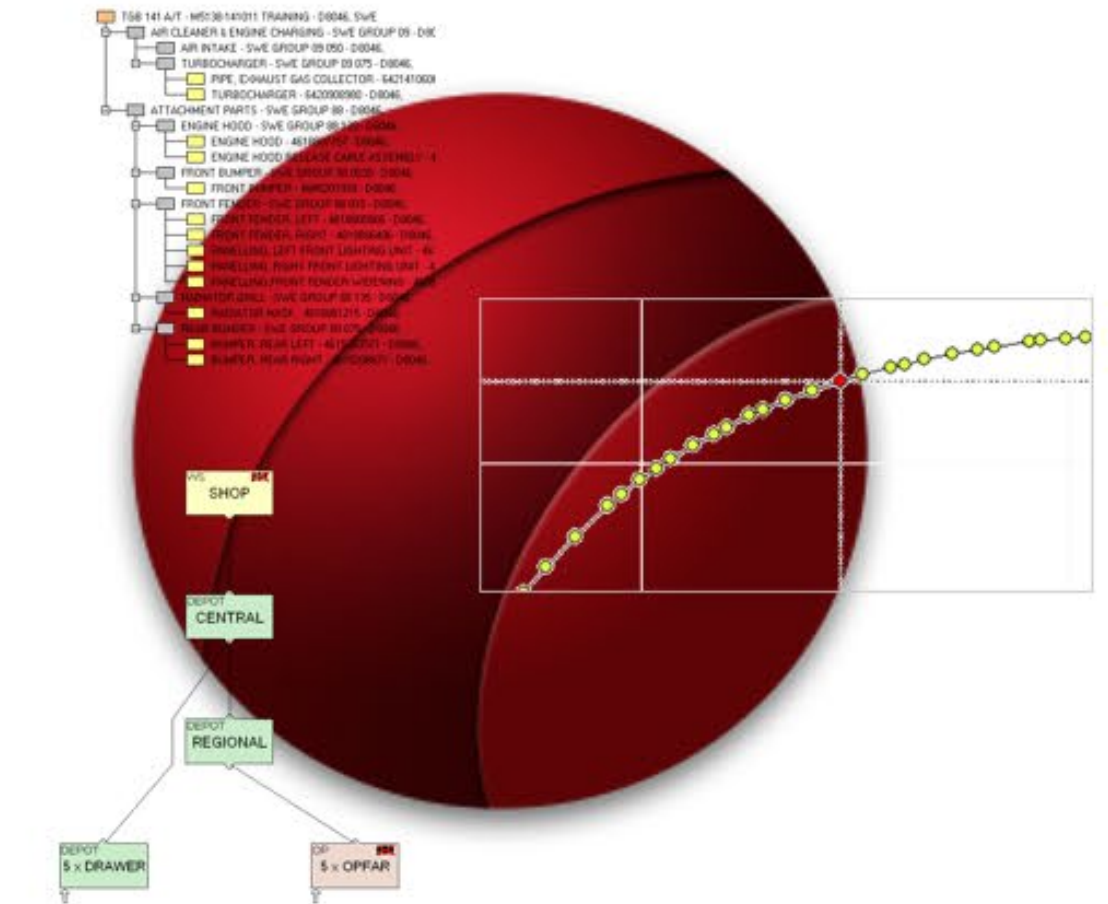
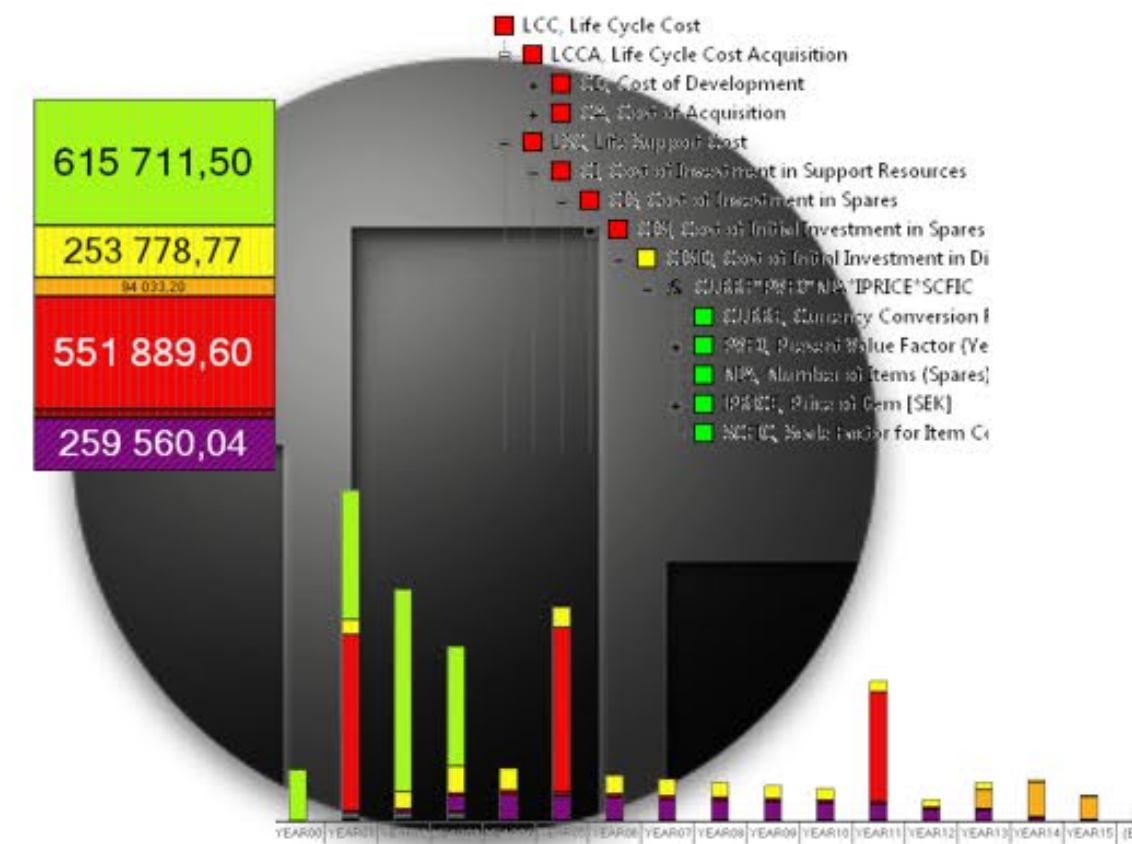


Most of an LCC Model's scope
provided by importing OPUS10
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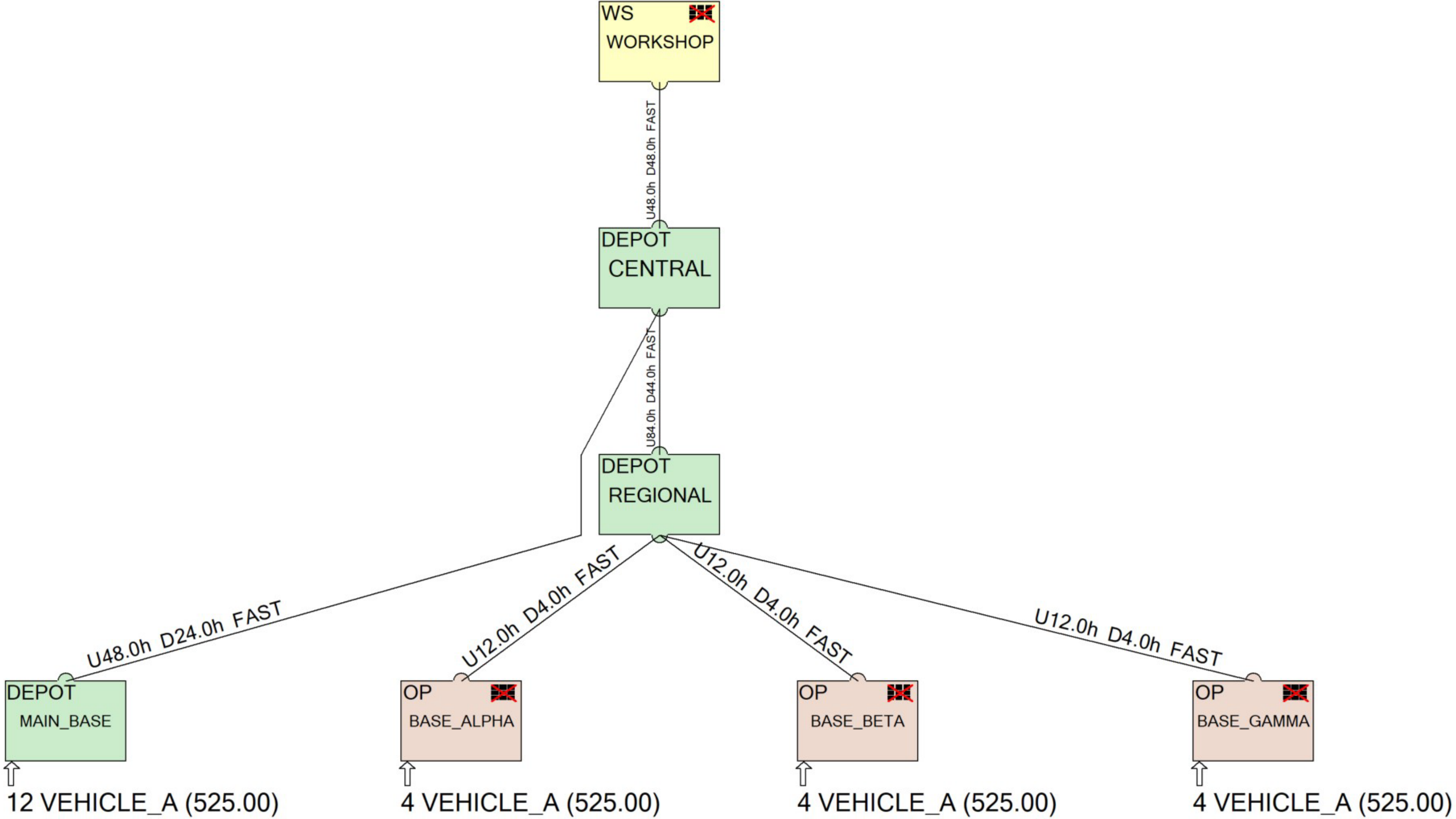
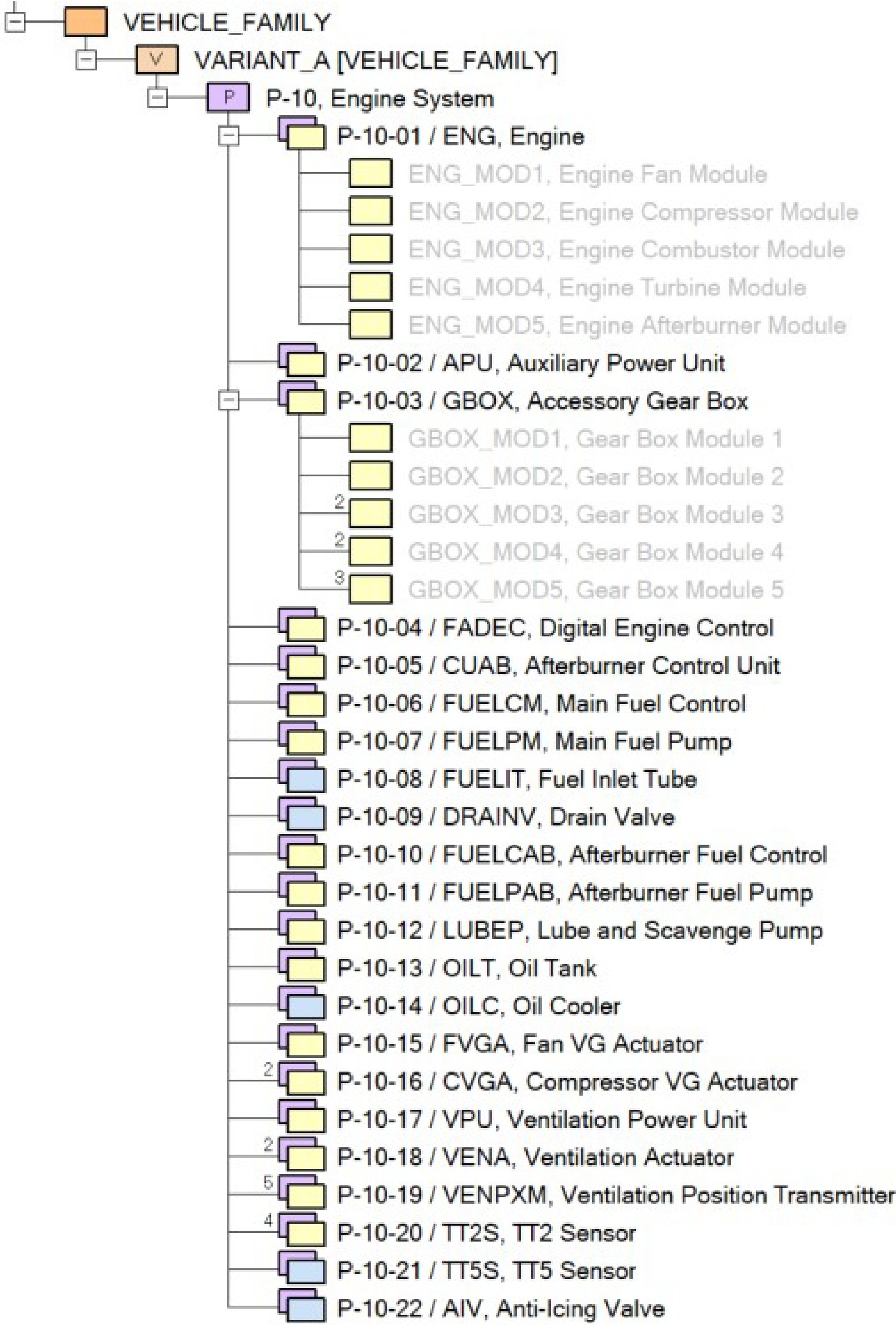
Saving significant labour and time...

& results in a far superior
bottom-up LCC model...

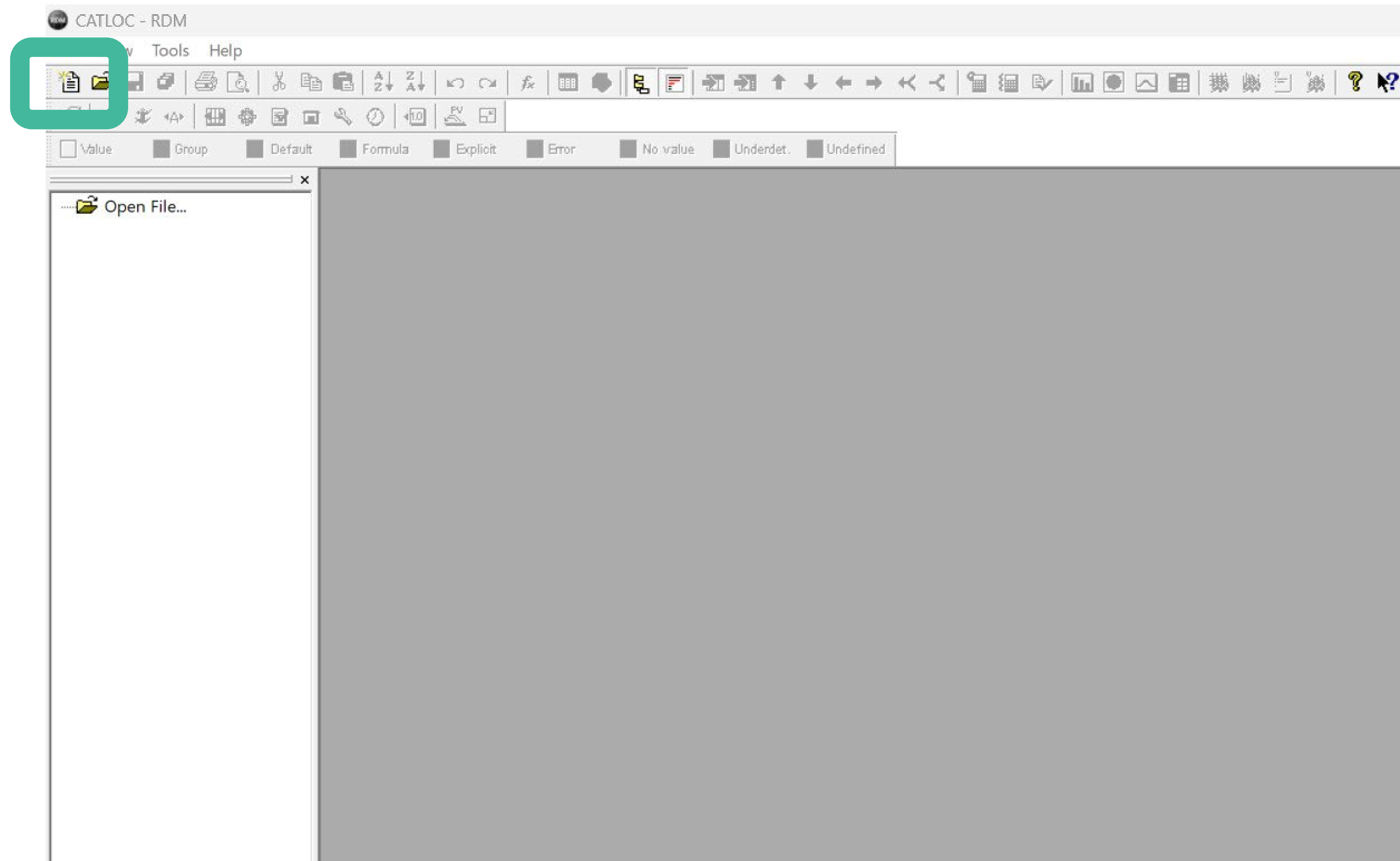
Because a V&V'ed OPUS10 model
= reliable CATLOC model...



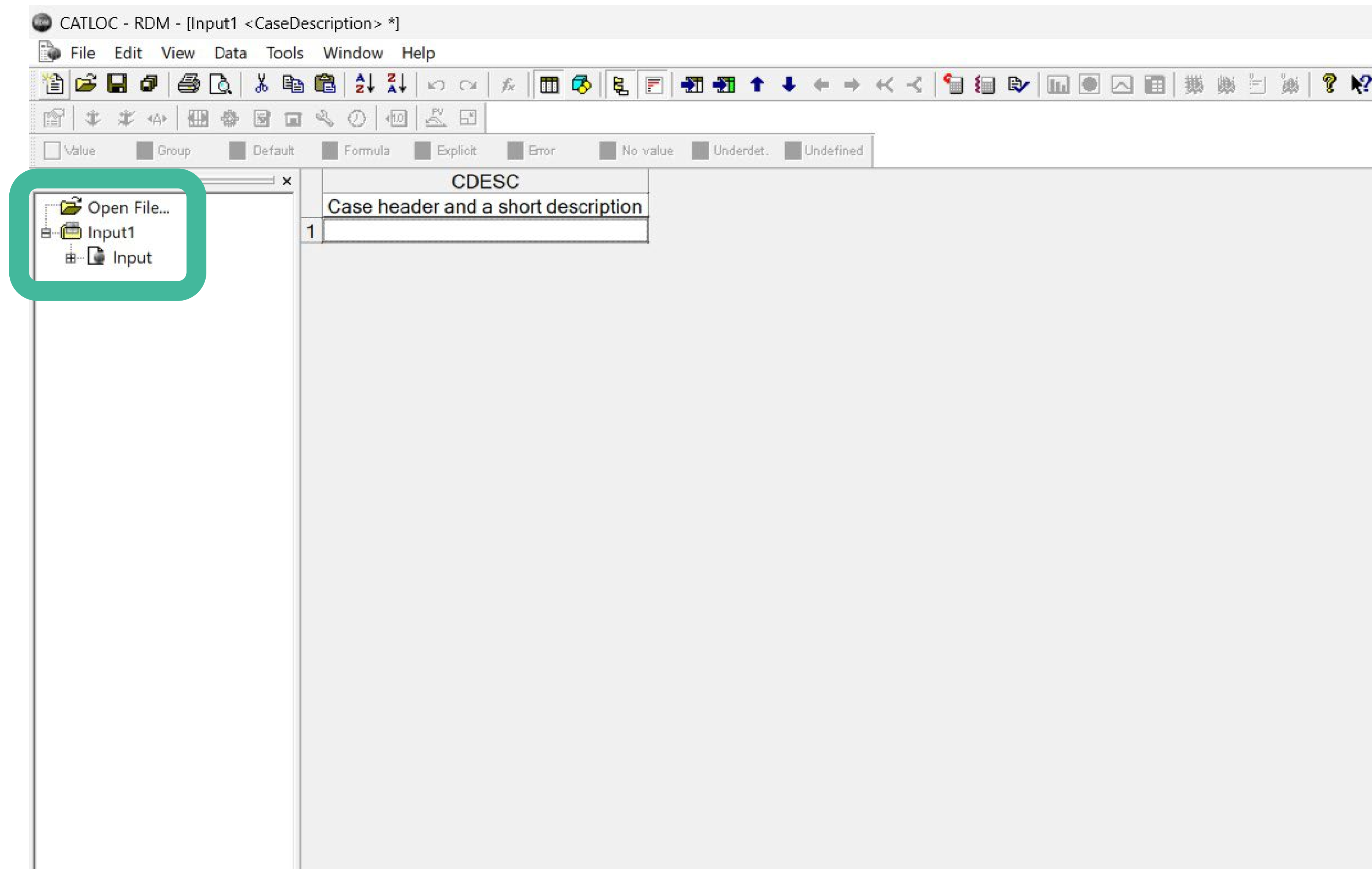
OPUS10 / SIMLOX Import to CATLOC



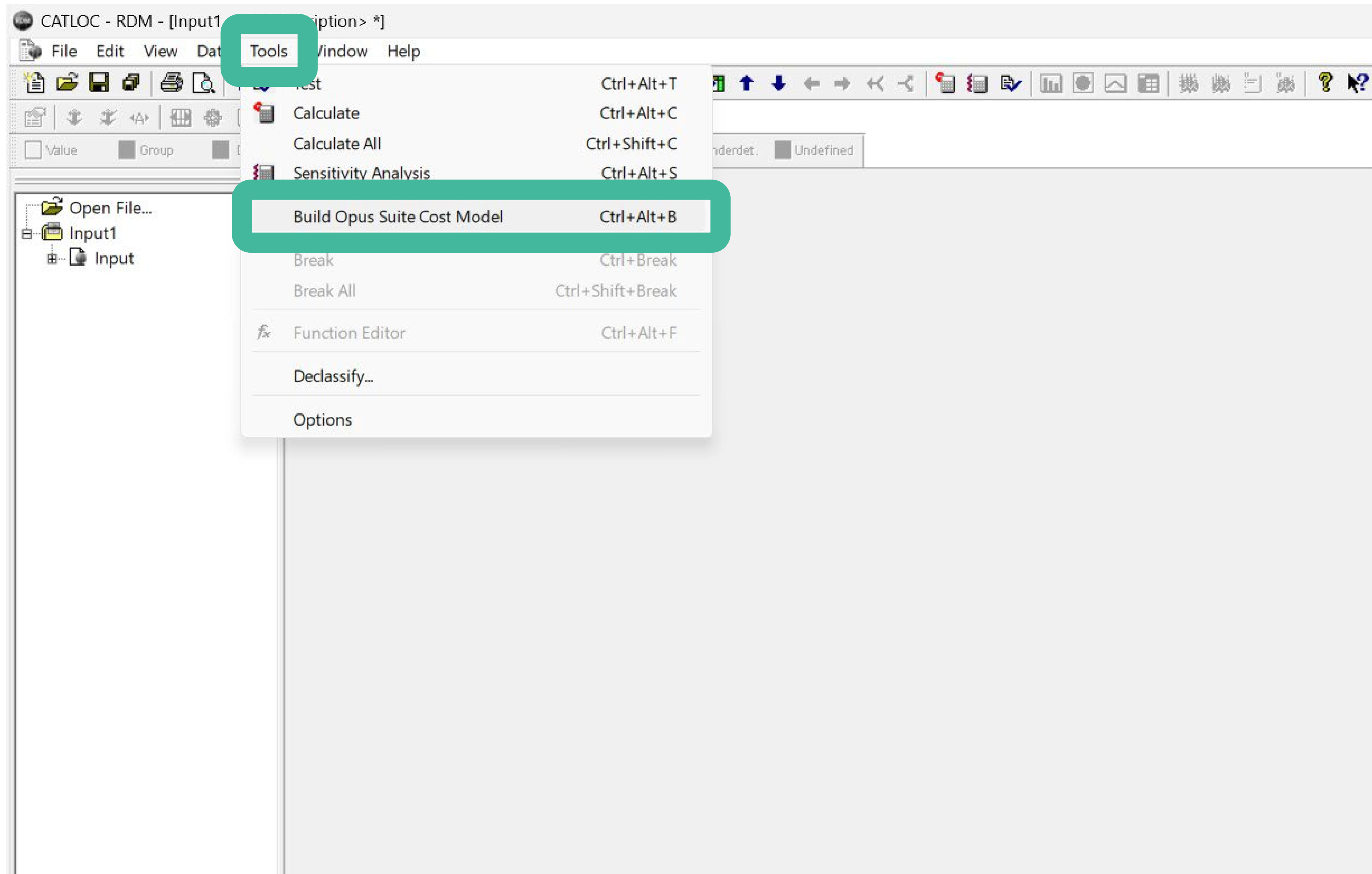
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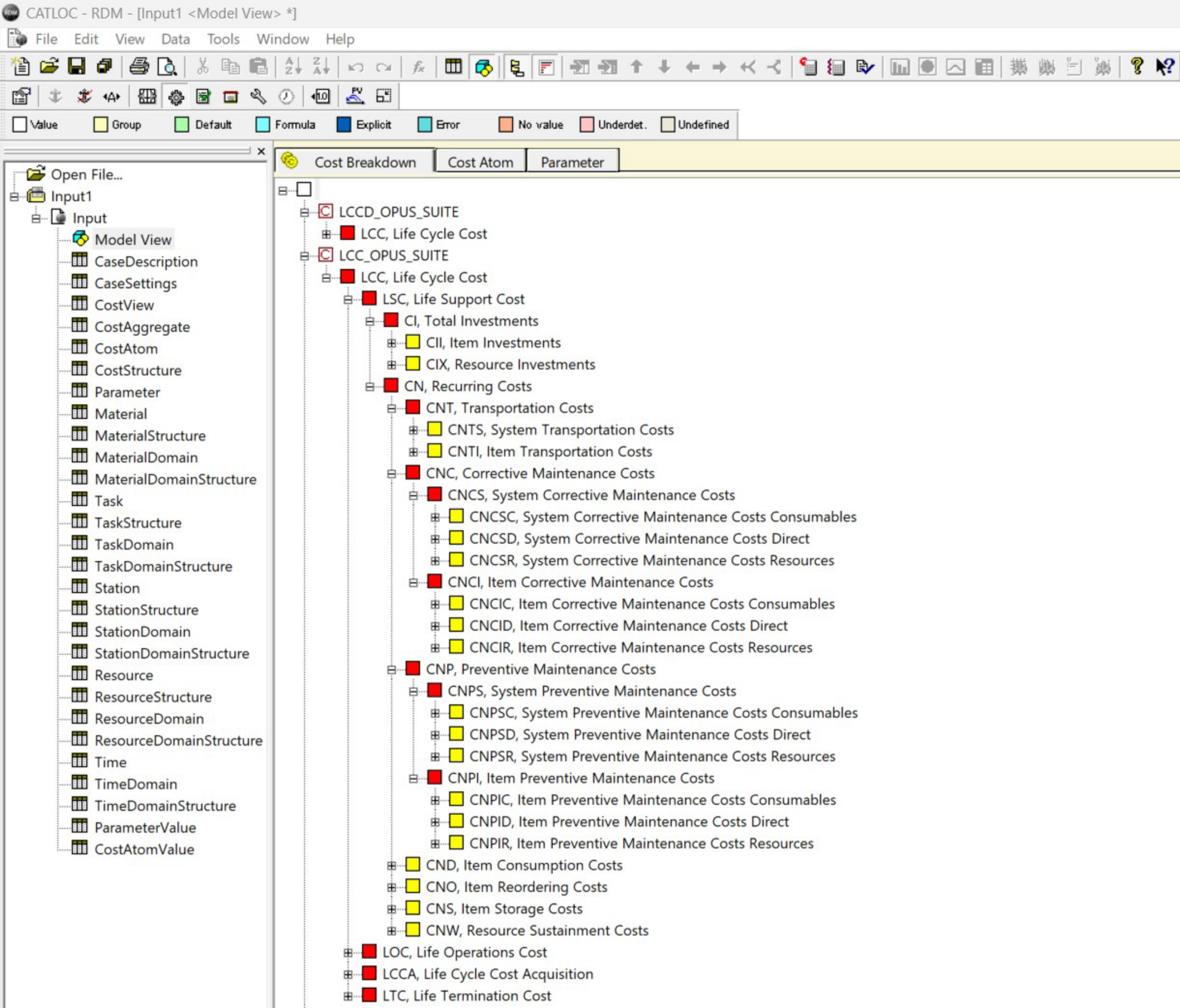
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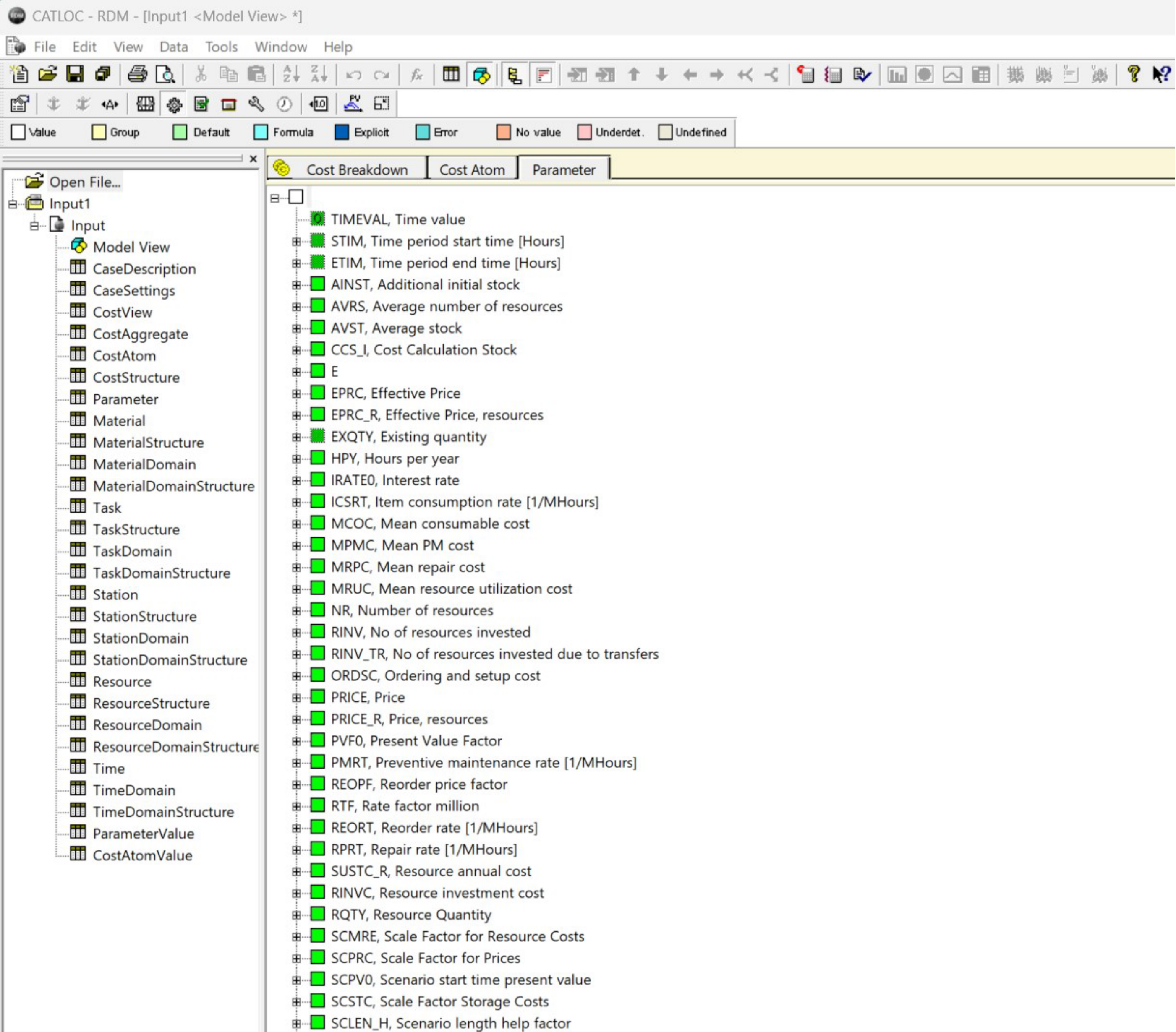
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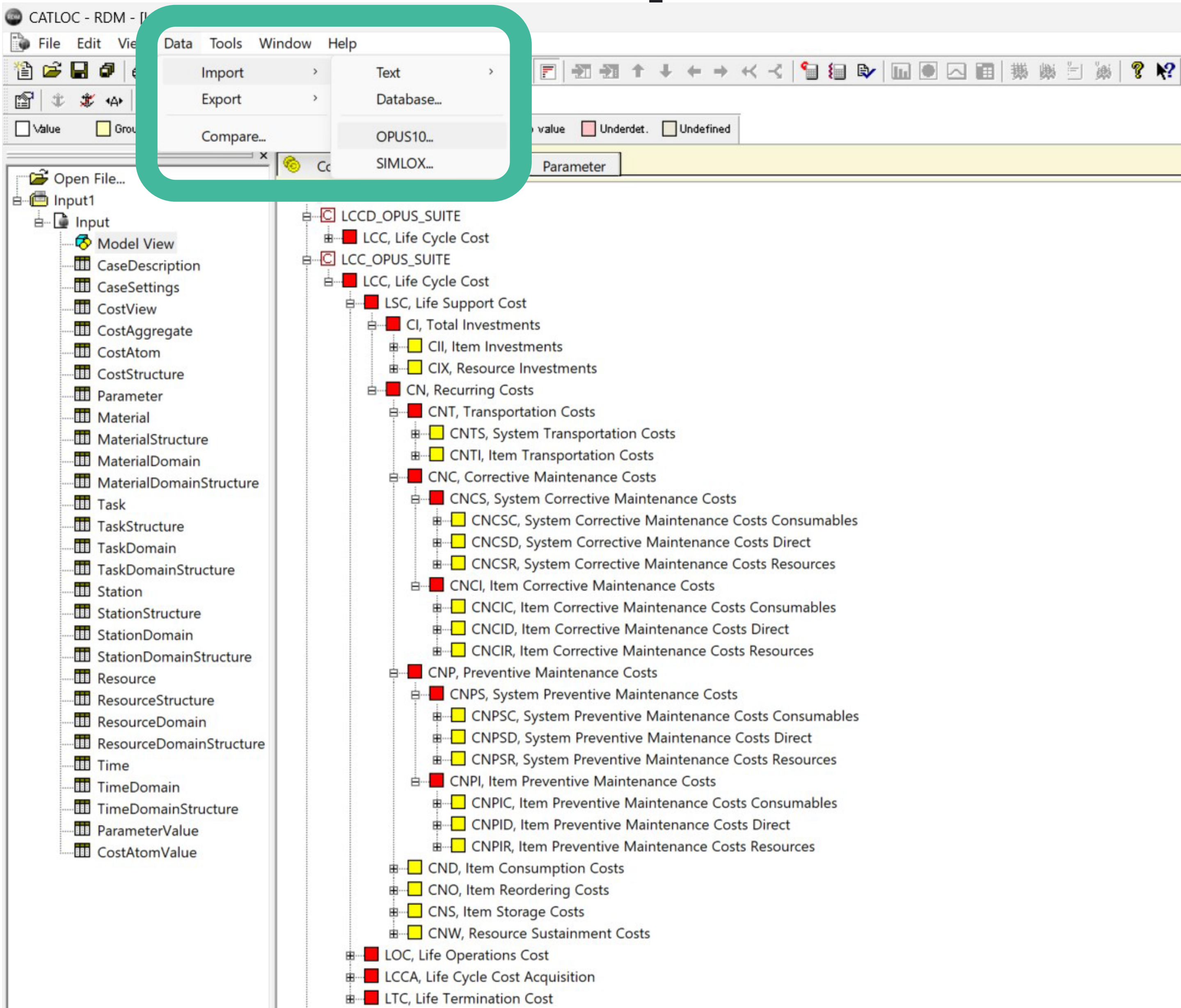
OPUS10 / SIMLOX Import to CATLOC



OPUS10 / SIMLOX Import to CATLOC



OPUS10 / SIMLOX Import to CATLOC



OPUS10 Import to CATLOC

CATLOC - RDM - [Input1 <Model View> *]

File Edit View Data Tools Window Help

Value

Group

Default

Formula

Explicit

Error

No value

Underdet.

Undefined

Open File...

Input1

Input

Model View

CaseDescription

CaseSettings

CostView

CostAggregate

Cost Breakdown

Cost Atom

Parameter

LCCD_OPUS_SUITE

LCC, Life Cycle Cost

LSCD, Life Support Cost Depreciation

CD, Depreciation Costs

CDI, Item Depreciation Costs

CDX, Resource Depreciation Costs

OPUS10 Import

Import Control

Point selector

POINT	A	LSC	LSCD	NBO
18	0.861	5,953,707	5,951,697	2.934
19	0.879	6,196,967	6,194,957	2.525
20	0.881	6,230,860	6,228,850	2.470
21	0.906	6,622,460	6,620,450	1.867
22	0.916	6,781,780	6,779,770	1.635
23	0.921	6,879,300	6,877,290	1.498
24	0.928	7,035,482	7,033,472	1.335
25	0.929	7,060,777	7,058,767	1.313
27	0.951	7,791,592	7,790,162	0.780
29	0.955	7,915,091	7,911,661	0.701
30	0.956	7,967,314	7,964,589	0.671
31	0.958	8,121,154	8,118,429	0.606
32	0.963	8,364,414	8,361,689	0.508
33	0.963	8,392,575	8,390,565	0.497
34	0.964	8,434,002	8,431,992	0.485

Default time period interval

Entire scenario

Years

Months

Weeks

Days

Import parameters

Unselected

Selected

AINST*, Additional initial stock

AVRS*, Average number of resources

AVST*, Average stock

CCS_I*, Cost Calculation Stock

CTAN*, Transport cost

CUNIT*, Storage cost per unit

CVAL*, Storage cost per value

DPY, Demands per year

DPYC, Cyclic demands per year

DPYR, Random demands per year

E*,

EPRC*, Effective Price

EPRC_R*, Effective Price, resources

EXIST, Existing Stock

EXQTY*, Existing quantity

HPY*, Hours per year

ICSPY, Items consumed per year

ICSRT*, Item consumption rate

INCEY, Include Existing Stock

>

>>

<

<<

Cost Related>

Restore

OK

Cancel

CostAtomValue

CNO, Item Reordering Costs

CNS, Item Storage Costs

CNW, Resource Sustainment Costs

LOC, Life Operations Cost

LCCA, Life Cycle Cost Acquisition

LTC, Life Termination Cost

Model View Features

Model View

The screenshot displays the CATLOC - RDM - [Exercise 5c <Model View>] software interface. The interface is divided into several panes. On the left is a 'Model View' tree showing a hierarchical structure of the model, including 'Input', 'Model View', 'CaseDescription', 'CaseSettings', 'CostView', 'CostAggregate', 'CostAtom', 'CostStructure', 'Parameter', 'Material', 'MaterialStructure', 'MaterialDomain', 'MaterialDomainStructure', 'Task', 'TaskStructure', 'TaskDomain', 'TaskDomainStructure', 'Station', 'StationStructure', 'StationDomain', 'StationDomainStructure', 'Resource', 'ResourceStructure', 'ResourceDomain', 'ResourceDomainStructure', 'Time', 'TimeDomain', 'TimeDomainStructure', 'ParameterValue', 'CostAtomValue', 'MaterialTask', 'CostElementColor', 'ColorDefinition', 'CostAtomCategory', and 'Category'. The main area is divided into six columns: 'Material BS', 'Task BS', 'Station BS', 'Resource BS', 'Time', and 'PRICE'. Each column has a 'List' tab and a 'Domain' tab. The 'PRICE' column is the largest and contains a table with columns for 'PRICE', 'All time', 'YEAR1 Year 1', 'YEAR2 Year 2', 'YEAR3 Year 3', 'YEAR4 Year 4', and 'YEARS Year 5'. The table lists various components and their costs over time. At the bottom, there is a status bar with 'Convert time: 0.01 secs', 'Input file: C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c.cci', 'Testing conversion of input data ...', 'Input conversion completed. Errors: 0, Warnings: 0, Notes: 17', and a 'Calculate' button.

Model View

Open File...

Exercise 5c

Model View

CaseDescription

CaseSettings

CostView

CostAggregate

CostAtom

CostStructure

Parameter

Material

MaterialStructure

MaterialDomain

MaterialDomainStructure

Task

TaskStructure

TaskDomain

TaskDomainStructure

Station

StationStructure

StationDomain

StationDomainStructure

Resource

ResourceStructure

ResourceDomain

ResourceDomainStructure

Time

TimeDomain

TimeDomainStructure

ParameterValue

CostAtomValue

MaterialTask

CostElementColor

ColorDefinition

CostAtomCategory

Category

Cost Breakdown

Cost Atom

Parameter

Material BS

Task BS

Station BS

Resource BS

Time

Category

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\E

Convert time: 0.01 secs

Input file: C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c.cci

Testing conversion of input data ...

Input conversion completed. Errors: 0, Warnings: 0, Notes: 17

Convert time: 0.01 secs

Calculate

Model

Report

Import/Export

Compare

Cleanup

Misc

Input Tables

PRICE

Price

ALLTID

All time

YEAR1

Year 1

YEAR2

Year 2

YEAR3

Year 3

YEAR4

Year 4

YEAR5

Year 5

D_SYSTEM_AND_ITEM					
Imported systems and items					
GBOX					
Accessory Gear Box	157,150	157,150	157,150	157,150	157,150
APU					
Auxiliary Power Unit	198,550	198,550	198,550	198,550	198,550
VEHICLE_A	0.0	0.0	0.0	0.0	0.0
GBOX_MOD5					
Gear Box Module 5	21,000	21,000	21,000	21,000	21,000
ENG					
Engine	550,000	550,000	550,000	550,000	550,000
CVGA					
Compressor VG Actuator	25,000	25,000	25,000	25,000	25,000
FUELPA					
Afterburner Fuel Pump	10,210	10,210	10,210	10,210	10,210
FADEC					
Digital Engine Control	446,450	446,450	446,450	446,450	446,450
CUAB					
Afterburner Control Unit	118,200	118,200	118,200	118,200	118,200
LUBEP					
Lube and Scavenge Pump	9,750	9,750	9,750	9,750	9,750
FUELCM					
Main Fuel Control	19,860	19,860	19,860	19,860	19,860
FUELPM					
Main Fuel Pump	12,290	12,290	12,290	12,290	12,290
FUELIT					
Fuel Inlet Tube	930.0	930.0	930.0	930.0	930.0
DRAINV					
Drain Valve	1,430	1,430	1,430	1,430	1,430
TTSS					
TT5 Sensor	1,250	1,250	1,250	1,250	1,250
FUELCAB					
Afterburner Fuel Control	85,700	85,700	85,700	85,700	85,700
FVGA					
Fan VG Actuator	15,000	15,000	15,000	15,000	15,000
OILT					
Oil Tank	6,500	6,500	6,500	6,500	6,500
ENG_MOD4					
Engine Turbine Module	77,100	77,100	77,100	77,100	77,100
OILC					
Oil Cooler	1,160	1,160	1,160	1,160	1,160
VPU					
Ventilation Power Unit	58,550	58,550	58,550	58,550	58,550
ENG_MOD3					
Engine Combustor Module	77,100	77,100	77,100	77,100	77,100
VENA					
Ventilation Actuator	13,930	13,930	13,930	13,930	13,930
VENPXM					
Ventilation Position Transmitter	7,430	7,430	7,430	7,430	7,430

Model View

Open File...

Exercise 5c

Input

Model View

CaseDescription

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CostAggregate

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MaterialDomainStructure

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StationDomainStructure

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ResourceDomainStructure

Time

TimeDomain

TimeDomainStructure

ParameterValue

CostAtomValue

MaterialTask

CostElementColor

ColorDefinition

CostAtomCategory

Category

Cost Breakdown

Cost Atom

Parameter

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c

LCCD_OPUS_SUITE

LCC, Life Cycle Cost

LSCD, Life Support Cost Depreciation

CD, Depreciation Costs

CDI, Item Depreciation Costs

CDX, Resource Depreciation Costs

CN, Recurring Costs

CNT, Transportation Costs

CNTS, System Transportation Costs

CNTI, Item Transportation Costs

CNC, Corrective Maintenance Costs

CNCS, System Corrective Maintenance Costs

CNCSC, System Corrective Maintenance Costs

CNCSD, System Corrective Maintenance Costs

CNCSR, System Corrective Maintenance Costs

CNCI, Item Corrective Maintenance Costs

CNCIC, Item Corrective Maintenance Costs

CNCID, Item Corrective Maintenance Costs

CNCIR, Item Corrective Maintenance Costs

CNP, Preventive Maintenance Costs

CNPS, System Preventive Maintenance Costs

CNPSC, System Preventive Maintenance Costs

CNPSD, System Preventive Maintenance Costs

CNPSR, System Preventive Maintenance Costs

CNPI, Item Preventive Maintenance Costs

CNPIC, Item Preventive Maintenance Costs

CNPID, Item Preventive Maintenance Costs

CNPIR, Item Preventive Maintenance Costs

CND, Item Consumption Costs

CNO, Item Reordering Costs

CNS, Item Storage Costs

CNW, Resource Sustainment Costs

LOC, Life Operations Cost

CG, Cost of Investment in Operation Resources

CGA, Cost of Investment in Other Consumables

CGB, Cost of Investment in Batteries

CGF, Cost of Investment in Fuel/Oil

CGG, Cost of Investment in Lubricants

CO, Cost of Yearly Operations

COA, Yearly Cost of Consumption of Other Consumables

COB, Yearly Cost of Consumption of Batteries

COF, Yearly Cost of Consumption of Fuel

COG, Yearly Cost of Consumption of Lubricants

COP, Yearly Cost of Operation Logging

LCCA, Life Cycle Cost Acquisition

CR, Cost of Development

Category

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c

Material BS

List

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c

GBOX, Accessory Gear Box

APU, Auxiliary Power Unit

VEHICLE_A

GBOX_MOD5, Gear Box

ENG, Engine

CVGA, Compressor VG

FUELPAB, Afterburner Fuel

Task BS

List

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c

FAILURE_APU

FAILURE_FADEC

FAILURE_CUAB

FAILURE_FUELCM

FAILURE_FUELPM

FAILURE_FUELIT

FAILURE_DRAINIV

Station BS

List

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c

BASE_GAMMA

CENTRAL

WORKSHOP

REGIONAL

MAIN_BASE

BASE_ALPHA

BASE_BETA

Resource BS

List

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c

REGIONAL_DEPOT_INV

MAIN_BASE_STORAGE_I

TECHNICIAN

Time

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YEAR1, Year 1

YEAR2, Year 2

YEAR3, Year 3

YEAR4, Year 4

YEAR5, Year 5

YEAR6, Year 6

YEAR7, Year 7

PRICE

Price

P

D_SYSTEM_AND_ITEM

Imported systems and items

GBOX

Accessory Gear Box

APU

Auxiliary Power Unit

VEHICLE_A

ALLTID

All time

YEAR1

Year 1

YEAR2

Year 2

YEAR3

Year 3

YEAR4

Year 4

YEAR5

Year 5

157,150

157,150

157,150

157,150

157,150

198,550

198,550

198,550

198,550

198,550

0.0

0.0

0.0

0.0

0.0

21,000

21,000

21,000

21,000

21,000

550,000

550,000

550,000

550,000

550,000

25,000

25,000

25,000

25,000

25,000

10,210

10,210

10,210

10,210

10,210

446,450

446,450

446,450

446,450

446,450

118,200

118,200

118,200

118,200

118,200

9,750

9,750

9,750

9,750

9,750

19,860

19,860

19,860

19,860

19,860

12,290

12,290

12,290

12,290

12,290

930.0

930.0

930.0

930.0

930.0

1,430

1,430

1,430

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1,250

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1,250

85,700

85,700

85,700

85,700

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15,000

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15,000

6,500

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6,500

77,100

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77,100

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58,550

58,550

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58,550

77,100

77,100

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13,930

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13,930

13,930

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7,430

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Calculate

Model

Report

Import/Export

Compare

Cleanup

Misc

Cost Breakdown,
Cost Atom &
Parameter
Explorer

Model View

FileEditViewDataToolsWindowHelp

ValueGroupDefaultFormulaExplicitErrorNo valueUnderdetUndefined

Open File...Exercise 5c

Model View

CaseDescription

CaseSettings

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CostAggregate

CostAtom

CostStructure

Parameter

Material

MaterialStructure

MaterialDomain

MaterialDomainStructure

Task

TaskStructure

TaskDomain

TaskDomainStructure

Station

StationStructure

StationDomain

StationDomainStructure

Resource

ResourceStructure

ResourceDomain

ResourceDomainStructure

Time

TimeDomain

TimeDomainStructure

ParameterValue

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MaterialTask

CostElementColor

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CostAtomCategory

Category

Cost Breakdown

Cost Atom

Parameter

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c

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CR, Cost of Development

Material BS

Task BS

Station BS

Resource BS

Time

PRICE

ALLTID

YEAR1

YEAR2

YEAR3

YEAR4

YEAR5

FUELCA

FVGA

OILT

ENG_MOD4

OILC

VPU

ENG_MOD3

VENA

VENPXM

85,700

15,000

6,500

77,100

1,160

58,550

77,100

13,930

7,430

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CalculateModelReportImport/ExportCompareCleanupMisc

Dimensions

- Material

- Task

- Station

- Resource

- Time

Model View

File Edit View Data Tools Window Help

Value Group Default Formula Explicit Error No value Underdet. Undefined

Open File... Exercise 5c Input Model View CaseDescription CaseSettings CostView CostAggregate CostAtom CostStructure Parameter Material MaterialStructure MaterialDomain MaterialDomainStructure Task TaskStructure TaskDomain TaskDomainStructure Station StationStructure StationDomain StationDomainStructure Resource ResourceStructure ResourceDomain ResourceDomainStructure Time TimeDomain TimeDomainStructure ParameterValue CostAtomValue MaterialTask CostElementColor ColorDefinition CostAtomCategory Category

Cost Breakdown Cost Atom Parameter

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CNCSD, System Corrective Maintenance Cos

CNCSR, System Corrective Maintenance Cos

CNCI, Item Corrective Maintenance Costs

CNCIC, Item Corrective Maintenance Costs C

CNCID, Item Corrective Maintenance Costs I

CNCIR, Item Corrective Maintenance Costs R

CNP, Preventive Maintenance Costs

CNPS, System Preventive Maintenance Costs

CNPSC, System Preventive Maintenance Cos

CNPSD, System Preventive Maintenance Cos

CNPSR, System Preventive Maintenance Cos

CNPPI, Item Preventive Maintenance Costs

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CGG, Cost of Investment in Lubricants

CO, Cost of Yearly Operations

COA, Yearly Cost of Consumption of Other Consumables

COB, Yearly Cost of Consumption of Batteries

COF, Yearly Cost of Consumption of Fuel

COG, Yearly Cost of Consumption of Lubricants

COP, Yearly Cost of Operation Logging

LCCA, Life Cycle Cost Acquisition

CR, Cost of Development

Material BS List

GBOX, Accessory Gear Box

APU, Auxiliary Power Unit

VEHICLE_A

GBOX_MOD5, Gear Box Module 5

ENG, Engine

CVGA, Compressor VG Actuator

FUELPM, Afterburner Fuel Pump

FADEC, Digital Engine Control

CUAB, Afterburner Control Unit

LUBEP, Lube and Scavenge Pump

FUELCM, Main Fuel Control

FUELPM, Main Fuel Pump

FUELIT, Fuel Inlet Tube

DRAINV, Drain Valve

TTSS, TT5 Sensor

FUELCAB, Afterburner Fuel Control

FVGA, Fan VG Actuator

OILT, Oil Tank

ENG_MOD4, Engine Afterburner

OILC, Oil Cooler

VPU, Ventilation Power Unit

ENG_MOD3, Engine Afterburner

VENA, Ventilation Actuator

VENPXM, Ventilation Position Transmitter

TT2S, TT2 Sensor

AIV, Anti-Icing Valve

ENG_MOD1, Engine Afterburner

ENG_MOD2, Engine Afterburner

ENG_MOD5, Engine Afterburner

GBOX_MOD1, Gear Box

GBOX_MOD2, Gear Box

GBOX_MOD3, Gear Box

GBOX_MOD4, Gear Box

Task BS List

FAILURE_APU

FAILURE_FADEC

FAILURE_CUAB

FAILURE_FUELCM

FAILURE_FUELPM

FAILURE_FUELIT

FAILURE_DRAINV

FAILURE_FUELCAB

FAILURE_FUELPM

FAILURE_LUBEP

FAILURE_OILT

FAILURE_OILC

FAILURE_FVGA

FAILURE_VPU

FAILURE_VENA

FAILURE_VENPXM

FAILURE_TT2S

FAILURE_TTSS

FAILURE_AIV

FAILURE_ENG_MOD1

FAILURE_ENG_MOD2

FAILURE_ENG_MOD3

FAILURE_ENG_MOD4

FAILURE_ENG_MOD5

FAILURE_GBOX_MOD1

FAILURE_GBOX_MOD2

FAILURE_GBOX_MOD3

FAILURE_GBOX_MOD4

FAILURE_GBOX_MOD5

PM_PLAN_VEHICLE

Station BS List

BASE_GAMMA

CENTRAL

WORKSHOP

REGIONAL

MAIN_BASE

BASE_ALPHA

BASE_BETA

Resource BS List

REGIONAL_DEPOT_INV

MAIN_BASE_STORAGE_INV

TECHNICIAN

Time

YEAR1, Year 1

YEAR2, Year 2

YEAR3, Year 3

YEAR4, Year 4

YEAR5, Year 5

YEAR6, Year 6

YEAR7, Year 7

YEAR8, Year 8

YEAR9, Year 9

YEAR10, Year 10

PRICE Price

ALLTID All time

YEAR1 Year 1

YEAR2 Year 2

YEAR3 Year 3

YEAR4 Year 4

YEAR5 Year 5

D_SYSTEM_AND_ITEM

Imported systems and items

GBOX Accessory Gear Box

APU Auxiliary Power Unit

VEHICLE_A

GBOX_MOD5 Gear Box Module 5

ENG Engine

CVGA Compressor VG Actuator

FUELPM Afterburner Fuel Pump

FADEC Digital Engine Control

CUAB Afterburner Control Unit

LUBEP Lube and Scavenge Pump

FUELCM Main Fuel Control

FUELPM Main Fuel Pump

FUELIT Fuel Inlet Tube

DRAINV Drain Valve

TTSS TT5 Sensor

FUELCAB Afterburner Fuel Control

FVGA Fan VG Actuator

OILT Oil Tank

ENG_MOD4 Engine Afterburner

OILC Oil Cooler

VPU Ventilation Power Unit

ENG_MOD3 Engine Afterburner

VENA Ventilation Actuator

VENPXM Ventilation Position Transmitter

TT2S TT2 Sensor

AIV Anti-Icing Valve

ENG_MOD1 Engine Afterburner

ENG_MOD2 Engine Afterburner

ENG_MOD5 Engine Afterburner

GBOX_MOD1 Gear Box

GBOX_MOD2 Gear Box

GBOX_MOD3 Gear Box

GBOX_MOD4 Gear Box

Domain Result group

ALLMTID, All materials

D_MATERIAL, Imported

ALLMTID, All tasks

D_TASK, Imported tasks

ALLSTID, All stations

D_STATION_AND_UNIT, Imported

ALLRID, All resources

D_RESOURCE, Imported

ALLTID, All time

YEAR1, Year 1

YEAR2, Year 2

YEAR3, Year 3

YEAR4, Year 4

YEAR5, Year 5

YEAR6, Year 6

YEAR7, Year 7

YEAR8, Year 8

YEAR9, Year 9

YEAR10, Year 10

Category

C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c.cci

Convert time: 0.01 secs

Input file: C:\Users\JamesFoley\Desktop\2023 Australia OPUS Suite Conference\Exercise 5c.cci

Testing conversion of input data ...

Input conversion completed. Errors: 0, Warnings: 0, Notes: 17

Convert time: 0.01 secs

Calculate Model Report Import/Export Compare Cleanup Misc

Domains

Model View

Parameter Tables

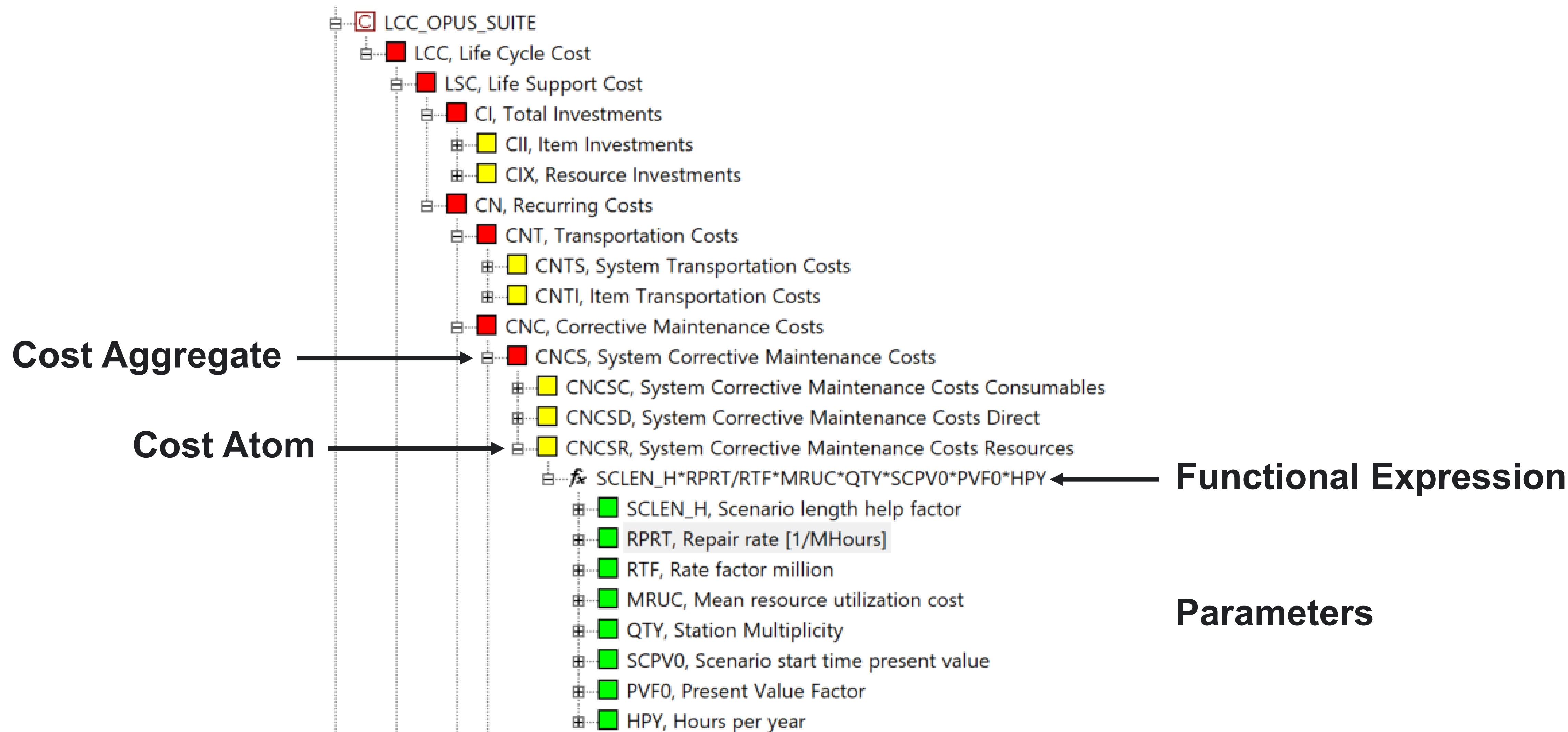
- **Tables of numbers defined against one or more dimensions**
- **Cells/ fields can be manually amended**

Des	PRICE Price P	 ALLTID All time   	YEAR1 Year 1	YEAR2 Year 2	YEAR3 Year 3	YEAR4 Year 4	YEAR5 Year 5
	D_SYSTEM_AND_ITEM  Imported systems and items   						
	GBOX Accessory Gear Box		157,150	157,150	157,150	157,150	157,150
	APU Auxiliary Power Unit		198,550	198,550	198,550	198,550	198,550
	VEHICLE_A		0.0	0.0	0.0	0.0	0.0
	GBOX_MOD5 Gear Box Module 5		21,000	21,000	21,000	21,000	21,000
	ENG Engine		550,000	550,000	550,000	550,000	550,000
	CVGA Compressor VG Actuator		25,000	25,000	25,000	25,000	25,000
	FUELPA8 Afterburner Fuel Pump		10,210	10,210	10,210	10,210	10,210
	FADEC Digital Engine Control		446,450	446,450	446,450	446,450	446,450
	CUAB Afterburner Control Unit		118,200	118,200	118,200	118,200	118,200
	LUBEP Lube and Scavenge Pump		9,750	9,750	9,750	9,750	9,750
	FUELCM Main Fuel Control		19,860	19,860	19,860	19,860	19,860
	FUELPM Main Fuel Pump		12,290	12,290	12,290	12,290	12,290
	FUELIT Fuel Inlet Tube		930.0	930.0	930.0	930.0	930.0
	DRAINV Drain Valve		1,430	1,430	1,430	1,430	1,430
	TTSS TTS Sensor		1,250	1,250	1,250	1,250	1,250
	FUELCAB Afterburner Fuel Control		85,700	85,700	85,700	85,700	85,700
	FVGA Fan VG Actuator		15,000	15,000	15,000	15,000	15,000
Des	OILT Oil Tank		6,500	6,500	6,500	6,500	6,500
	ENG_MOD4 Engine Turbine Module		77,100	77,100	77,100	77,100	77,100
	OILC Oil Cooler		1,160	1,160	1,160	1,160	1,160
	VPU Ventilation Power Unit		58,550	58,550	58,550	58,550	58,550
	ENG_MOD3 Engine Combustor Module		77,100	77,100	77,100	77,100	77,100
	VENA Ventilation Actuator		13,930	13,930	13,930	13,930	13,930
	VENPXM Ventilation Position Transmitter		7,430	7,430	7,430	7,430	7,430

Model View

RPRT Repair rate		☒ ALLTID All time	YEAR1 Year 1							YEAR2 Year 2
P		☒ D_STATION_AND_UNIT Imported stations and units	BASE_GAMMA	CENTRAL	WORKSHOP	REGIONAL	MAIN_BASE	BASE_ALPHA	BASE_BETA	BASE_GAMMA
D_SYSTEM_AND_ITEM ☒ Imported systems and items	D_CM ☒ Imported corrective maintenance tasks									
GBOX Accessory Gear Box	FAILURE_GBOX_MOD1		0.0	63.60	0.0	0.0	0.0	0.0	0.0	0.0
	FAILURE_GBOX_MOD2		0.0	12.72	0.0	0.0	0.0	0.0	0.0	0.0
	FAILURE_GBOX_MOD3		0.0	63.60	0.0	0.0	0.0	0.0	0.0	0.0
	FAILURE_GBOX_MOD4		0.0	114.5	0.0	0.0	0.0	0.0	0.0	0.0
	FAILURE_GBOX_MOD5		0.0	63.60	0.0	0.0	0.0	0.0	0.0	0.0
APU Auxiliary Power Unit	FAILURE_APU		0.0	0.0	586.7	0.0	0.0	0.0	0.0	0.0
VEHICLE_A	FAILURE_APU		97.79	0.0	0.0	0.0	293.4	97.79	97.79	97.79
	FAILURE_FADEC		7.671	0.0	0.0	0.0	23.01	7.671	7.671	7.671
	FAILURE_CUAB		30.21	0.0	0.0	0.0	90.62	30.21	30.21	30.21
	FAILURE_FUELCM		15.25	0.0	0.0	0.0	45.74	15.25	15.25	15.25
	FAILURE_FUELPM		109.2	0.0	0.0	0.0	327.7	109.2	109.2	109.2
	FAILURE_FUELIT		13.62	0.0	0.0	0.0	40.85	13.62	13.62	13.62
	FAILURE_DRAINV		83.39	0.0	0.0	0.0	250.2	83.39	83.39	83.39
	FAILURE_FUELCAB		13.42	0.0	0.0	0.0	40.27	13.42	13.42	13.42
	FAILURE_FUELPAB		25.89	0.0	0.0	0.0	77.67	25.89	25.89	25.89
	FAILURE_LUBEP		15.75	0.0	0.0	0.0	47.25	15.75	15.75	15.75
	FAILURE_OILT		8.561	0.0	0.0	0.0	25.68	8.561	8.561	8.561
	FAILURE_OILC		95.89	0.0	0.0	0.0	287.7	95.89	95.89	95.89
	FAILURE_FVGA		8.561	0.0	0.0	0.0	25.68	8.561	8.561	8.561
	FAILURE_CVGA		17.67	0.0	0.0	0.0	53.00	17.67	17.67	17.67
	FAILURE_VPU		446.8	0.0	0.0	0.0	1,341	446.8	446.8	446.8
	FAILURE_VENA		16.30	0.0	0.0	0.0	48.90	16.30	16.30	16.30
	FAILURE_VENPXM		41.95	0.0	0.0	0.0	125.9	41.95	41.95	41.95

Model View



Model View

Cost Atom Tables

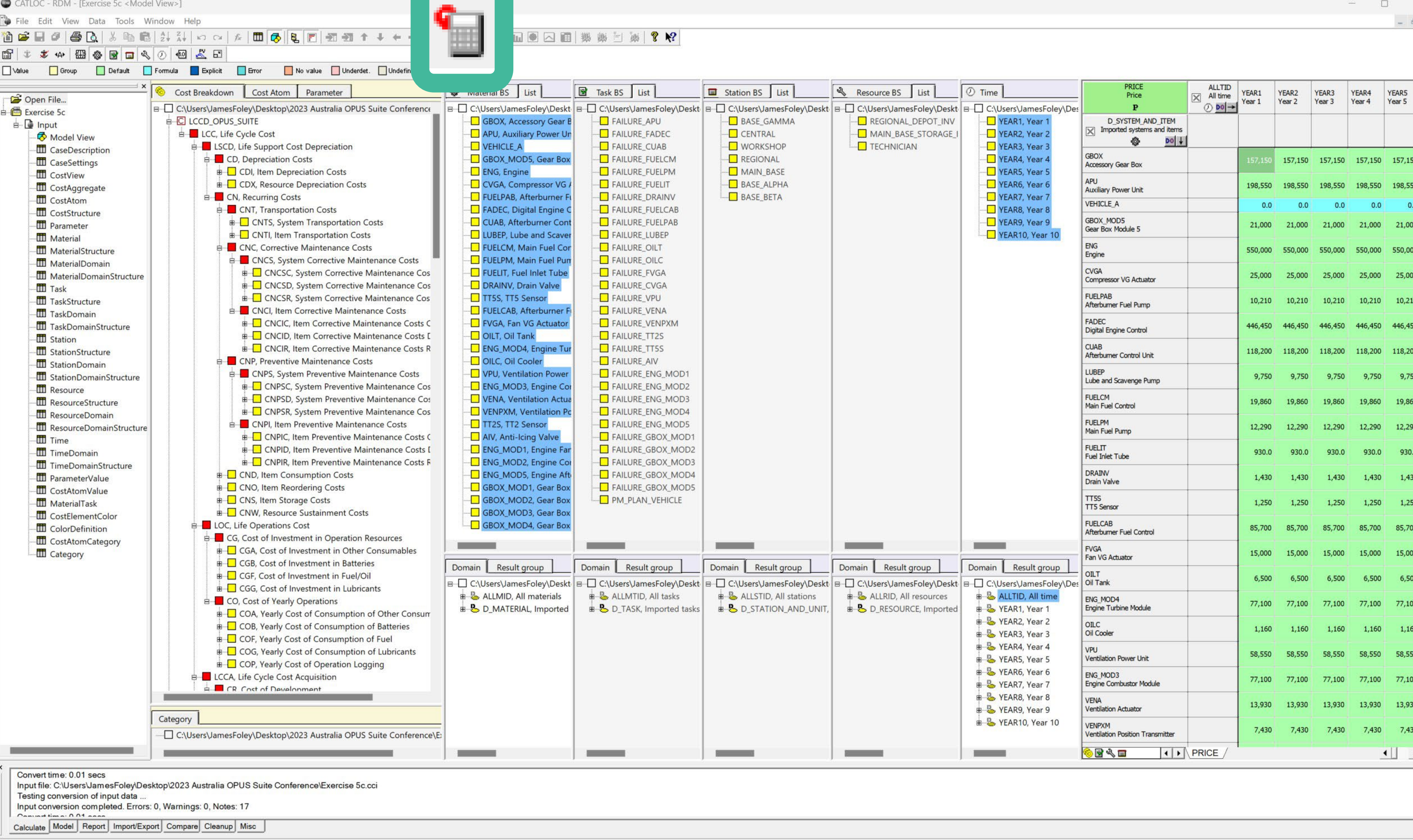
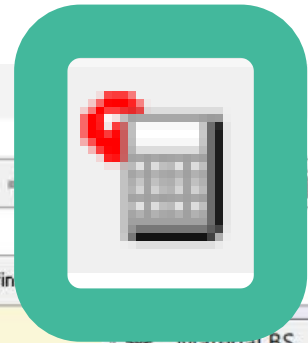
- Calculated in real-time
- Cells/ fields can be manually amended

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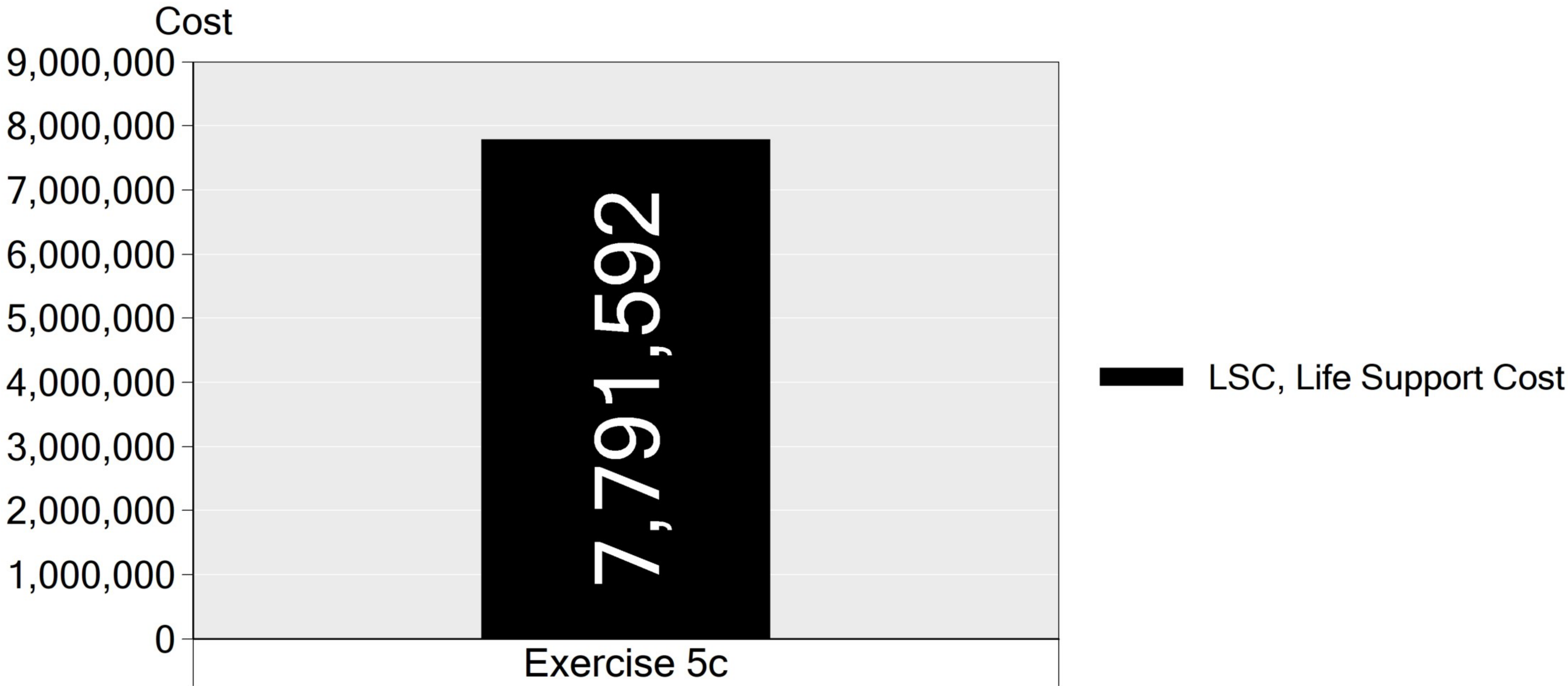
Model View

CNCIR Item Corrective Maintenance Costs Resources		☒ ALLTID All time	YEAR1 Year 1							YEAR2 Year 2	
		☒ D_STATION_AND_UNIT Imported stations and units	BASE_GAMMA	CENTRAL	WORKSHOP	REGIONAL	MAIN_BASE	BASE_ALPHA	BASE_BETA	BASE_GAMMA	CENTRAL
☒ D_ITEM Imported items	☒ D_CM Imported corrective maintenance tasks										
GBOX Accessory Gear Box	FAILURE_GBOX_MOD1		0.0	222.9	0.0	0.0	0.0	0.0	0.0	0.0	222.9
	FAILURE_GBOX_MOD2		0.0	44.55	0.0	0.0	0.0	0.0	0.0	0.0	44.55
	FAILURE_GBOX_MOD3		0.0	222.9	0.0	0.0	0.0	0.0	0.0	0.0	222.9
	FAILURE_GBOX_MOD4		0.0	401.2	0.0	0.0	0.0	0.0	0.0	0.0	401.2
	FAILURE_GBOX_MOD5		0.0	222.9	0.0	0.0	0.0	0.0	0.0	0.0	222.9
APU Auxiliary Power Unit	FAILURE_APU		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GBOX_MOD5 Gear Box Module 5	FAILURE_GBOX_MOD5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ENG Engine	FAILURE_ENG_MOD1		0.0	886.6	0.0	0.0	0.0	0.0	0.0	0.0	886.6
	FAILURE_ENG_MOD2		0.0	365.1	0.0	0.0	0.0	0.0	0.0	0.0	365.1
	FAILURE_ENG_MOD3		0.0	449.2	0.0	0.0	0.0	0.0	0.0	0.0	449.2
	FAILURE_ENG_MOD4		0.0	1,146	0.0	0.0	0.0	0.0	0.0	0.0	1,146
	FAILURE_ENG_MOD5		0.0	1,946	0.0	0.0	0.0	0.0	0.0	0.0	1,946
CVGA Compressor VG Actuator	FAILURE_CVGA		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FUELPAB Afterburner Fuel Pump	FAILURE_FUELPAB		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FADEC Digital Engine Control	FAILURE_FADEC		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CUAB Afterburner Control Unit	FAILURE_CUAB		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Model View

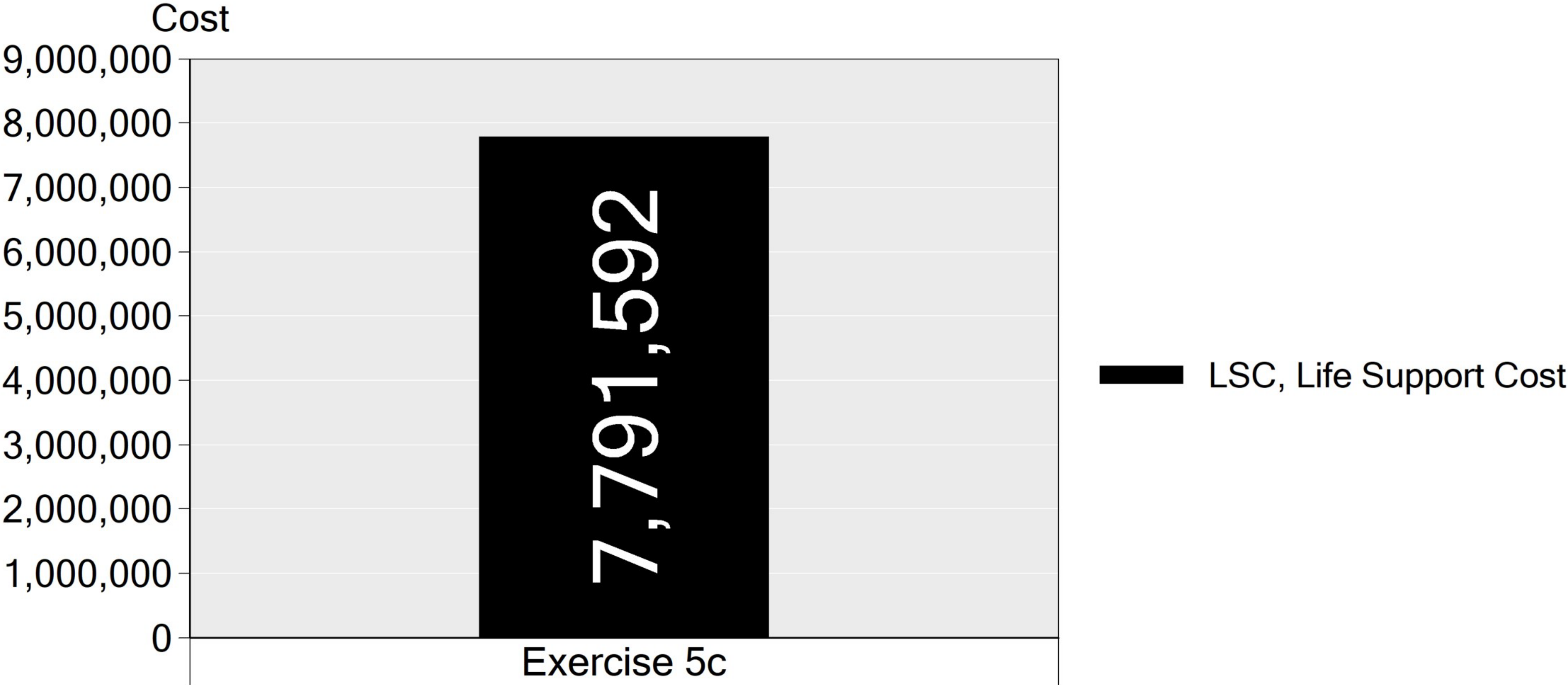


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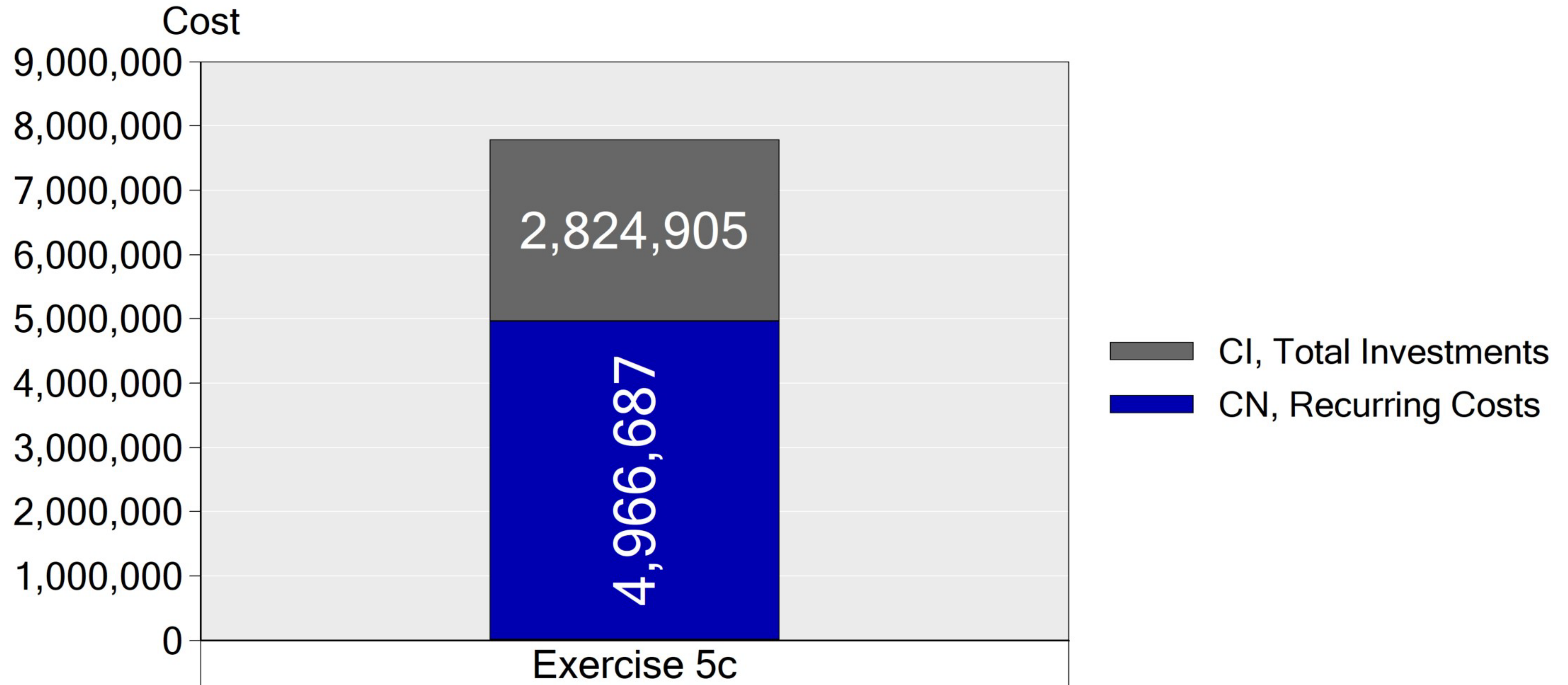


Result Window Features

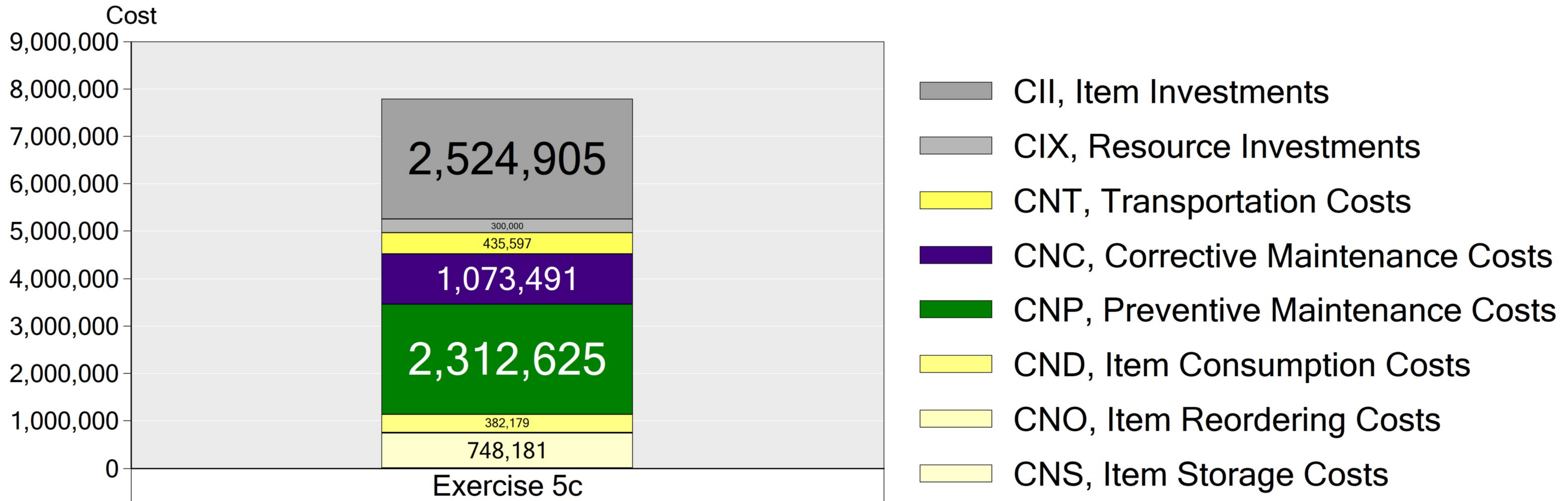
1st Level



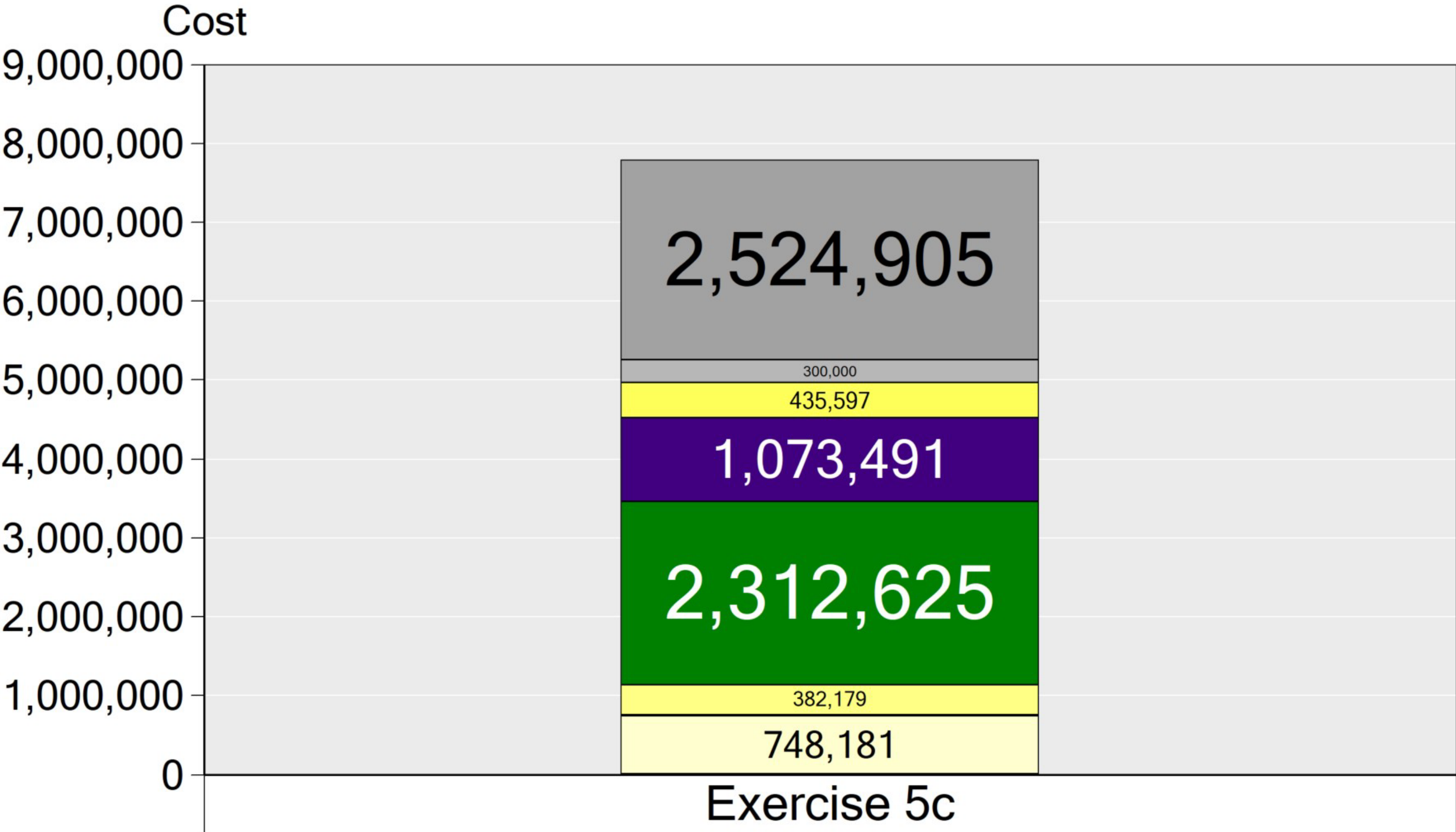
2nd Level



3rd Level

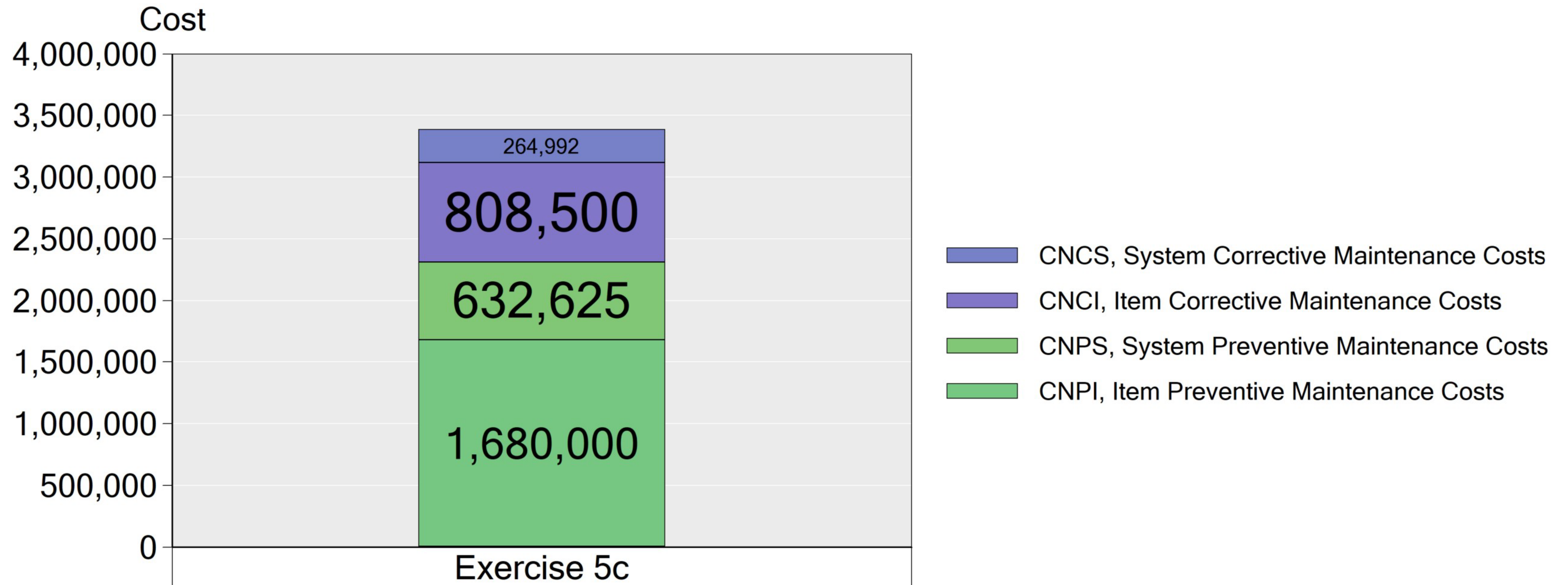


3rd Level

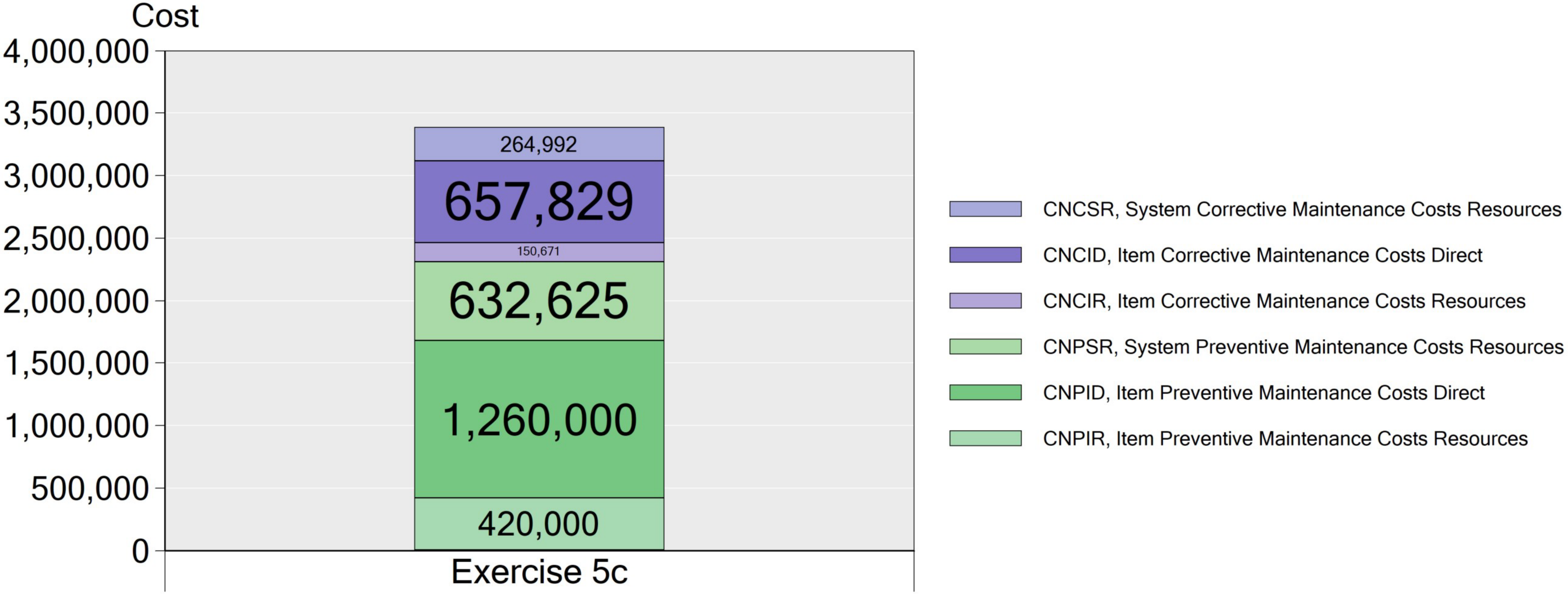


- CII, Item Investments
- CIX, Resource Investments
- CNT, Transportation Costs
- CNC, Corrective Maintenance Costs
- CNP, Preventive Maintenance Costs
- CND, Item Consumption Costs
- CNO, Item Reordering Costs
- CNS, Item Storage Costs

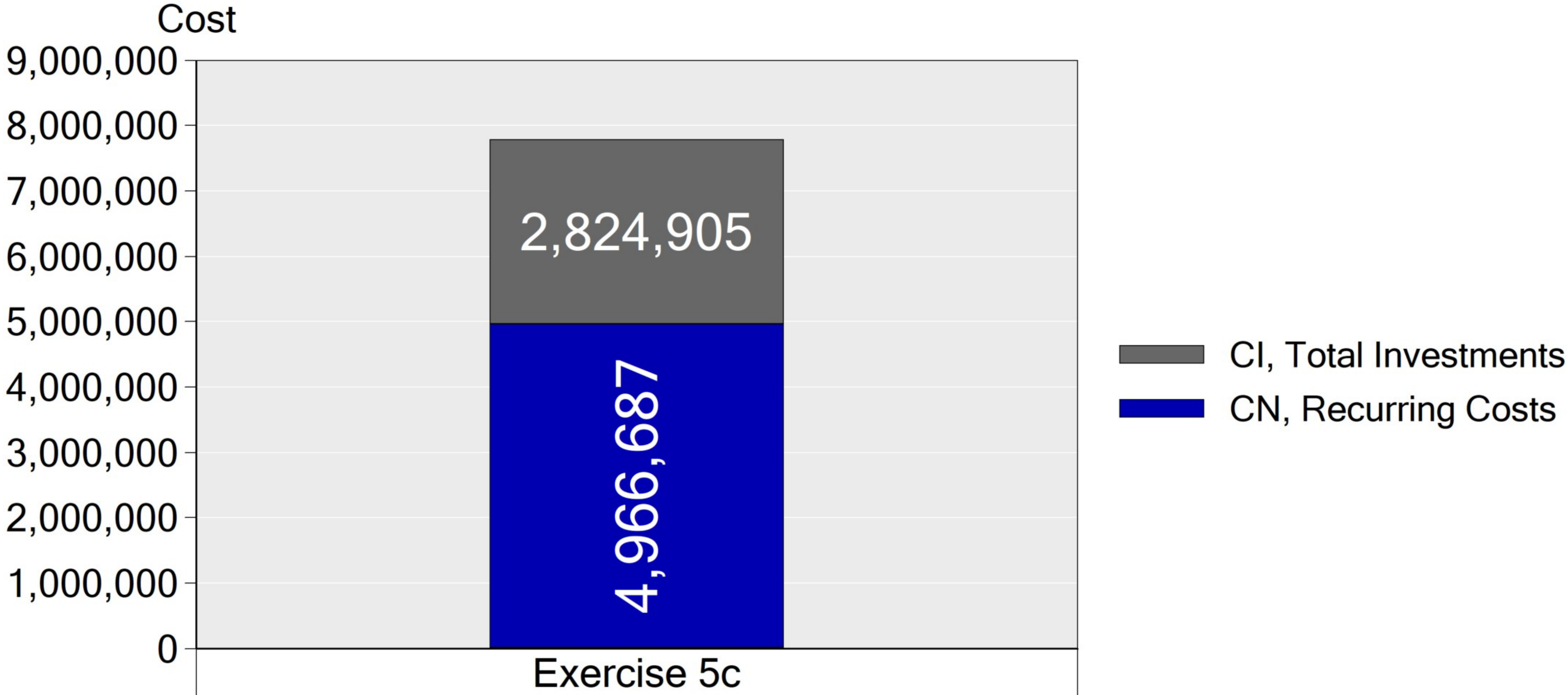
4th Level – User Selected Cost Atoms Only



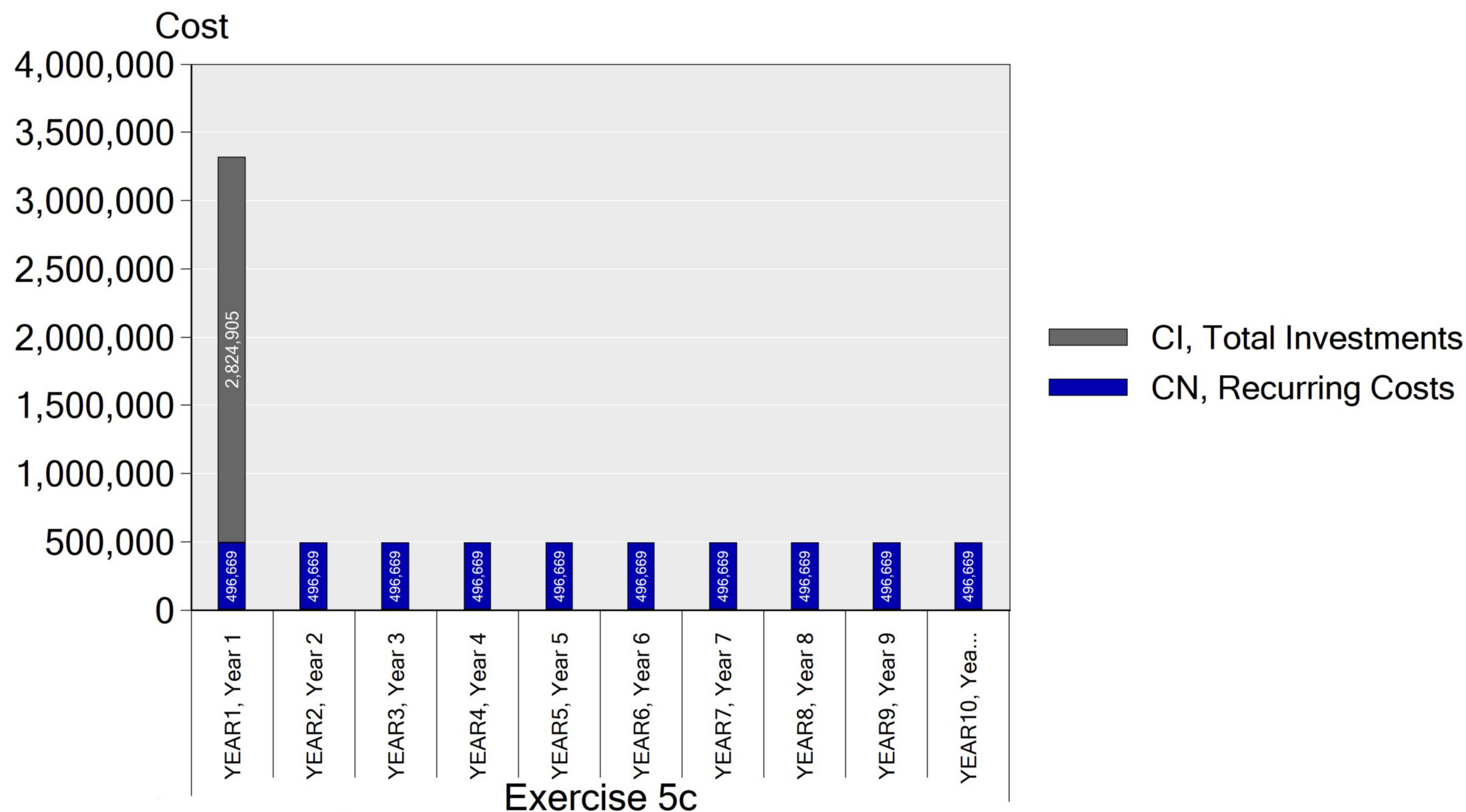
5th Level – User Selected Cost Atoms Only



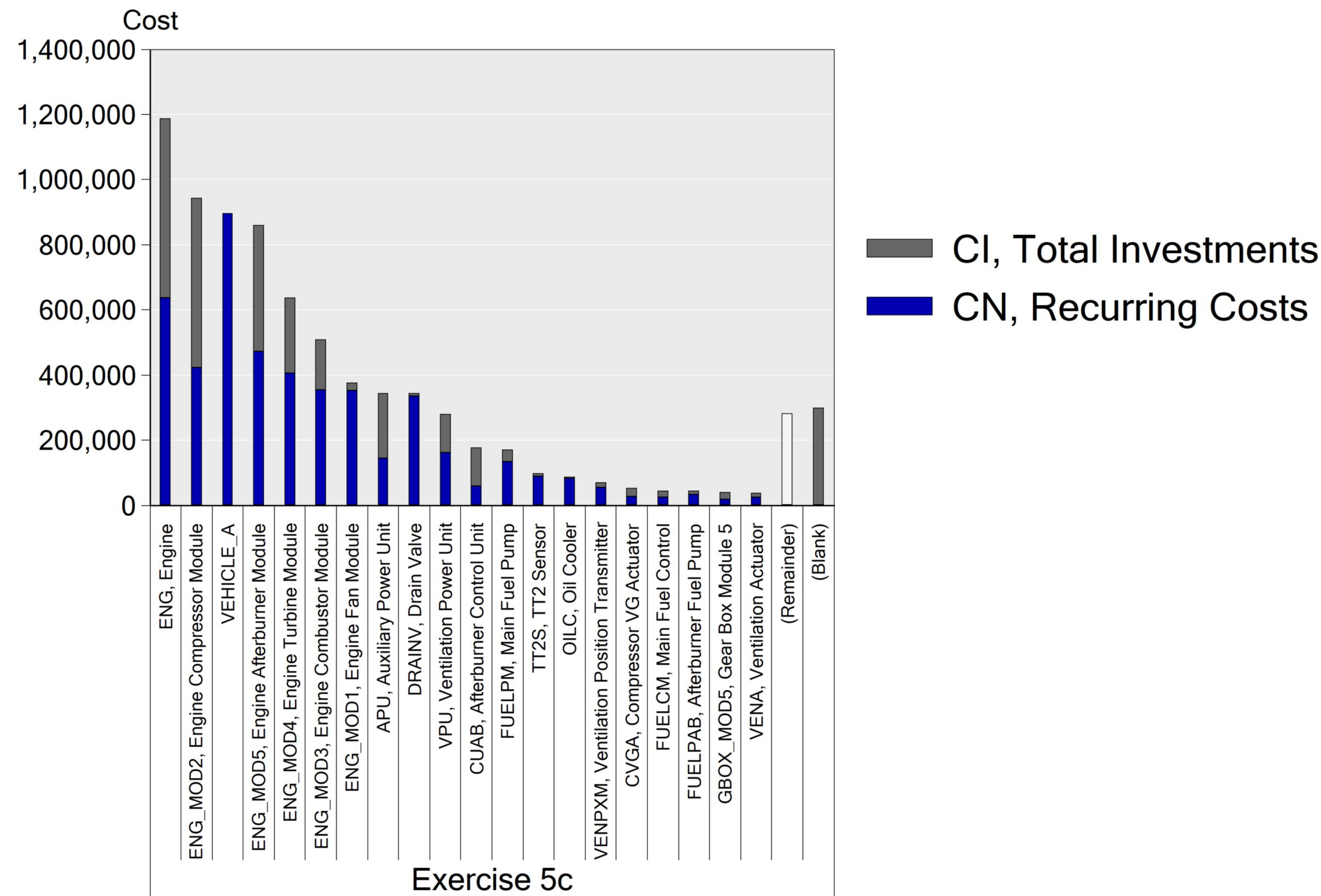
2nd Level



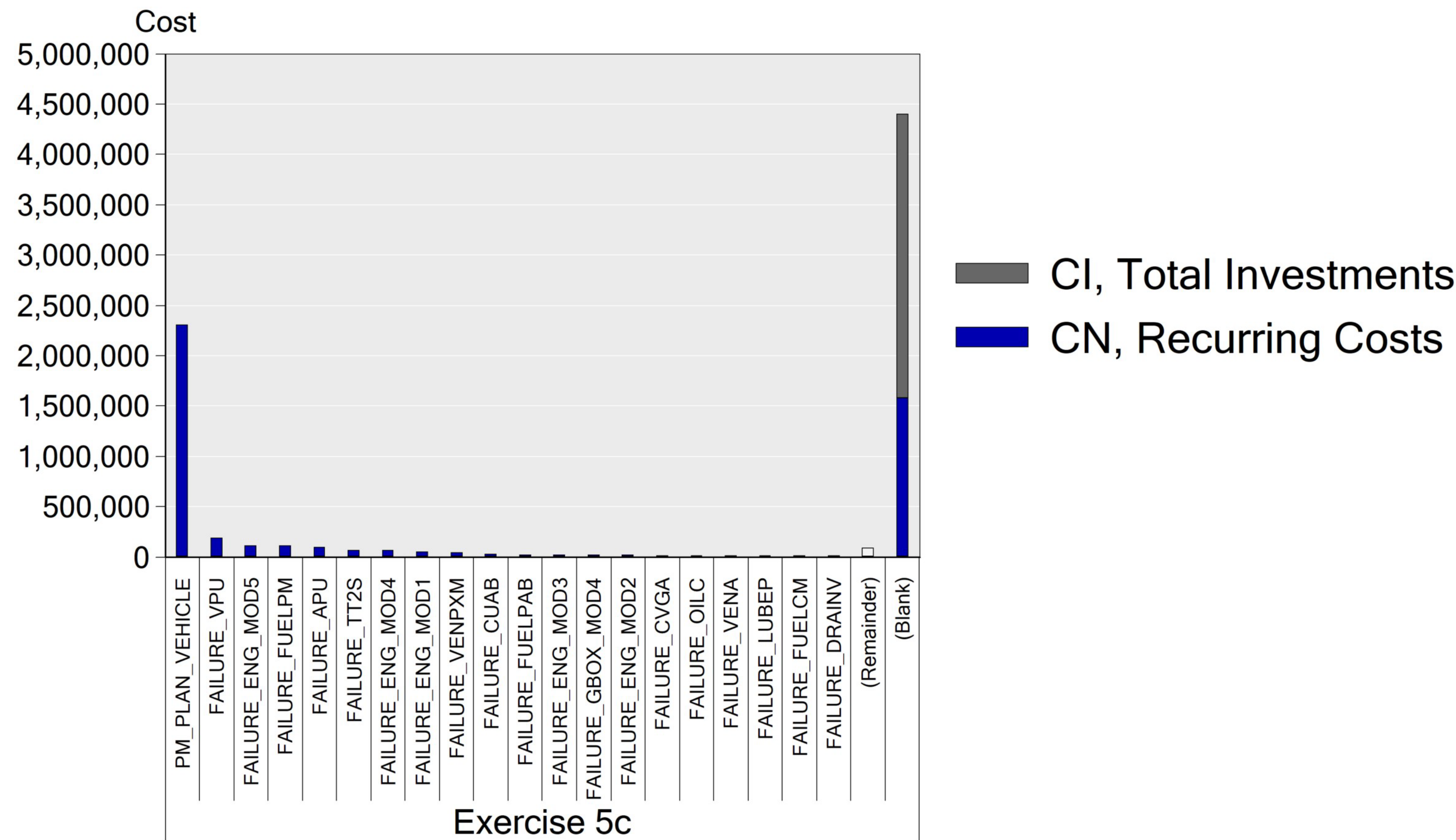
Time Dimension



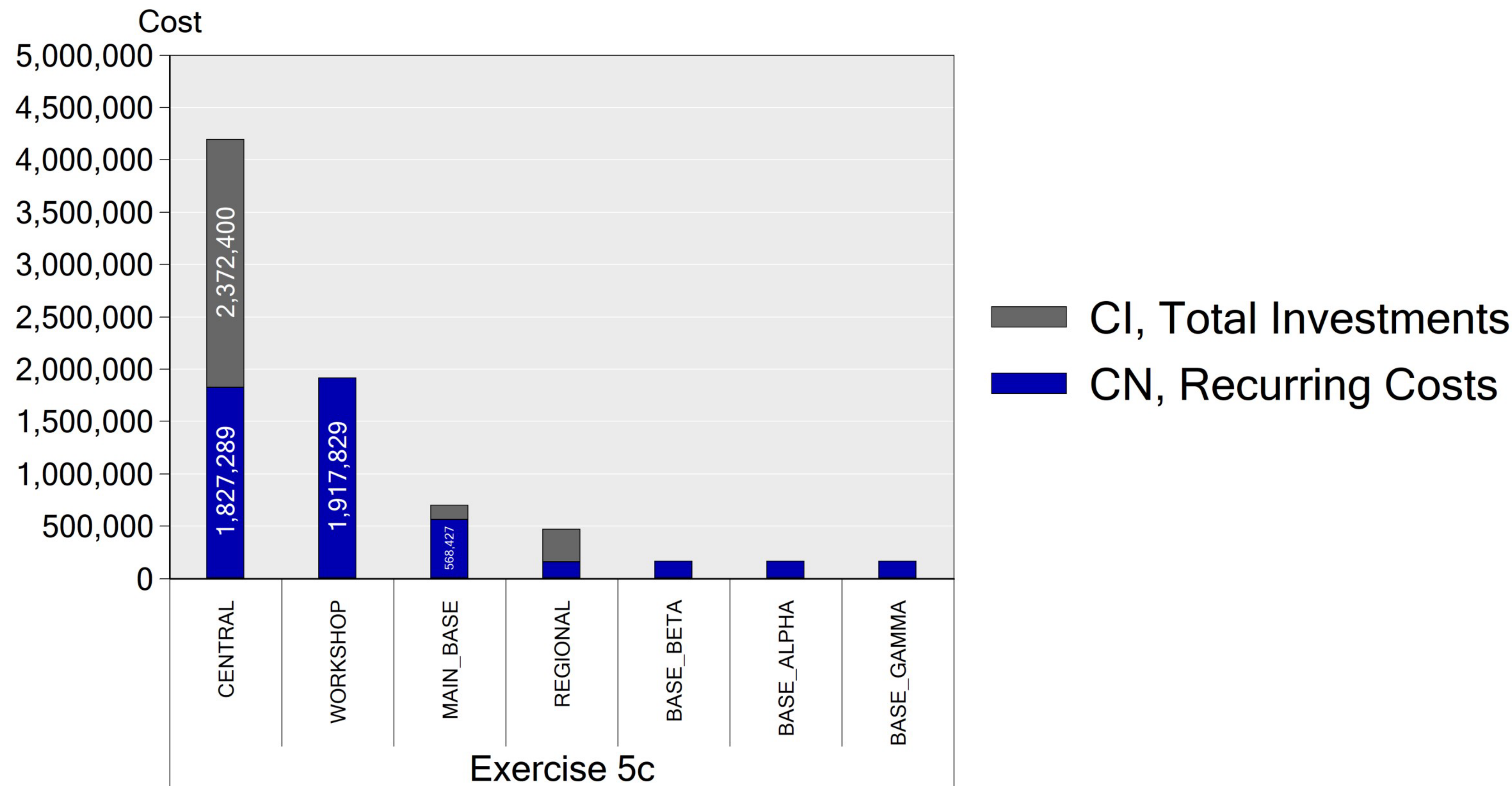
Material Dimension



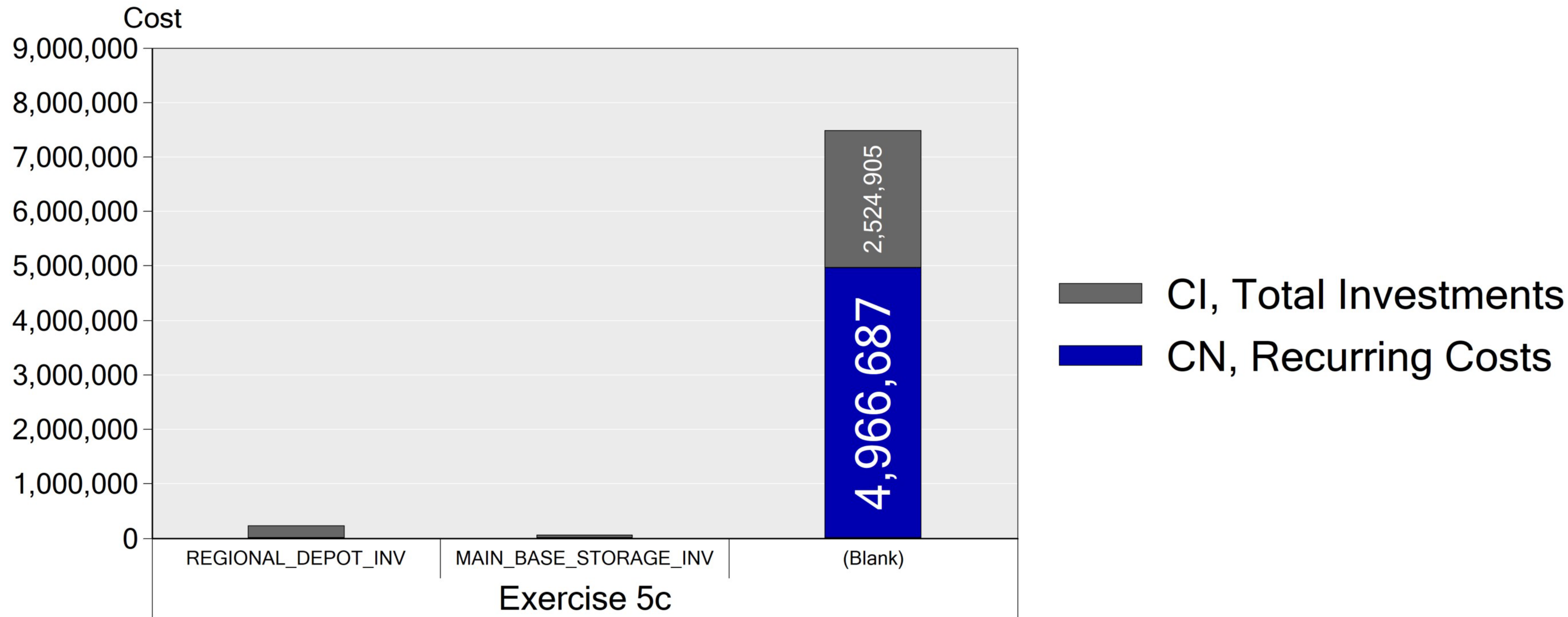
Task Dimension



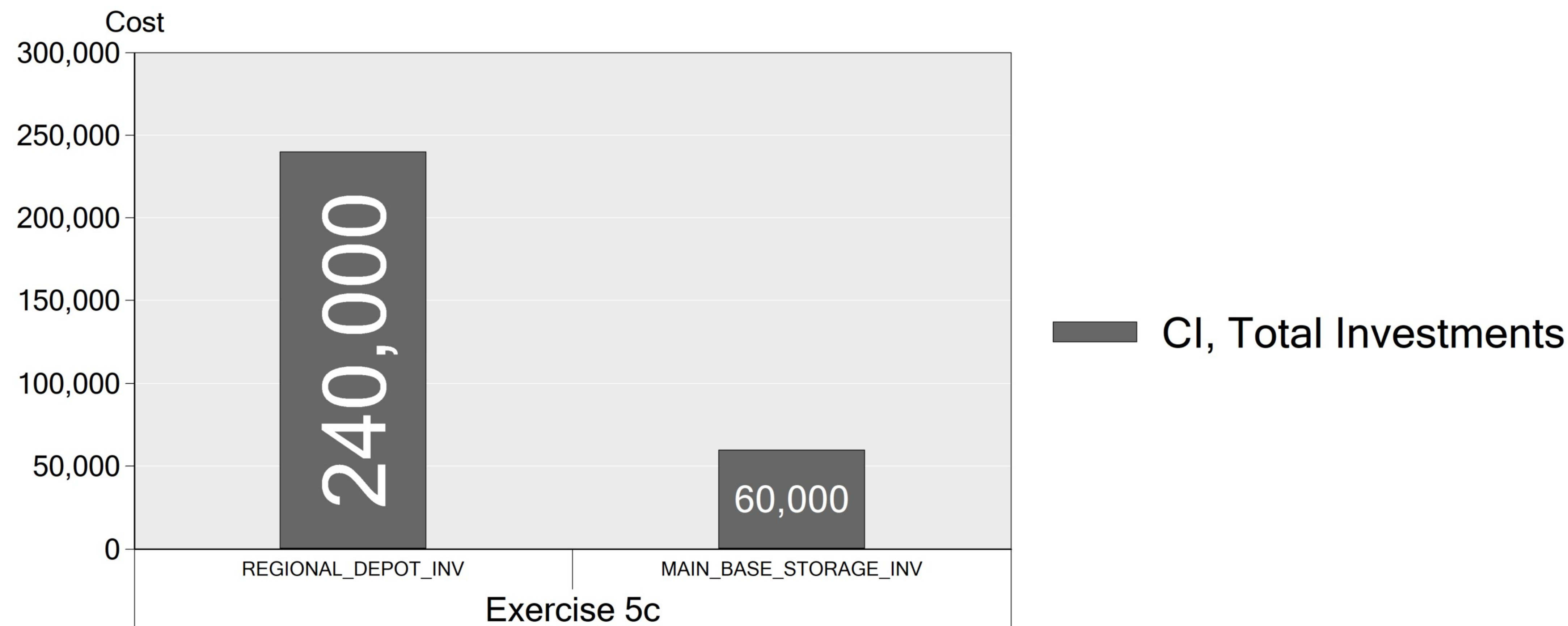
Station Dimension



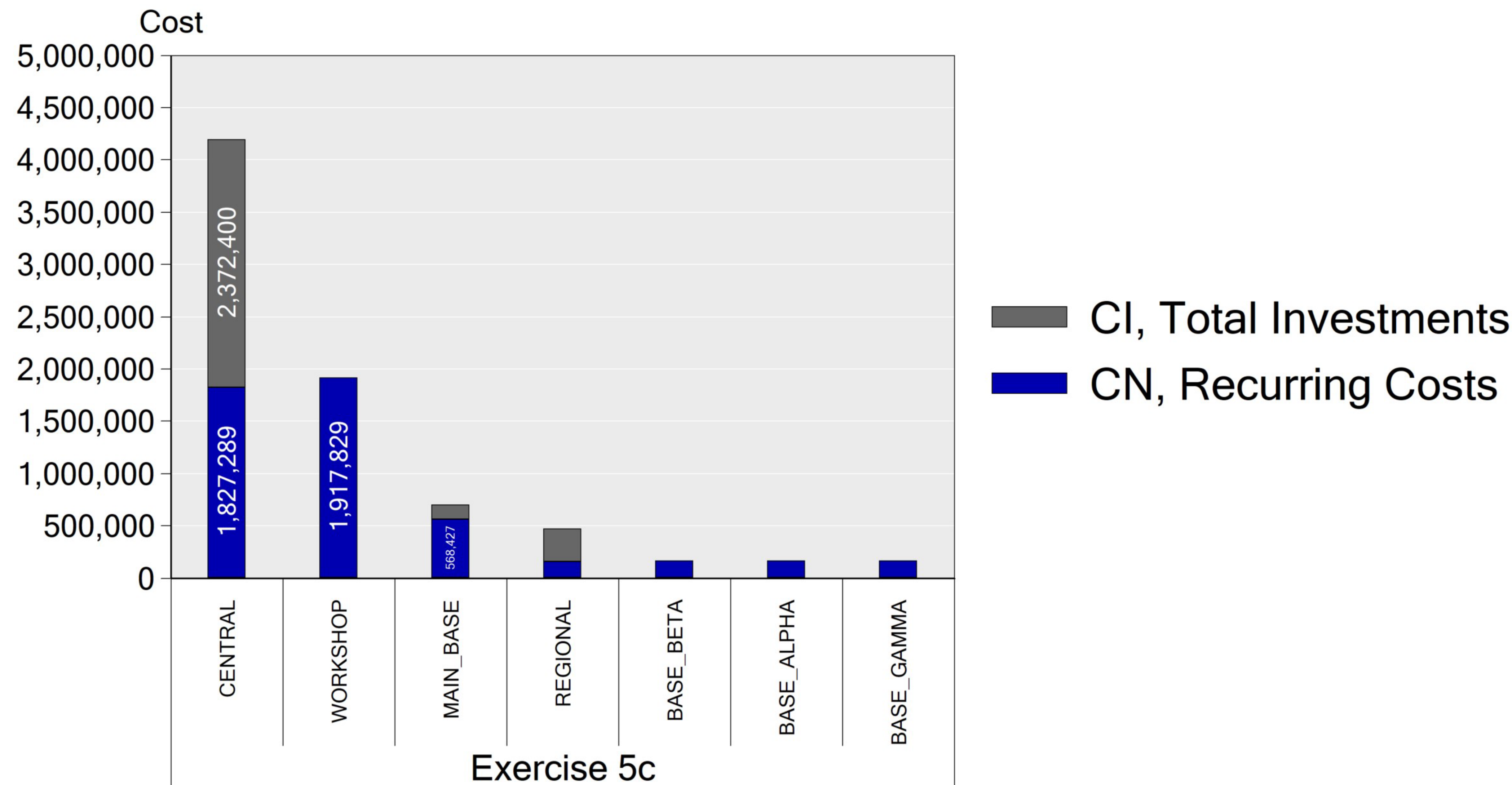
Resource Dimension



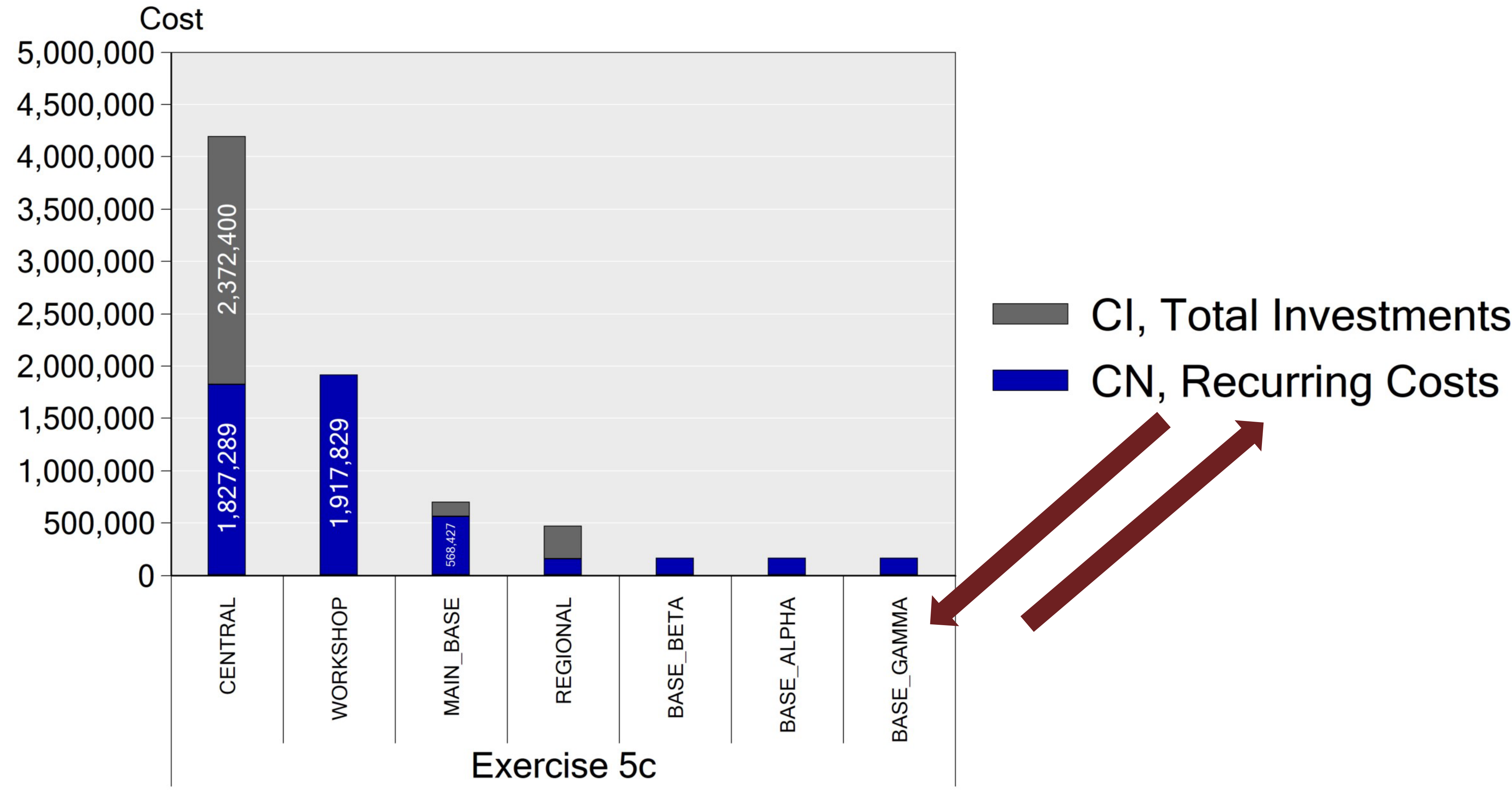
Resource Dimension



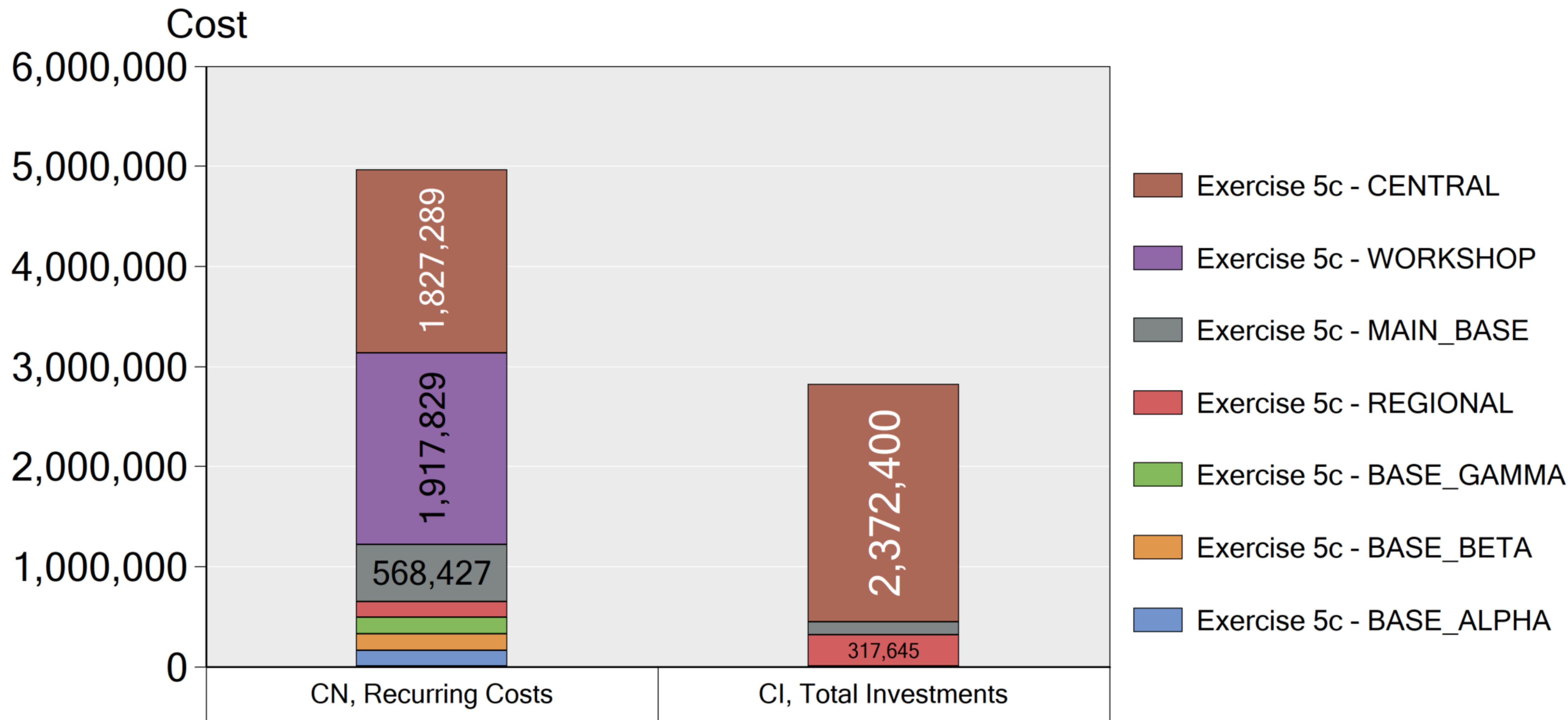
‘Case’ on X-axis & Cost on Y-axis



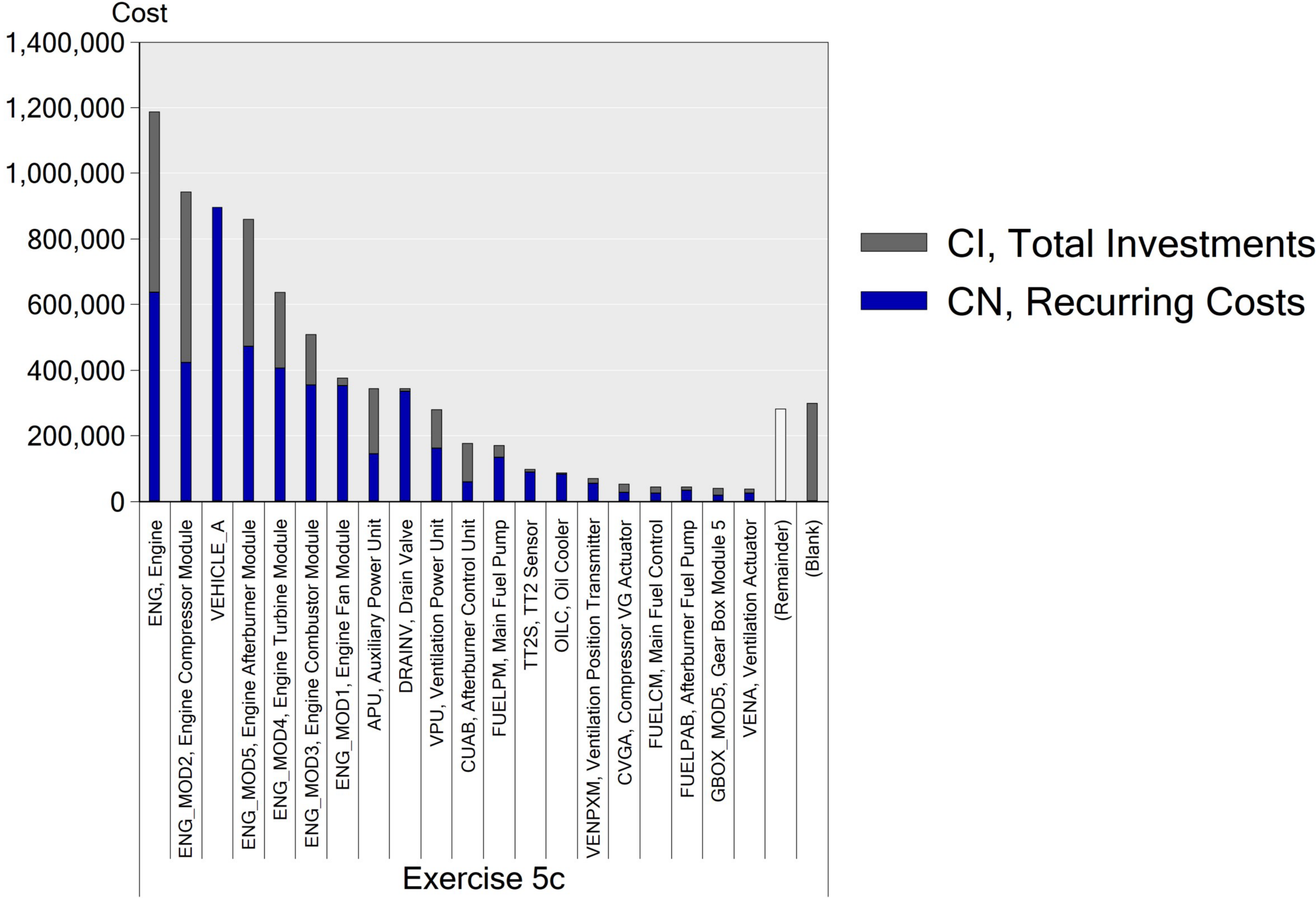
'Case' on X-axis & Cost on Y-axis



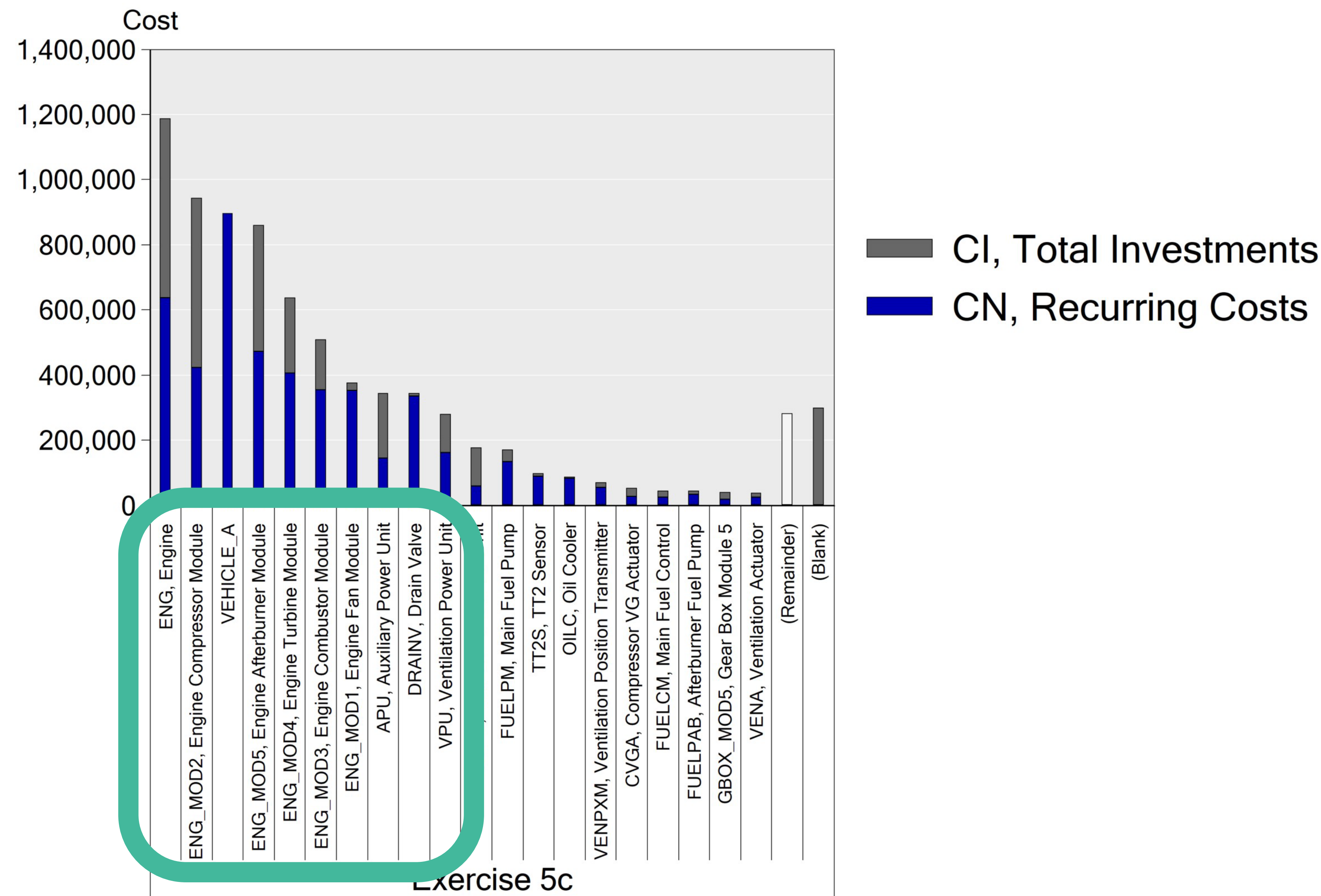
Cost on X-axis & 'Case' on Y-axis



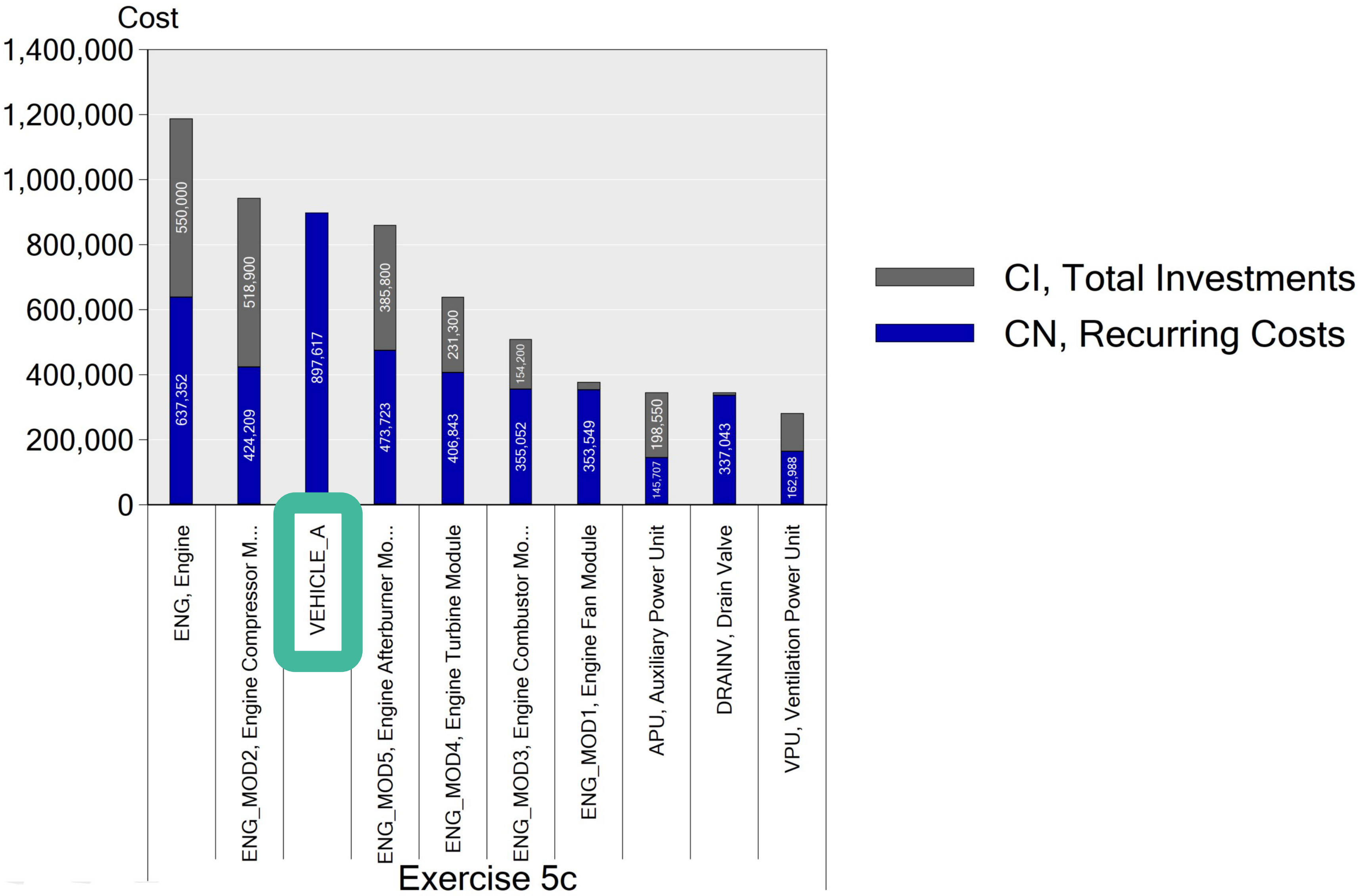
Cost Driver Identification



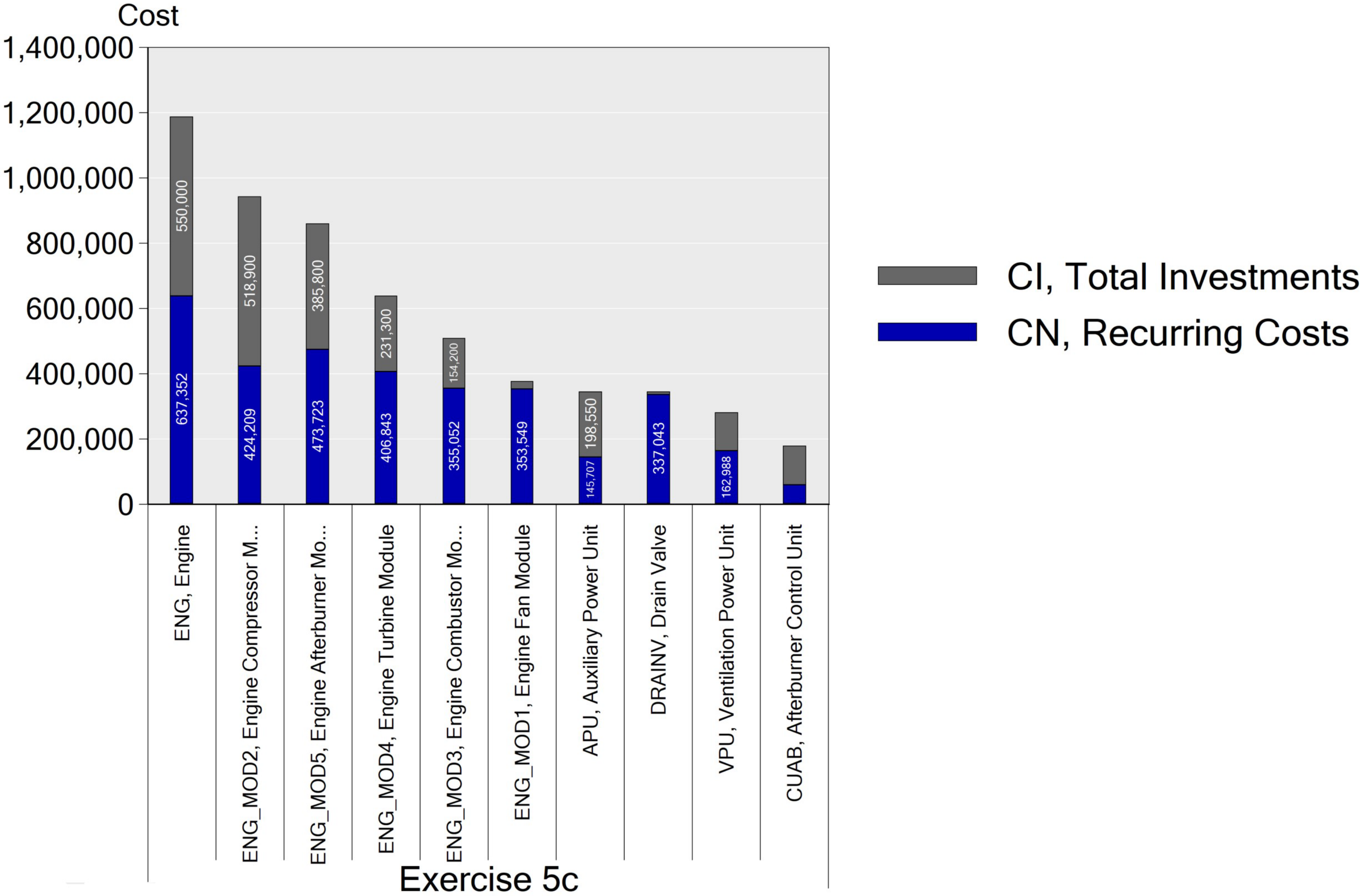
Cost Driver Identification



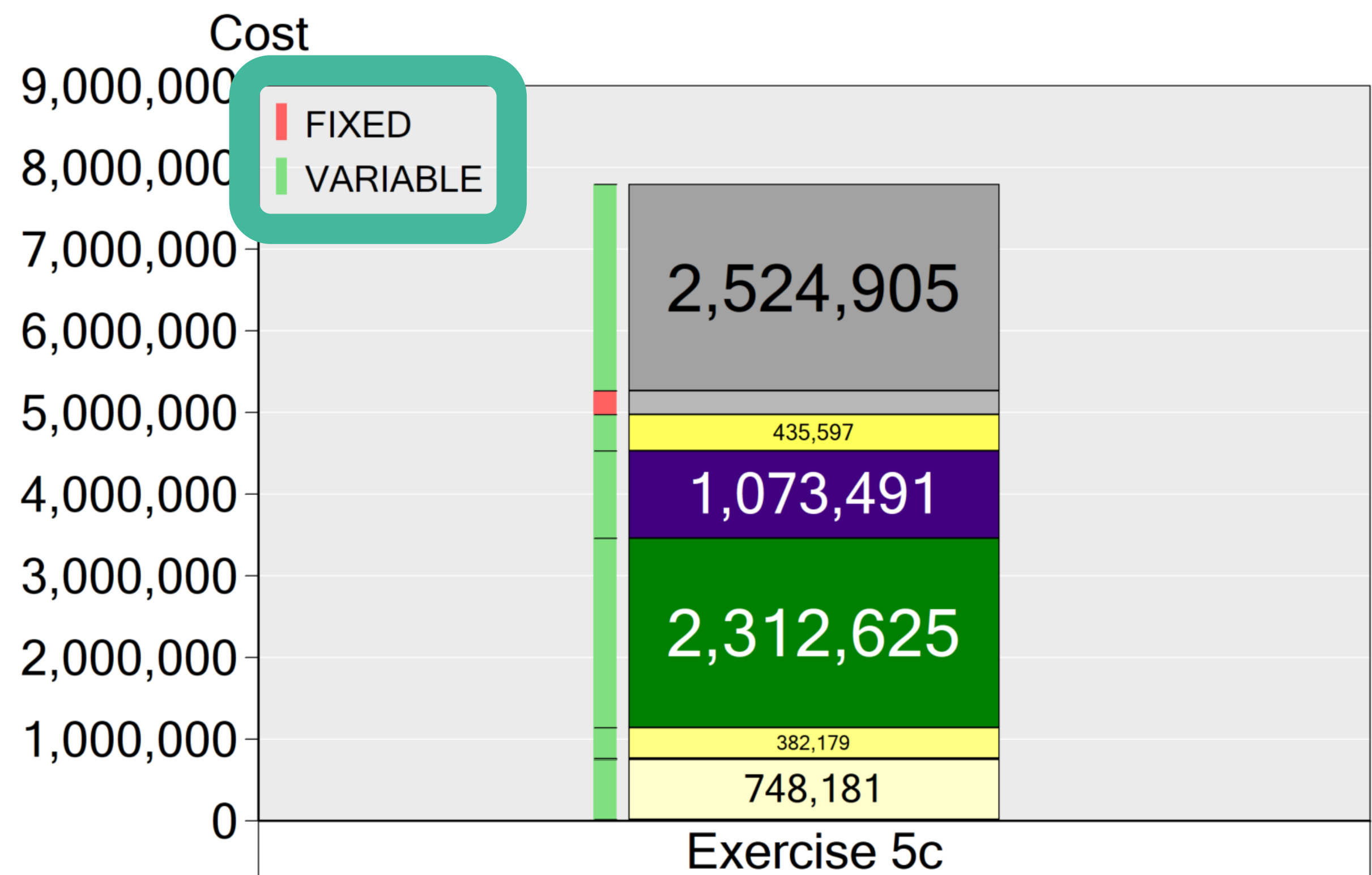
Cost Driver Identification



Cost Driver Identification

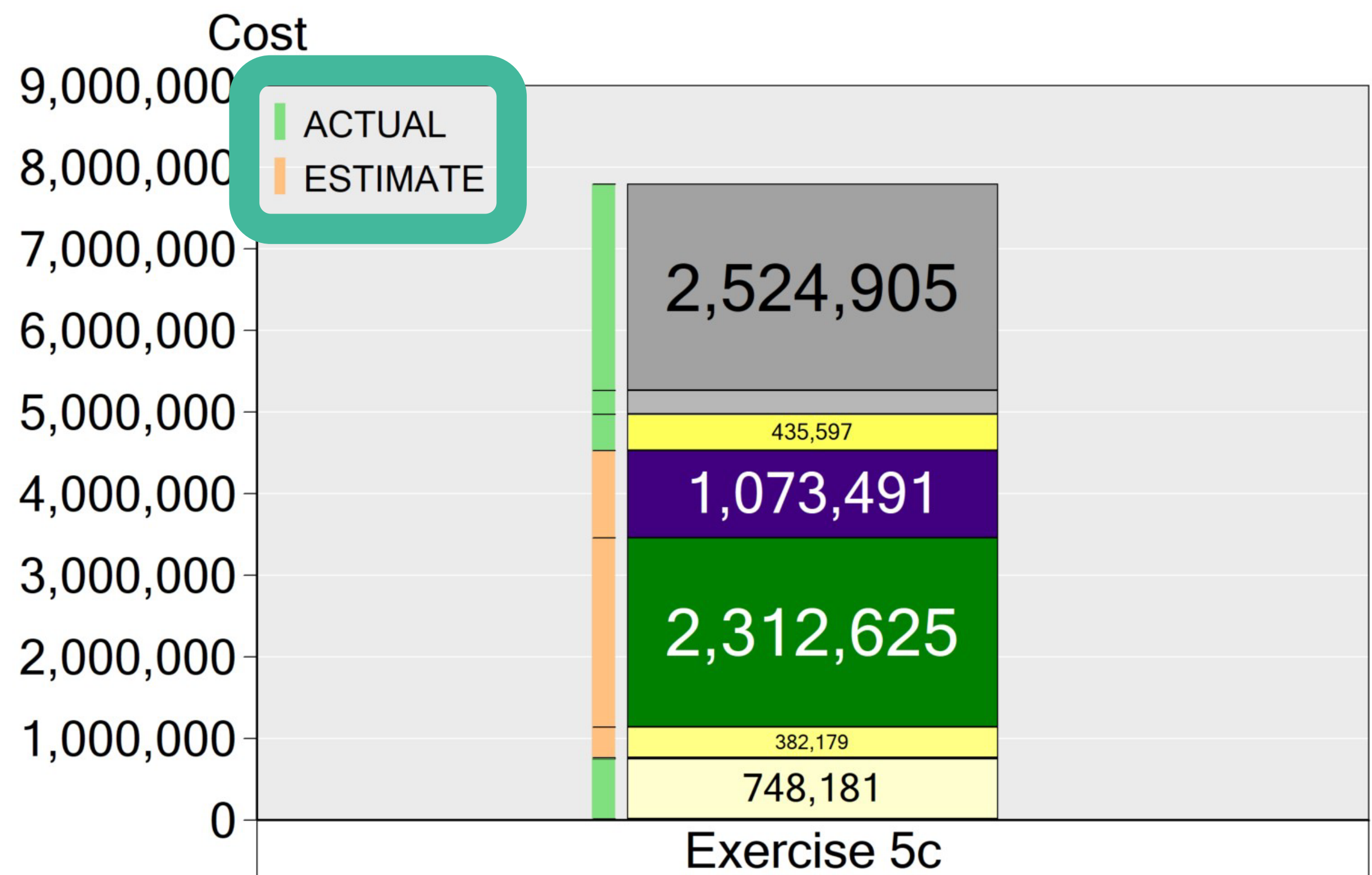


Cost Categorisation



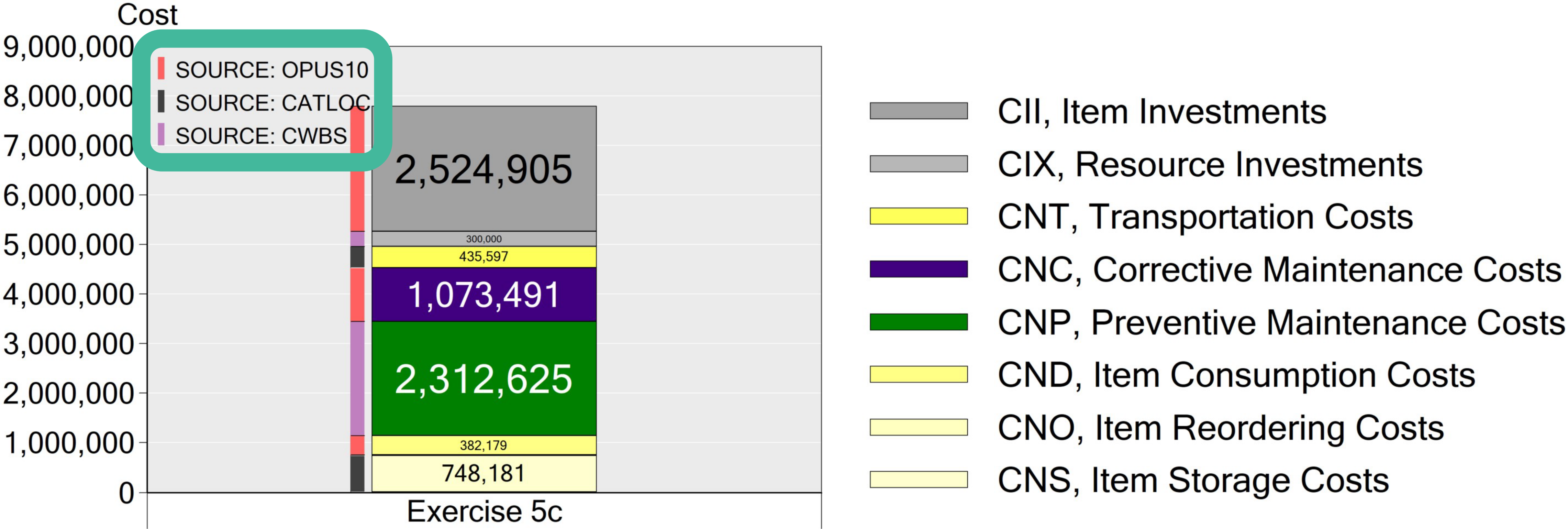
- CII, Item Investments
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Cost Categorisation



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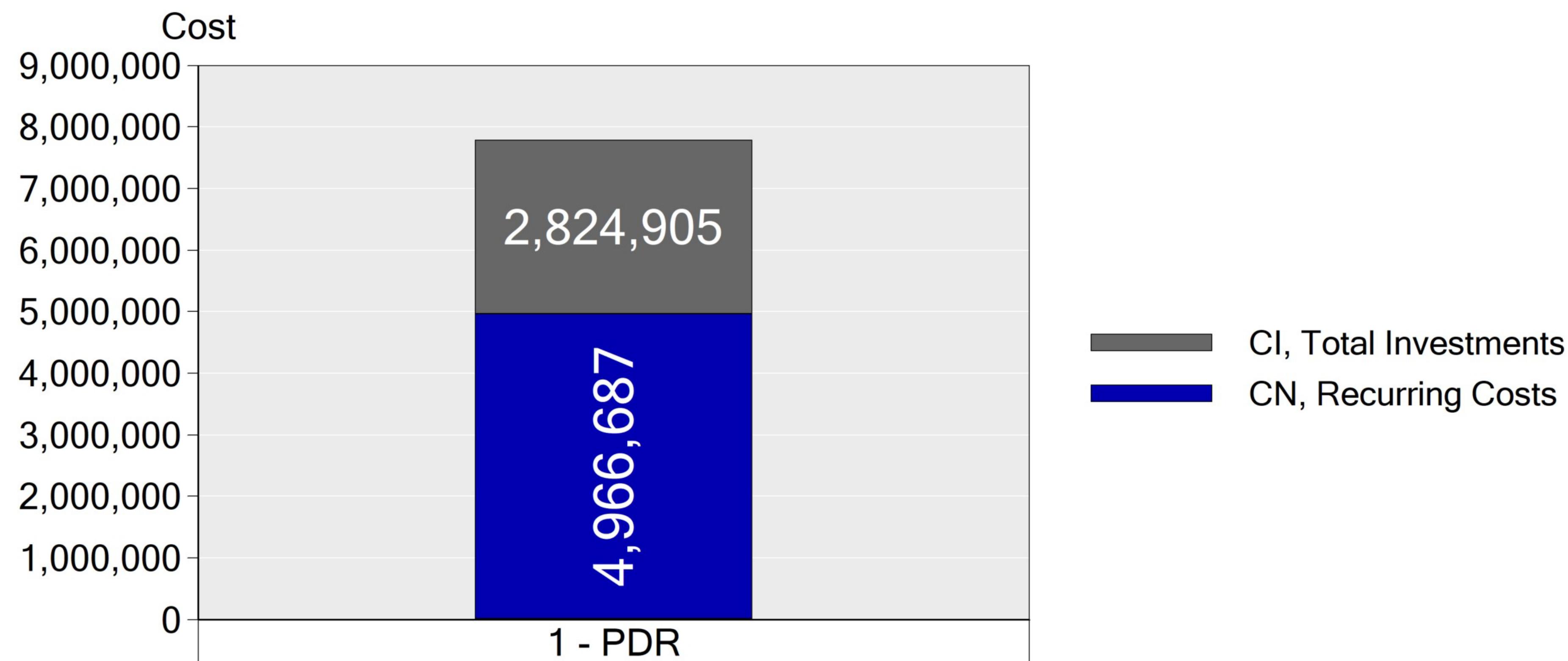
Cost Categorisation



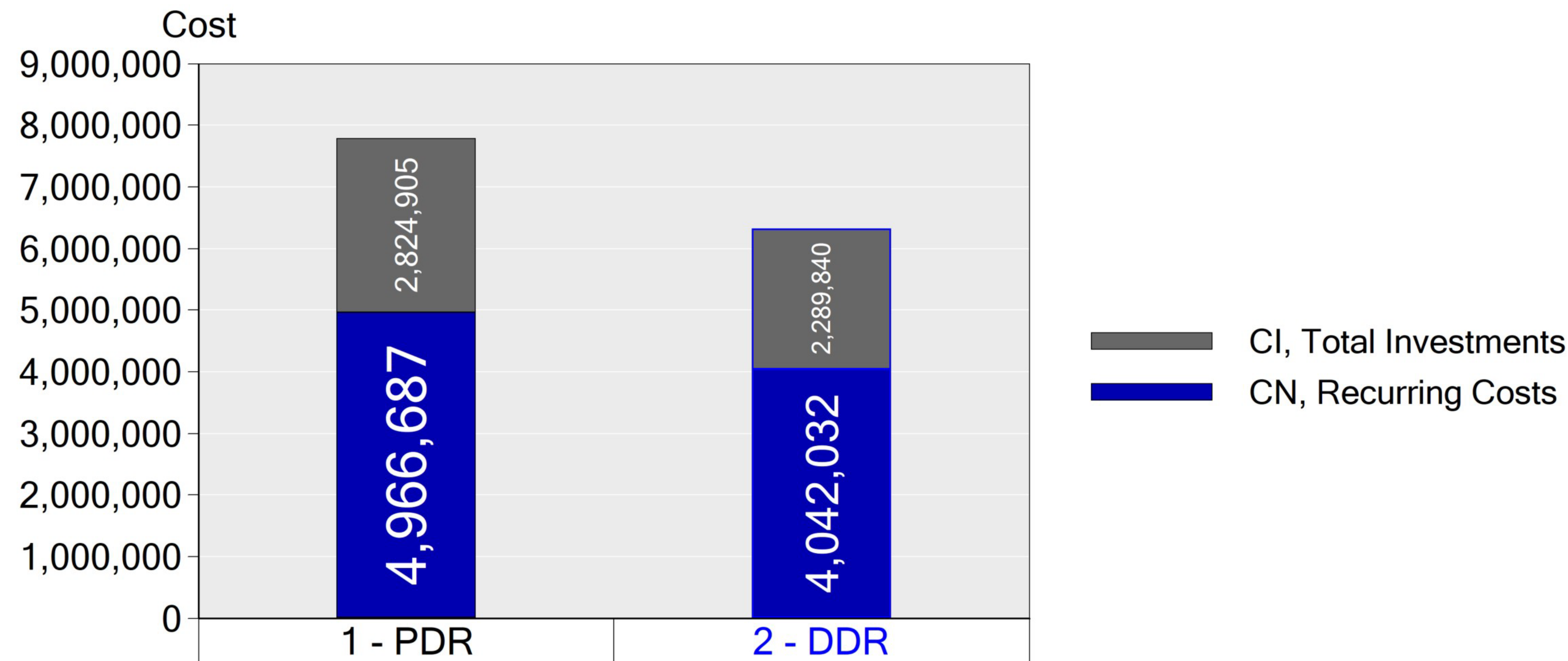
Model Comparison

- ACQ Trade Studies:
 - Mission System/ Support System design alternatives
 - BoI/ BoP alternatives
- SUP Trade Studies:
 - Current Design or Situation vs Potential Change(s) to Mission System/ Support System/ Operations
- ACQ Mandated System Reviews:
 - PDR vs DDR vs SSDDR vs FA

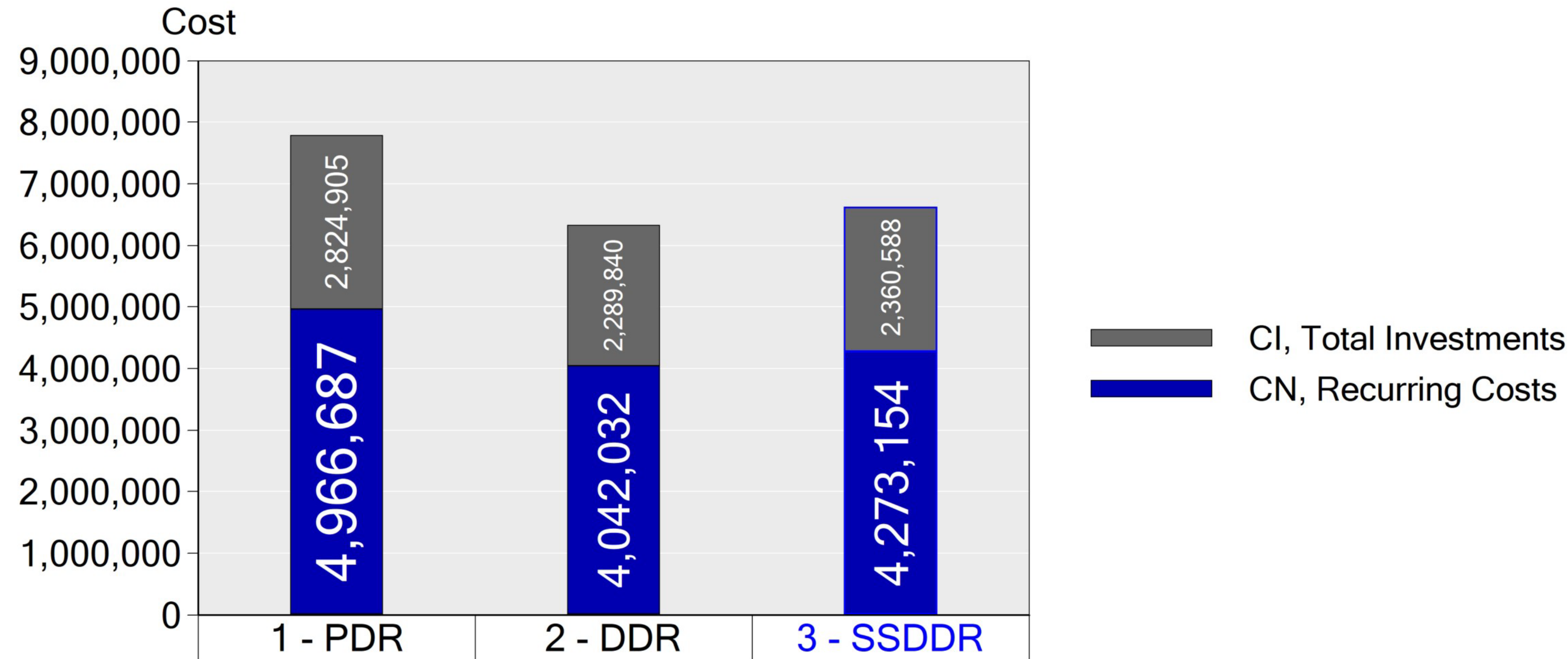
Model Comparison



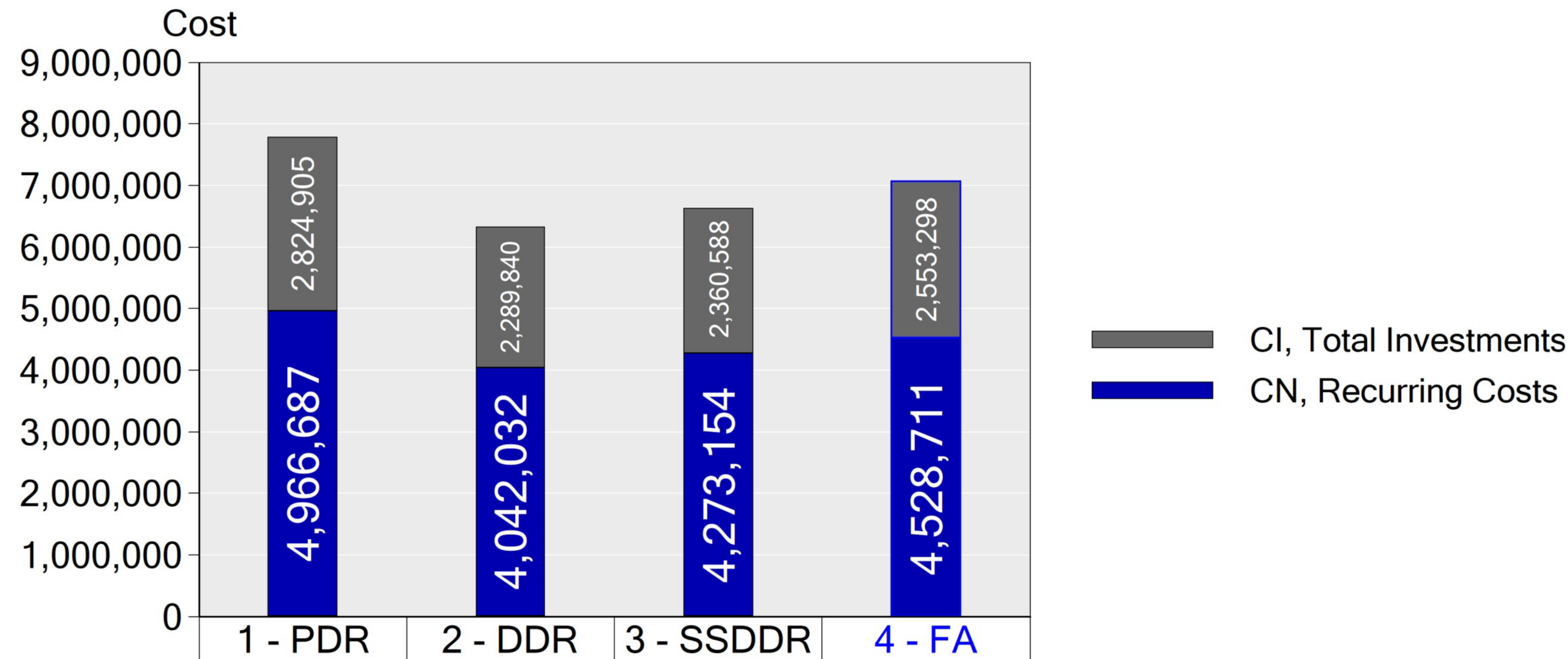
Model Comparison



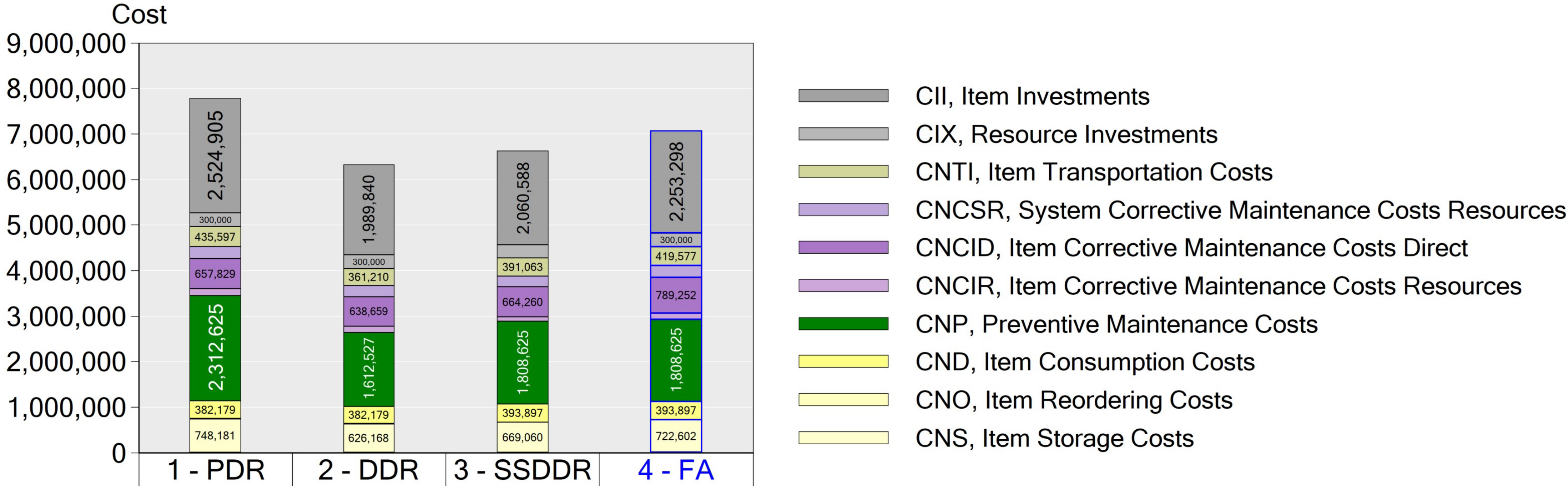
Model Comparison



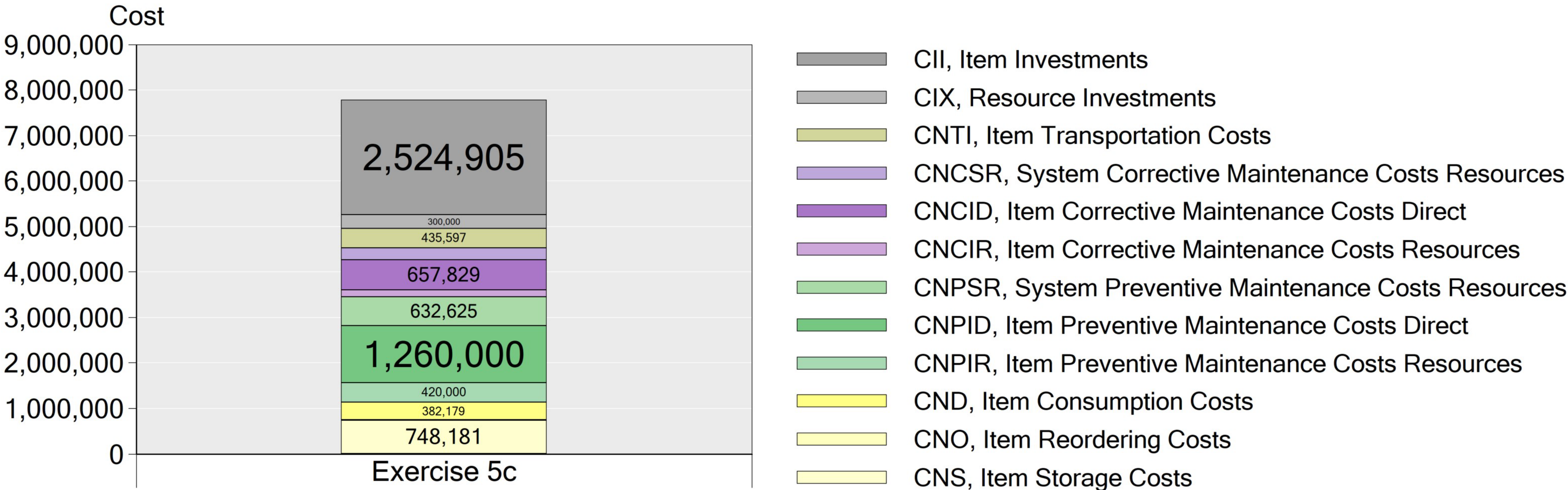
Model Comparison



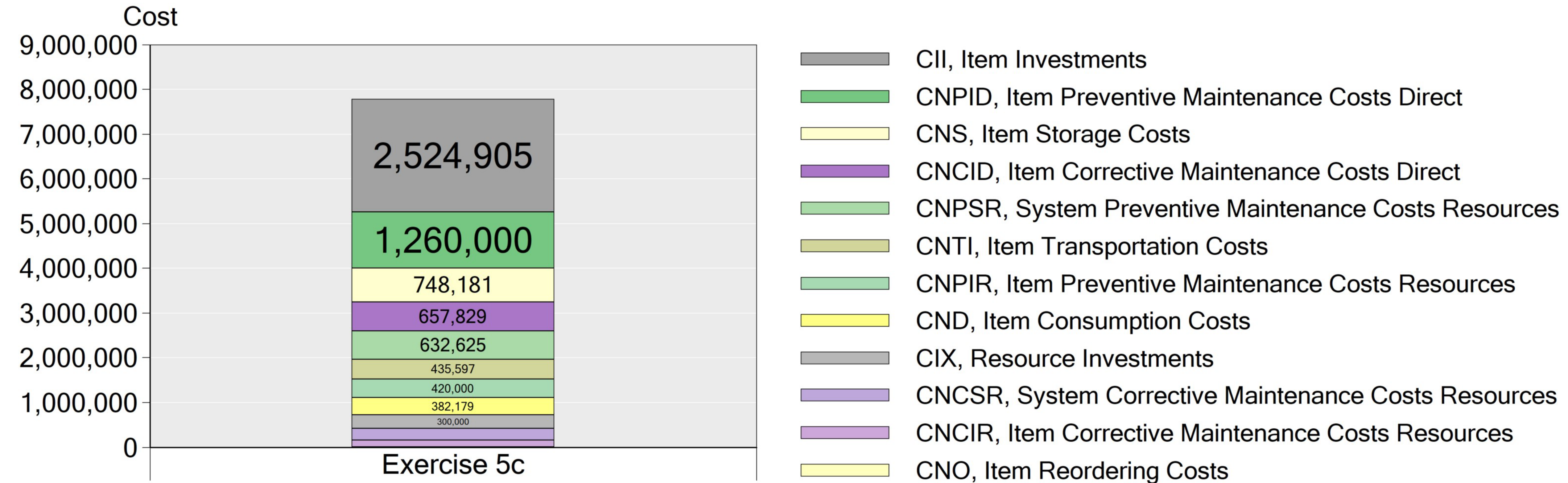
Model Comparison



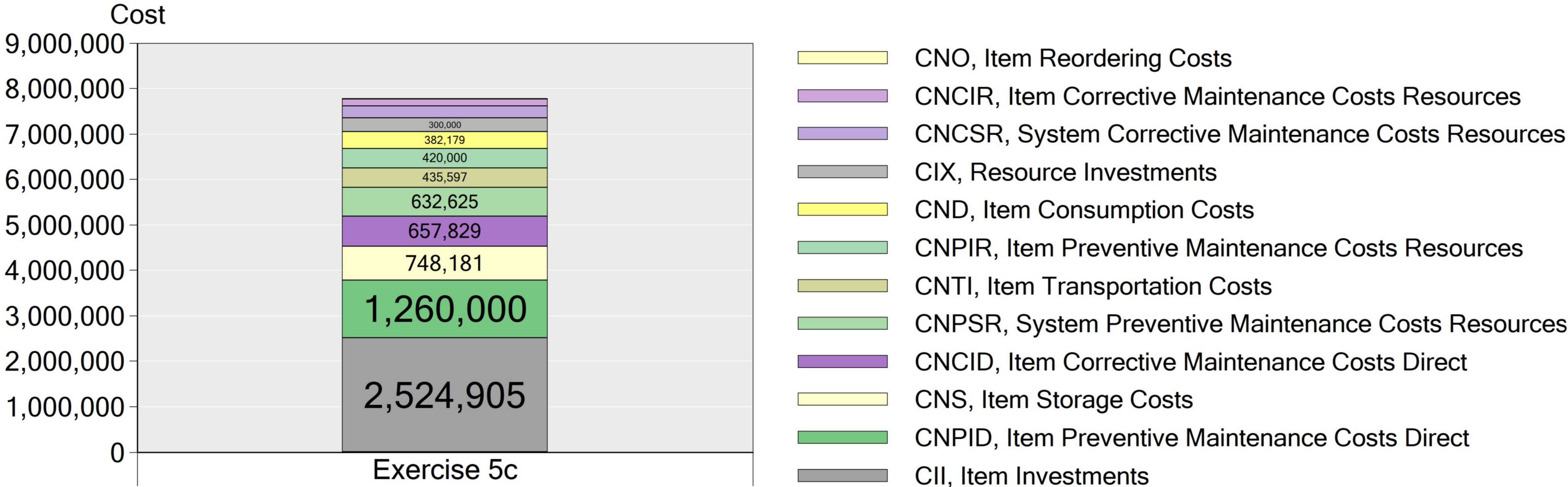
Cost Ranking



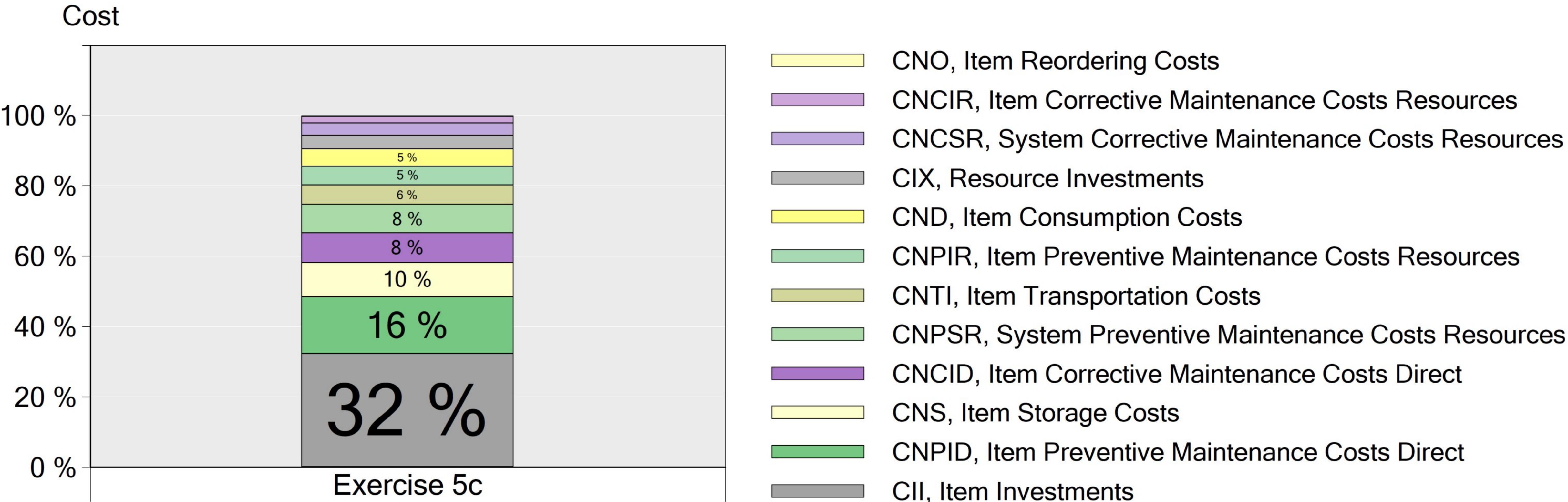
Cost Ranking – Ascending Order



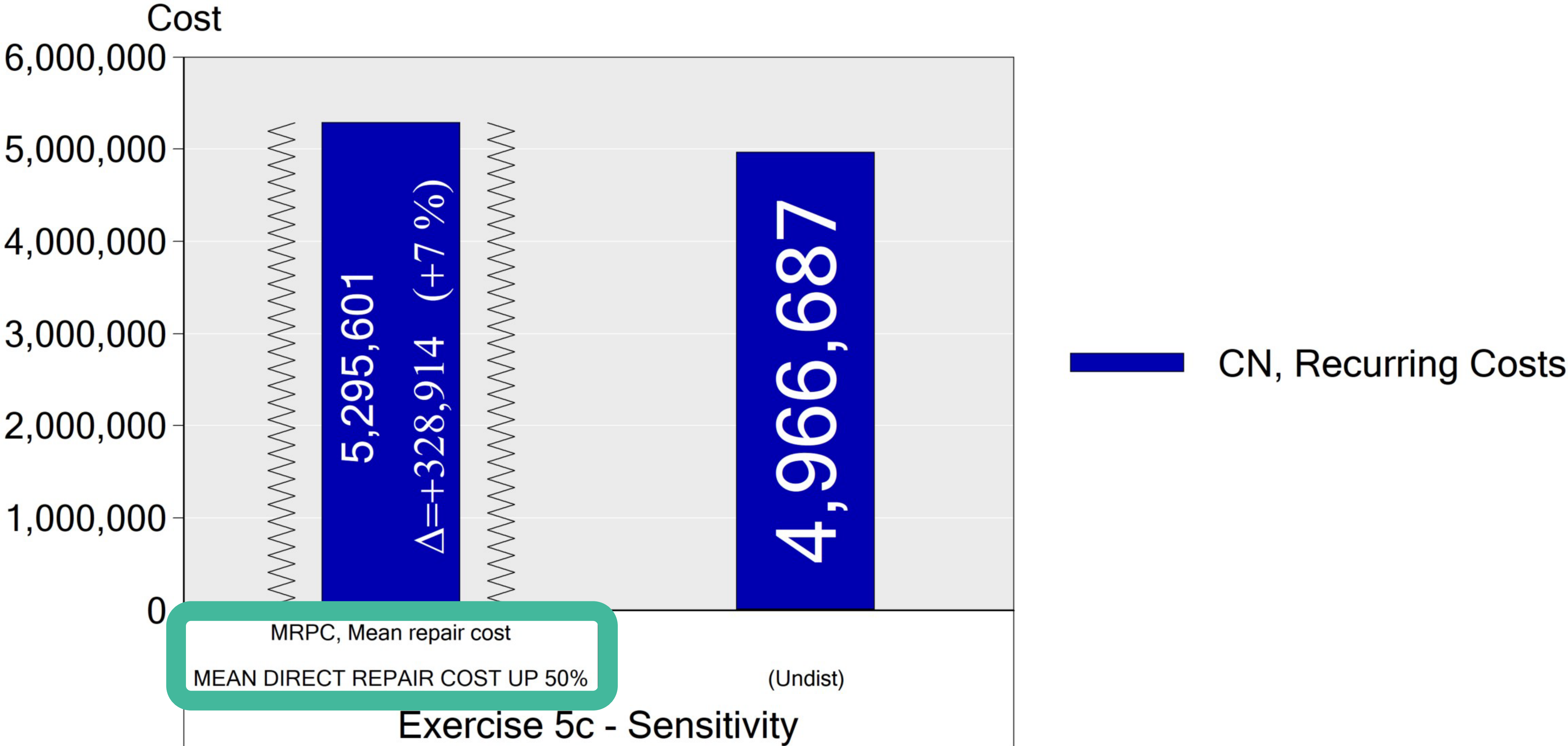
Cost Ranking – Descending Order



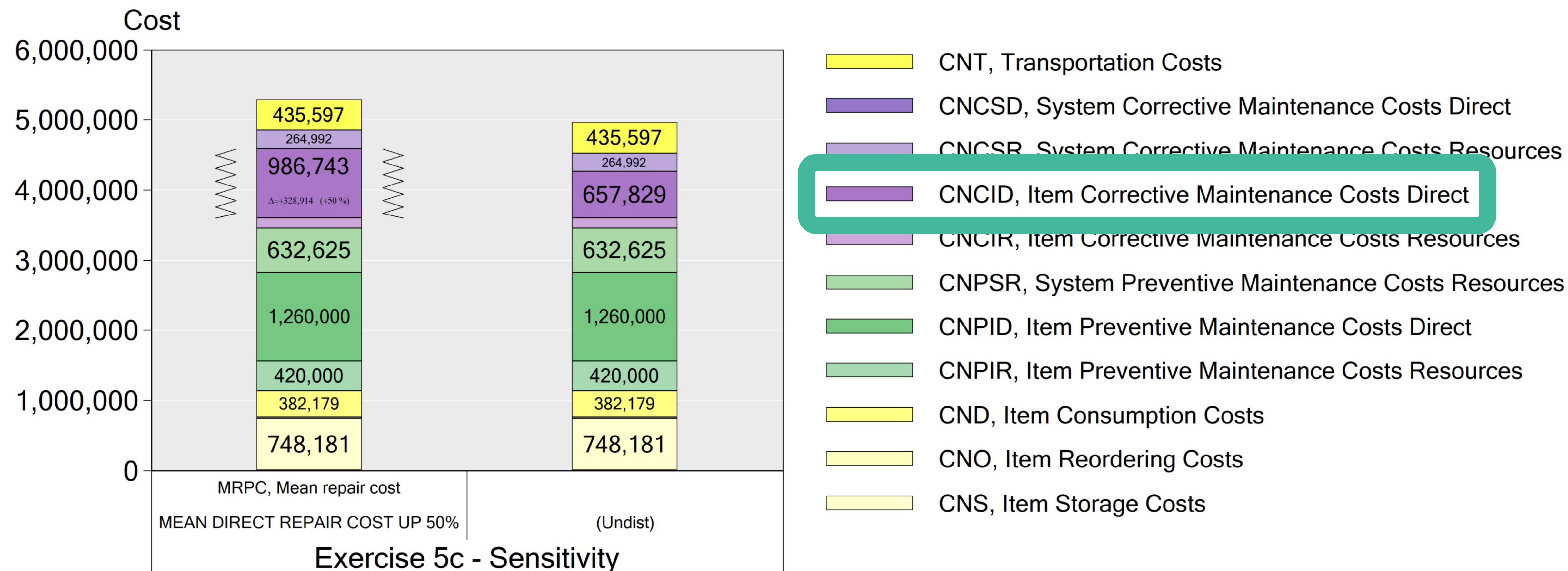
Cost Ranking – Percentages



Sensitivity Analysis



Sensitivity Analysis



Demonstration: Cost Driver Identification & Cost Reduction

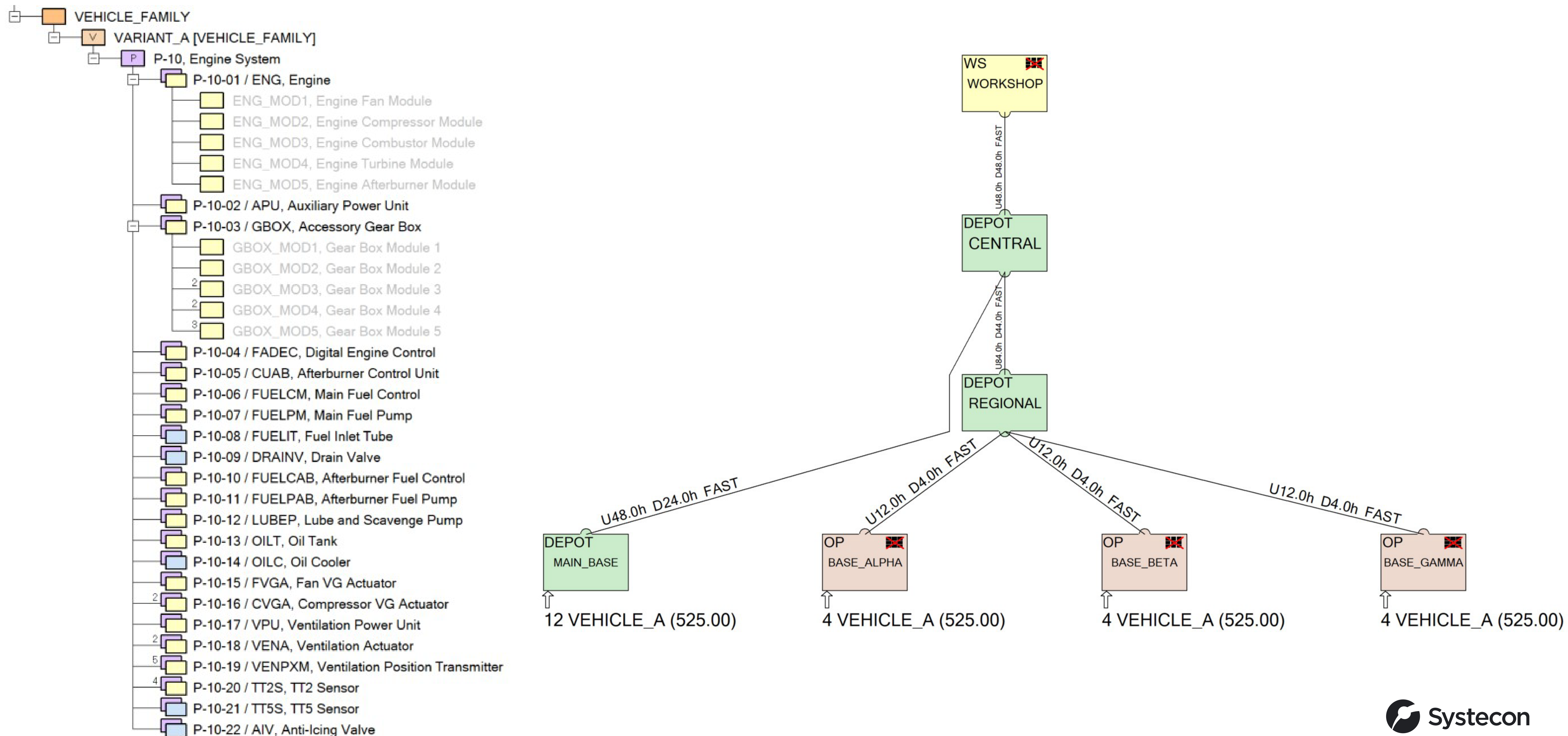
Engine System – Fleet of 24 Aircraft

Demonstration

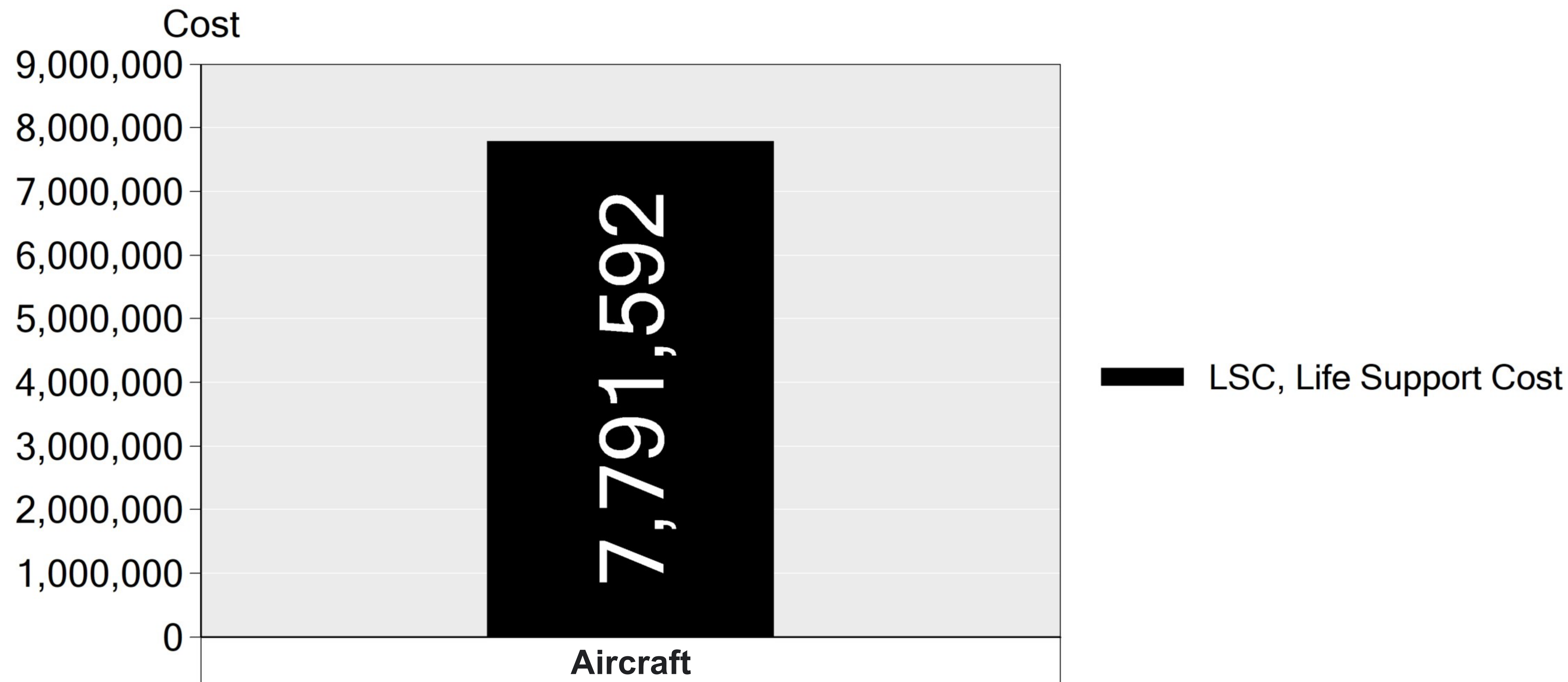
OPUS Suite user tasked with:

- **identifying and understanding cost drivers in the Engine System of fleet of 24 Aircraft**
- **quantifying cost reduction opportunities**

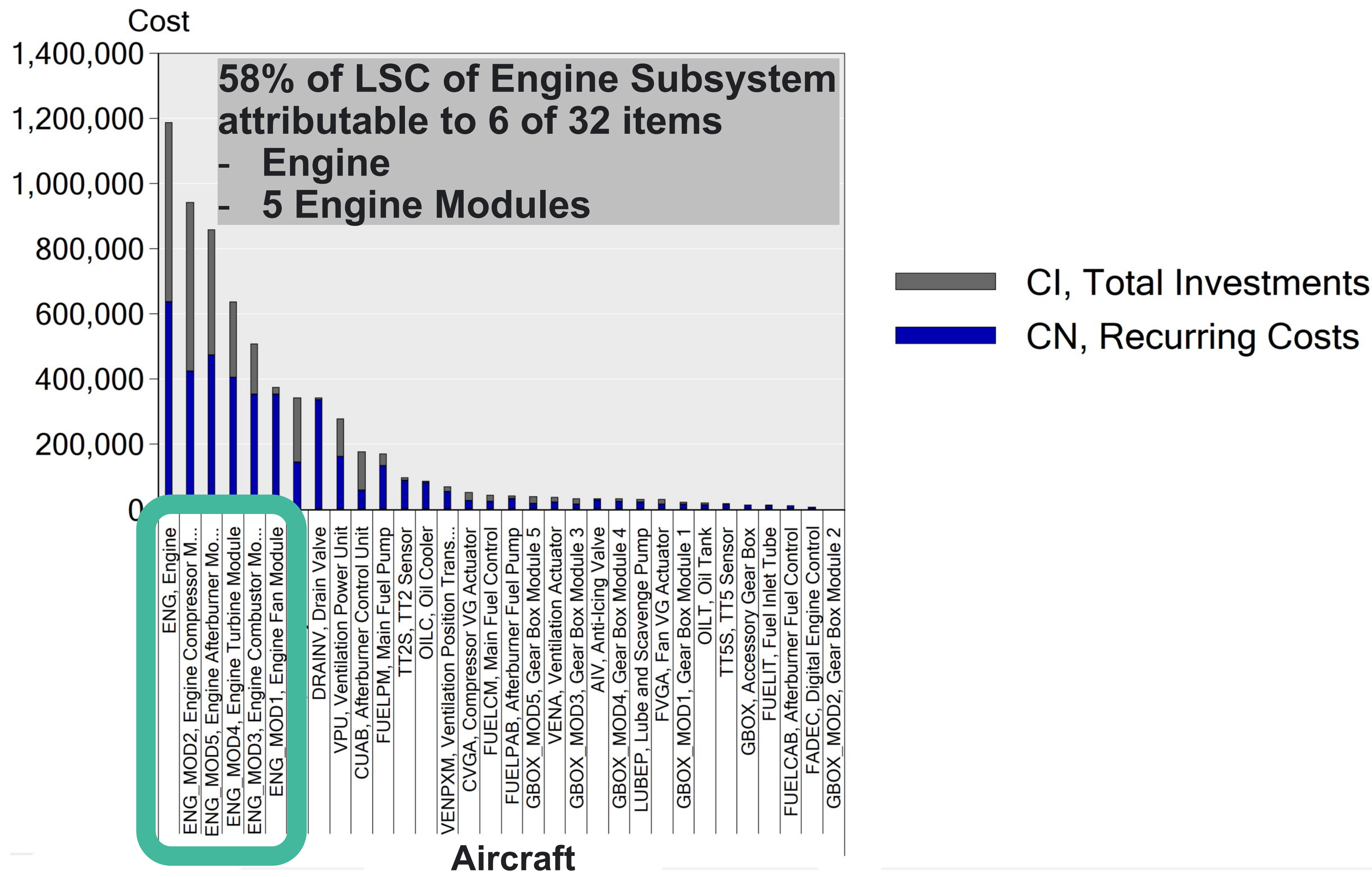
Demonstration



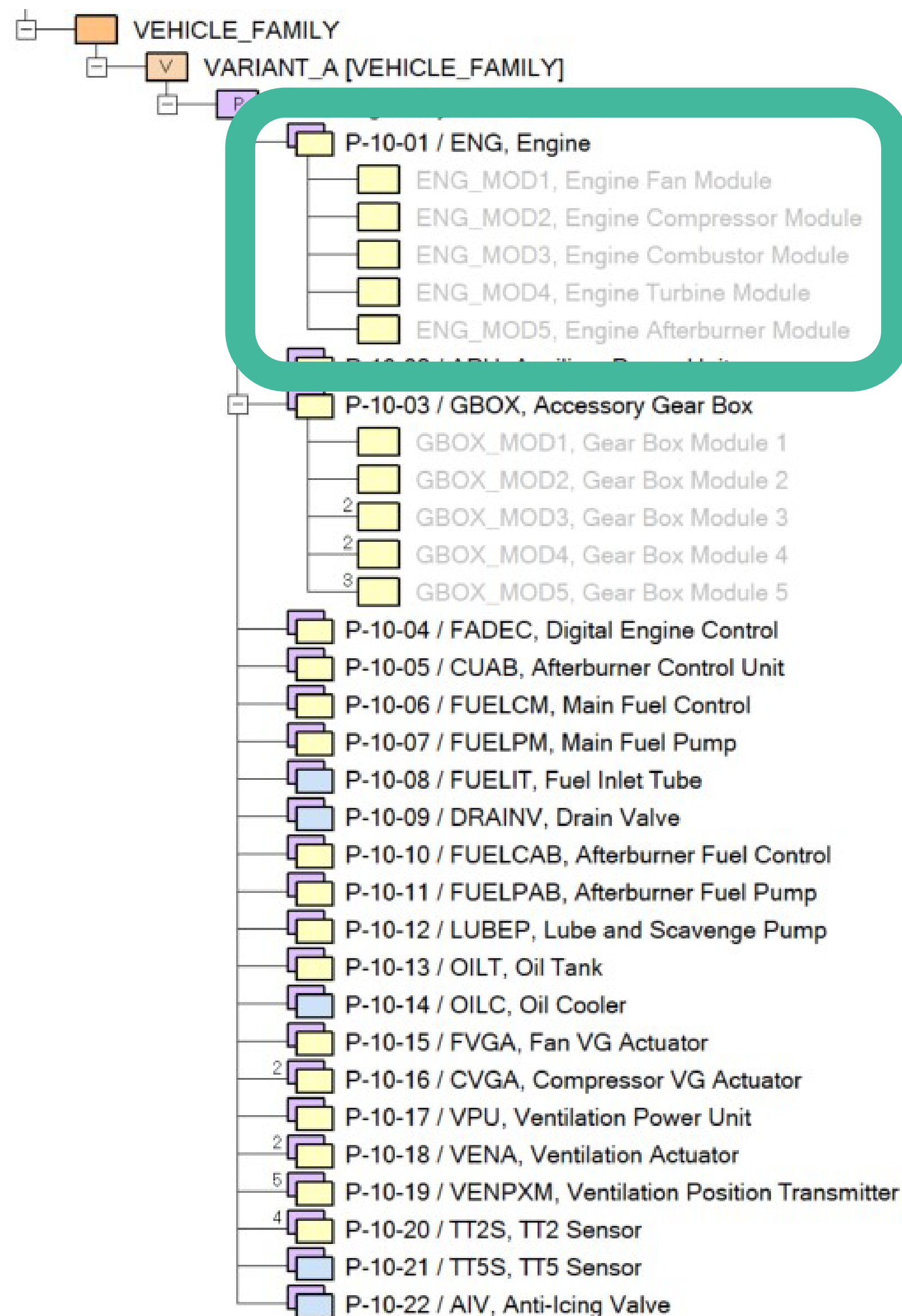
Demonstration



Demonstration



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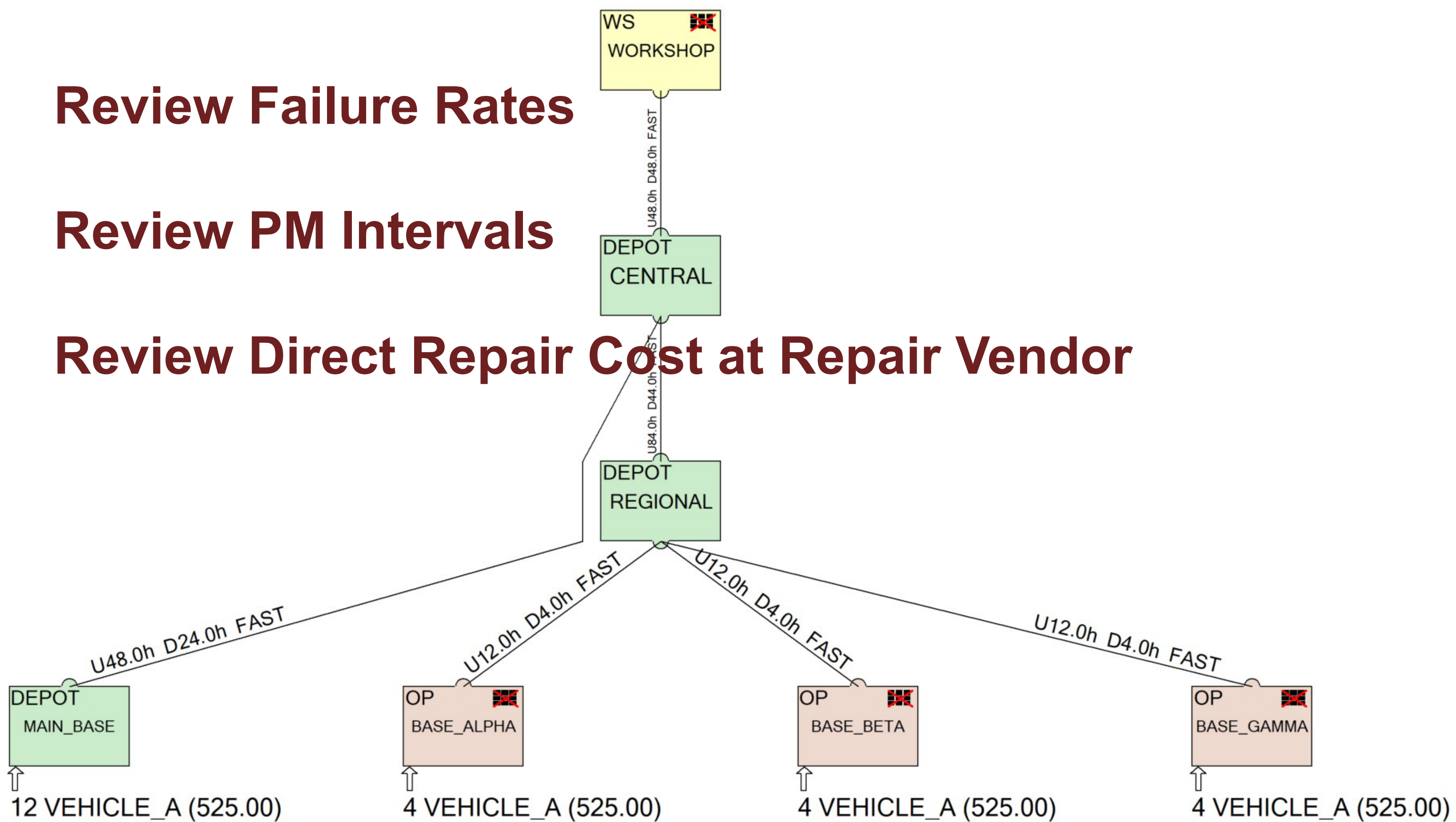


Review Item Price

Review Failure Rates

Review PM Intervals

Review Direct Repair Cost at Repair Vendor



Demonstration

OPUS Suite user engages Engineering Team with their findings and ENG Module review suggestions

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Engineering Team conducts a review of ENG Modules and identifies improvements:

- **Failure Rates reduced 10%**
- **Spare Module prices reduced 5%**
- **PM direct repair cost reduced from \$1200 to \$1000 per overhaul**
- **PM interval refinements:**
 - **Compressor Module and Turbine Module overhaul extended from 600FH to 1200FH**
 - **Afterburner Module overhaul extended from 600FH to 1800FH**

Demonstration

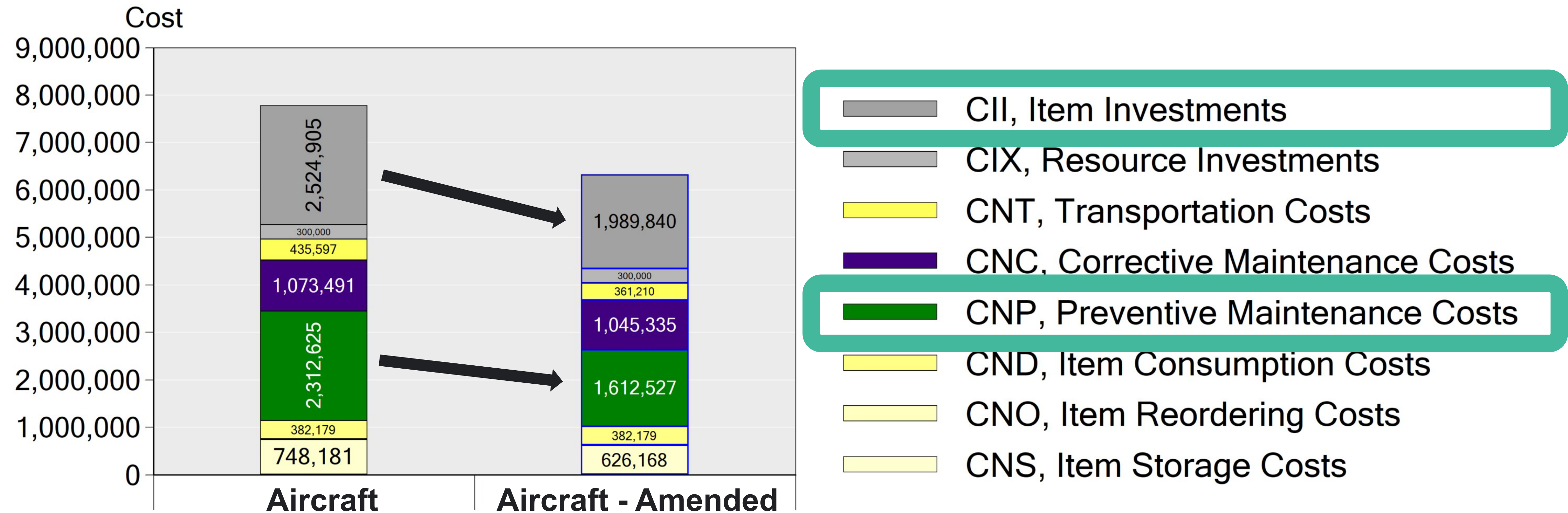
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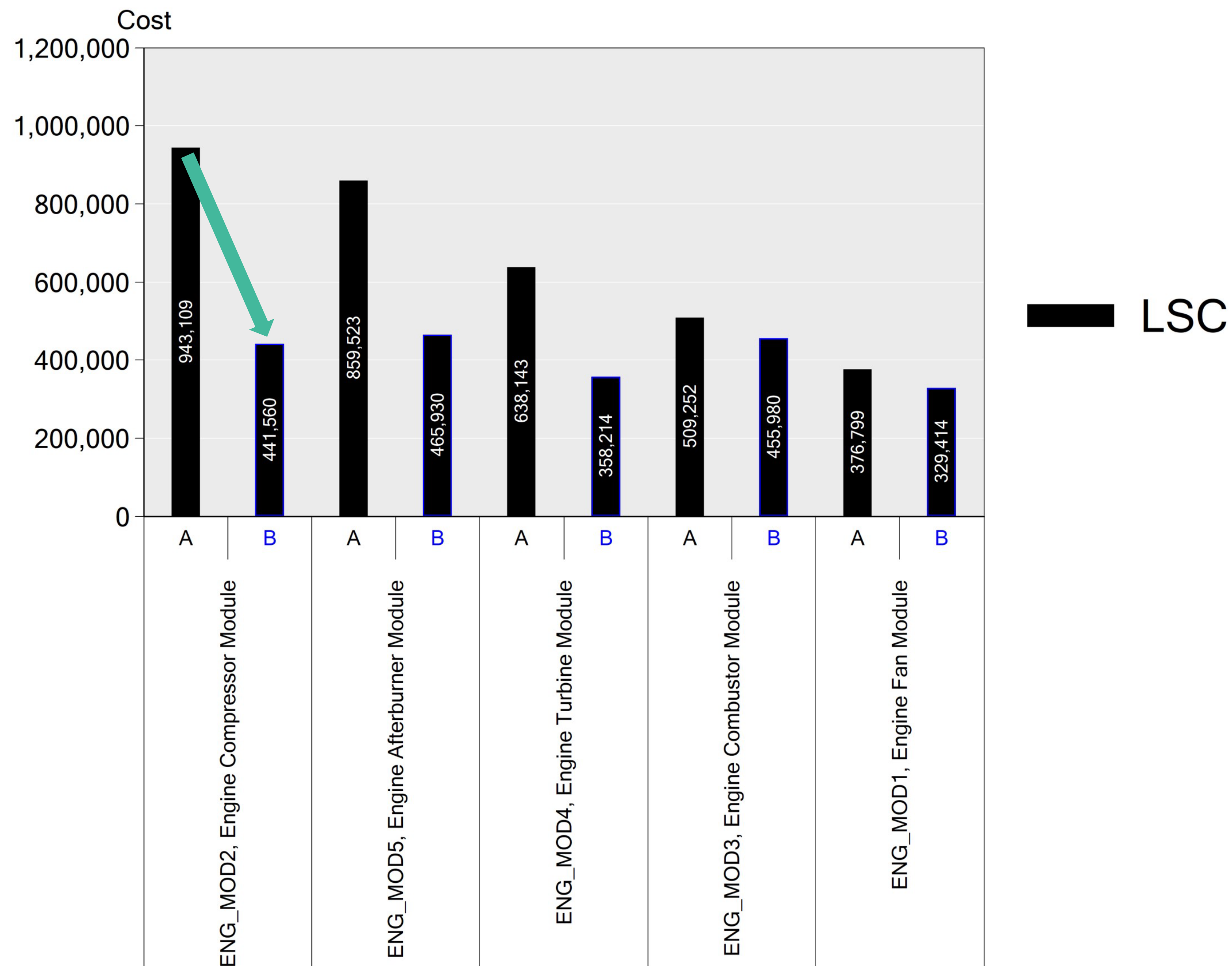
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OPUS Suite user determines the effect on Life Support Cost (LSC) using OPUS10 and CATLOC

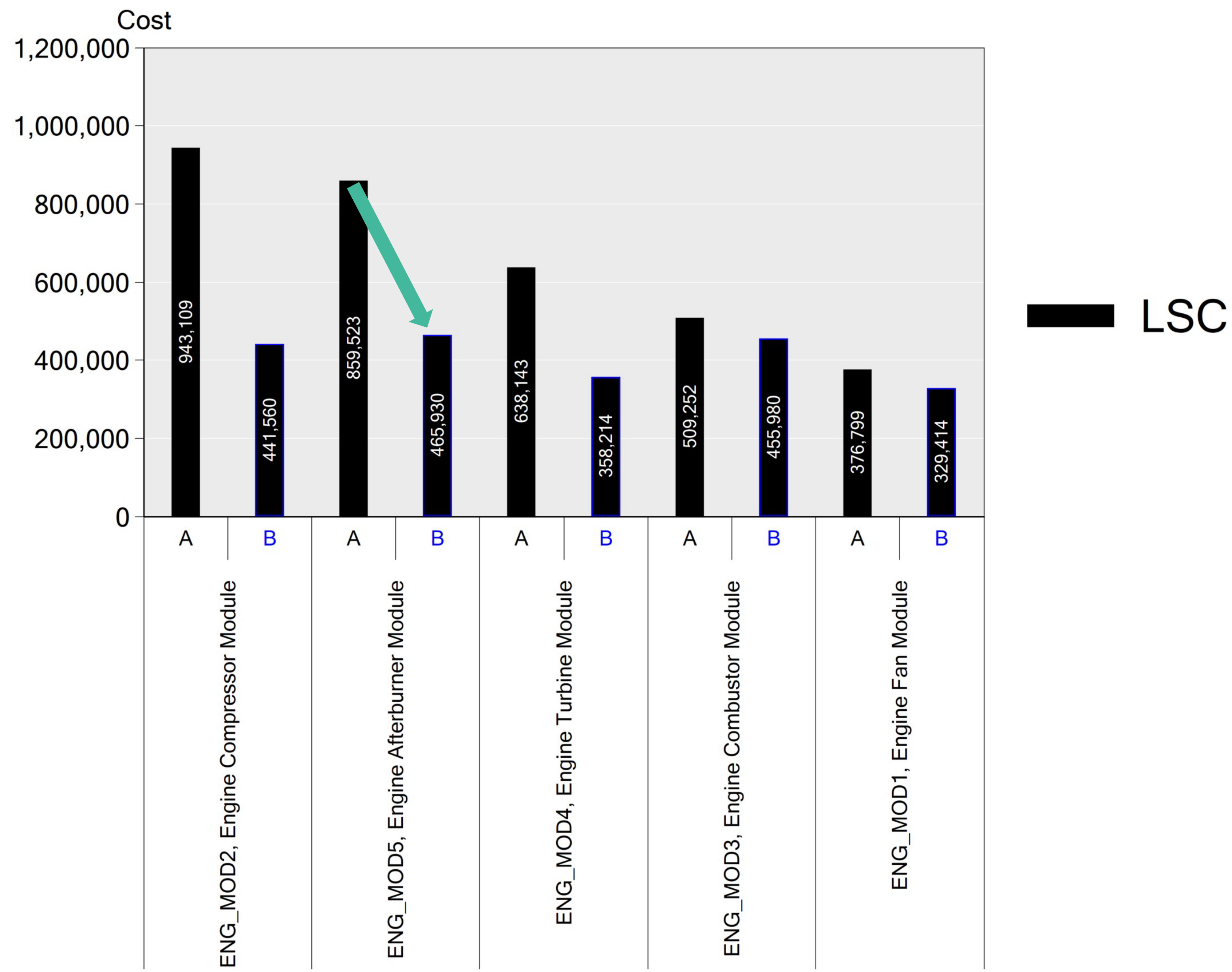
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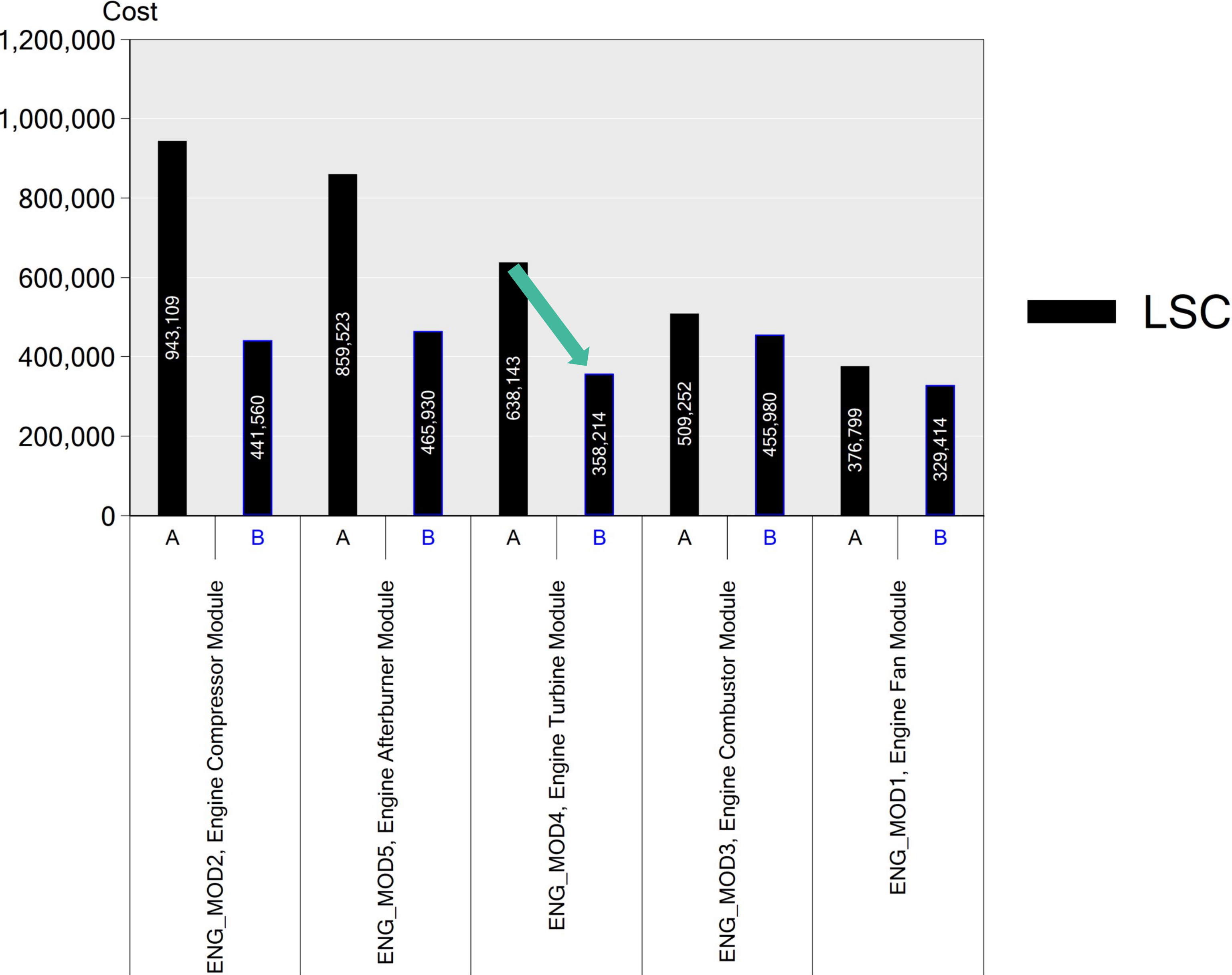
Demonstration



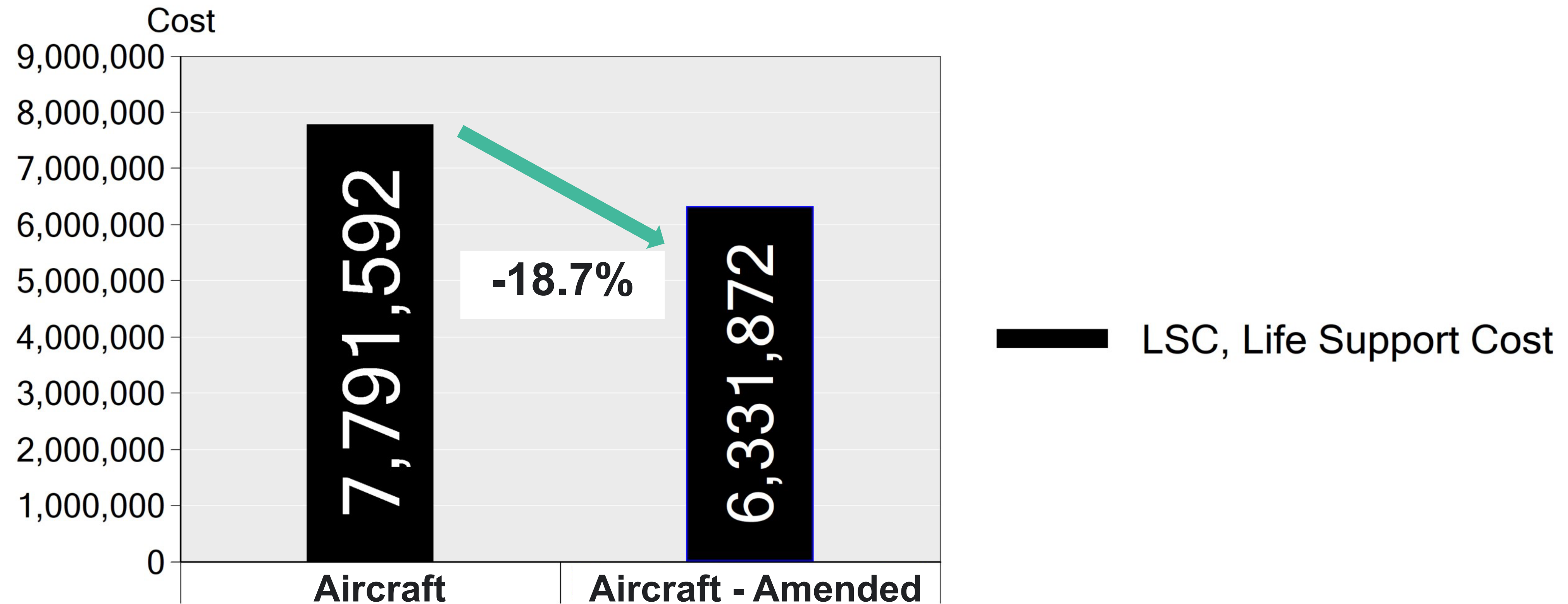
Demonstration



Demonstration



Demonstration



Improvements to PM Interval, Failure Rates, Item Price and Direct Repair (Overhaul) Cost of the 5 ENG Modules reduced the Engine System LSC by 18.7%

Scope Options for your Project or Capability

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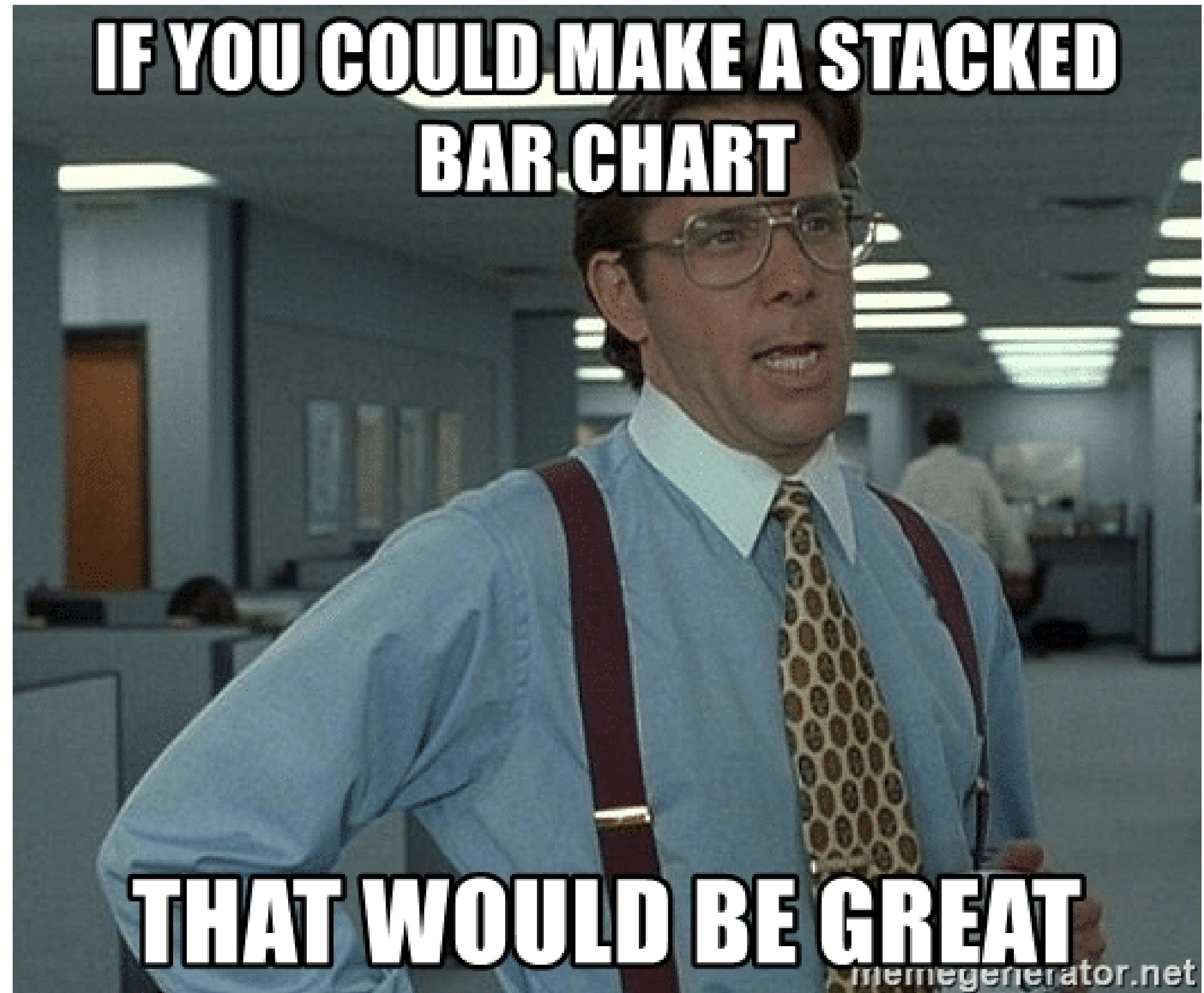
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- Small-scale LCC trade study

Conclusion



Live Demonstration

Thank you.

