[bw] RESEARCH PARTNERSHIP

Oregon Energy Strategy

Jobs Analysis Technical Report

December 16, 2025

Note:

The following slides include data from the jobs analysis for the Oregon Energy Strategy. Due to its technical nature, these slides are not fully accessible for those using screen readers. Instead, those using screen readers may access this same data in the following file: https://www.oregon.gov/energy/Data-and-Reports/Documents/OES-Jobs-Analysis-Data-Library.xlsx

Please contact the Oregon Department of Energy at AskEnergy@oregon.gov if you need further assistance.

Oregon Energy Strategy

Contents

Jobs Analysis

[Evolved Energy Research (EER) modeled scenario energy and investment data through 2050]

→

BW Research (BWR) employment modeling – applying job multipliers on EER data

→

Report jobs by energy sector, industry group, detailed occupation, and region.

Jobs reported for 2024 and every 5 years from 2030-2050*

*Secondary Employment Outputs are reported for 2024 and 2035 only

Oregon Energy Strategy

Part 1: Introduction

Model Framework

1. Determine unit inputs
From EER data – e.g., device stocks and sales, MW electric capacity, fuel demand, etc.

2. Determine unit and total costs
From EER data where provided, additional costs may be assumed from secondary sources.

3. Split costs into industry category by technical costs data
Segment overall costs from EER into industries and based on activity using secondary data sources – e.g., installation of efficiency measures, manufacturing of EV batteries, etc.

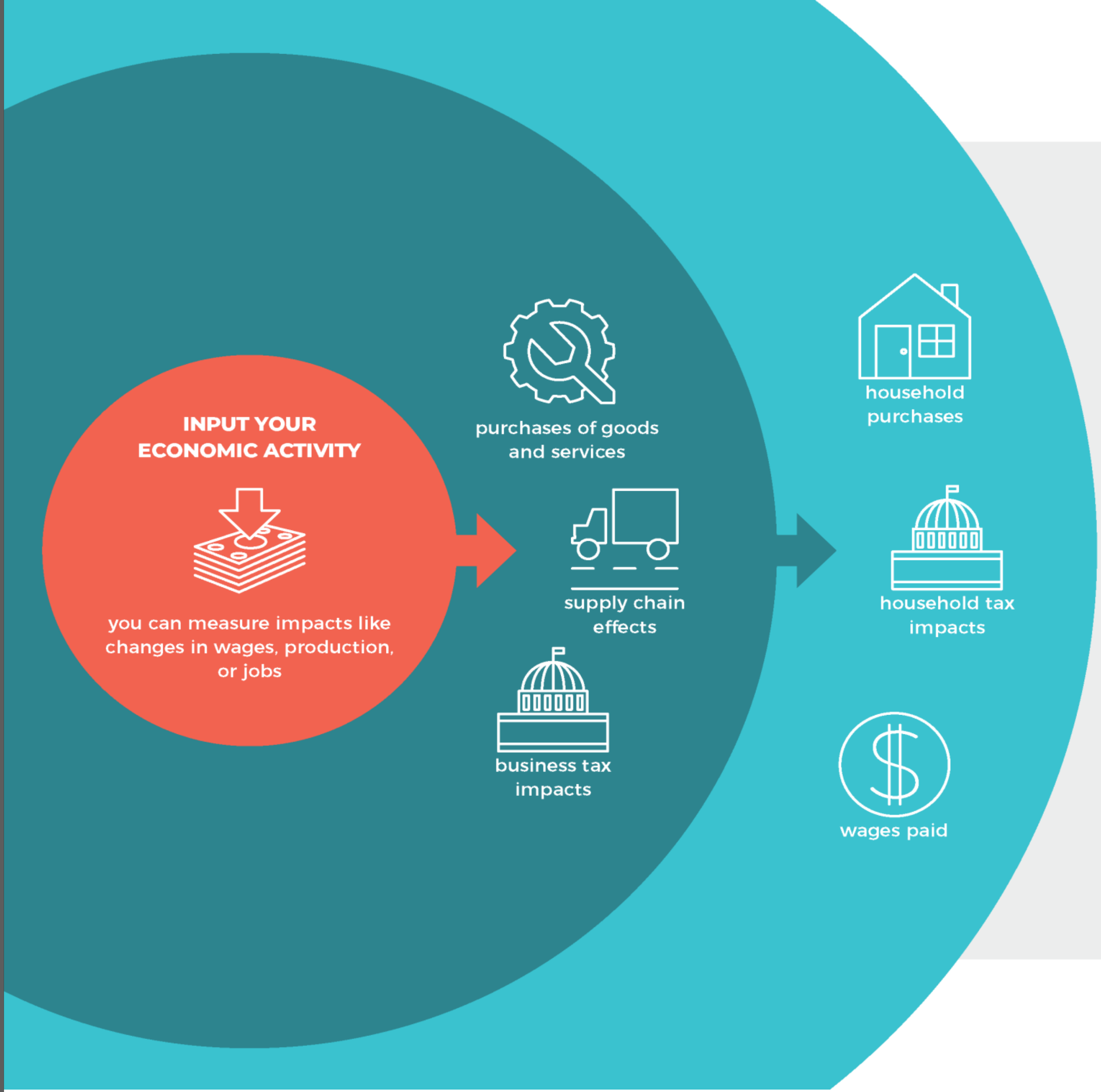
4. Apply multipliers
Input 5-year-increment costs into IMPLAN/JEDI industry multipliers based on the above cost allocation

5. Report
Jobs created by industry group, detailed occupation, and region (per 5-year increments)

Oregon Energy Strategy

Part 1: Introduction

Summary of Input Output Models, IMPLAN & JEDI



WHAT IT SHOWS YOU

DIRECT EFFECTS

These are the initial changes that result from your economic activity. The IMPLAN model will display how the region will economically respond to these initial changes.

INDIRECT EFFECTS

These are the impact of local industries buying goods and services from other local industries as a result of your influence in the economy.

INDUCED EFFECTS

The response by your economy to an initial change that occurs through spending of income received by wage earners.

IMPLAN

All graphs in this presentation include induced effects unless otherwise noted.

Oregon Energy Strategy

Part 1: Introduction

Model Framework

Job Numbers Include & Do Not Include

Include	Do Not Include
Direct, Indirect, and Induced employment changes from the four primary sectors (Electricity, Fuels, Buildings & Transportation)*	The entire economy; this is not a general equilibrium macroeconomic model that measures all the potential changes in the economy
For example:	
Construction jobs to build new power plants to meet increased electricity demand from data centers	Construction jobs to build the data center facilities
Electricians needed to install solar projects or new transmission and distribution power lines	Electricians needed to respond to more frequent extreme weather events impacting transmission lines
Manufacturing jobs assembling components of a home heating appliance, motor vehicle, or piece of fuel processing equipment	Jobs gained or lost at a manufacturing facility due to cost changes in process inputs, including energy, steel, etc.

Oregon Energy Strategy

Part 1: Introduction

Model Framework

- The job metrics presented here are point-in-time estimates, or jobs held within each of the benchmark years. They are not FTEs or job-years and are not cumulative changes over intervening years.

- Job figures reflect the ebb and flow of investments and activities over time.

- Job figures can inform workforce development strategies by identifying required educational programs, apprenticeship trainings, or certifications to support growing sectors.

- While the jobs analysis results are directional and give a sense of scale of future employment demand in Oregon, uncertainty exists in any model.

Oregon Energy Strategy

Part 1: Introduction

Sector Framework

I. Energy Supply

Electricity: 12 sub-sectors

- **Distributed Solar** (Rooftop Solar)
- **Distribution** (Local Power Lines, Smart Grid)
- **Hydropower** (Large-Scale and Run-of-River Hydroelectric Power Generation)
- **Land-Based Wind** (Land-Based Wind Farms)
- **Gas Generation** (Gas Peaker Plants, Combustion Turbine Plants, Combined Cycle Plants)
- **Nuclear** (High-Temperature Gas-Cooled Reactors, Small Modular Reactors*)
- **Other Fossil Generation** (Oil, Other Fossil Fuel Burning Plants)
- **Other Renewable Generation - Biomass**
- **Other Renewable Generation – Enhanced Geothermal***
- **Storage** (Batteries, Flywheel, Thermal Energy, Pumped Hydro)
- **Transmission** (Regional Transmission)
- **Utility Solar** (Utility Photovoltaic, Concentrated Solar Power)

*Denotes emerging technology which would need additional development in affordability and scalability to reach levels projected by EER modeling through 2050.

Oregon Energy Strategy

Part 1: Introduction

Sector Framework

I. Energy Supply

Fuels: 5 sub-sectors

- **Hydrogen** (Hydrogen Electrolysis and Transportation)
- **Biofuels** (Ethanol, Bio-gasification, Biomass Fast Pyrolysis)
- **Natural Gas Production, Trade, and Support Services**
- **Natural Gas Distribution** (Natural Gas Pipelines, Liquefied Natural Gas Trucks and Tankers)
- **Other Fossil Fuels** (Oil and Gas, Coal, Kerosene)

Oregon Energy Strategy

Part 1: Introduction

Sector Framework

II. Energy Demand

Buildings: 5 sub-sectors*

- **Commercial HVAC** (Pipes, Sheet Metal, Heating, Air Conditioning, Refrigeration, Power Boilers, Heat Exchangers)
- **Commercial Other** (Commercial Lighting, Cooking, Refrigeration, Water Heating, etc.)
- **Residential HVAC** (Sheet Metal, Heating, Air Conditioning)
- **Residential Shell** (Paintings, Coatings, Insulation, Windows, Doors)
- **Residential Other** (Laundry, Refrigerators, Lighting, Water Heating, Cooking, Freezing, Clothes Washing and Drying, Dishwashing, etc.)

*Commercial Shell is not included as a Buildings sub-sector because it is not included in the EER EnergyPATHWAYS model.

Oregon Energy Strategy

Part 1: Introduction

Sector Framework

II. Energy Demand

Transportation: 5 sub-sectors

- **Charging Stations** (Manufacturing, Installation, Maintenance)
- **Fueling Stations** (Fossil Fueling Stations)
- **Vehicle Maintenance** (Vehicle Repair and Maintenance Activities)
- **Vehicle Manufacturing** (Electric Vehicles, Conventional Vehicles, Dual-Use Technologies)
- **Wholesale Trade Parts** (Wholesale of Vehicle Components)

Oregon Energy Strategy

Part 1: Introduction

Initial Employment Outputs (IEOs) include:

1. Employment in East Oregon, West Oregon, and Oregon for 2024, 2030, 2035, 2040, 2045 & 2050

2. Overall and Industry annual employment by sub-sector in each region

Oregon Energy Strategy

Part 1: Introduction

Industry Categories

Construction | Manufacturing | Professional Services | Other Supply Chain | Induced

– Employment figures in this deck cover the construction, manufacturing, professional services, other supply chain, and induced industry categories:
  - **Construction** includes new and maintenance and repair construction
  - **Manufacturing** includes equipment fabrication, fuel production, and machinery manufacturing
  - **Professional Services** includes law offices, accounting services, and engineering and design
  - **Other Supply Chain** includes agriculture, utilities, wholesale trade, transportation, and other services
  - **Induced** includes employment supported by direct and indirect workers spending their wages in the local economy, e.g., employment at restaurants, hospitals, banks, etc.

Oregon Energy Strategy

Part 1: Introduction

Secondary Employment Outputs (SEOs) include:

1. Occupational employment for 2024 and 2035, by sector
2. Wage analysis for 2024 and 2035, by sector
3. Regional comparison for 2024 and 2035, by sector

IEO to SEO & Wage Analysis

I/O Model Industry Employment Outputs

NAICS Industry Employment (IMPLAN-NAICS crosswalk)

SOC Occupational Employment (BW staffing patterns)

Estimate sustainable wages in each region using MIT Living Wage Calculator

Employment Categorized proportionally into:

Tier 1 – Above sustaining wage

Tier 2 - At sustaining wage

Tier 3 - Below sustaining wage

Oregon Energy Strategy

Part 1: Introduction

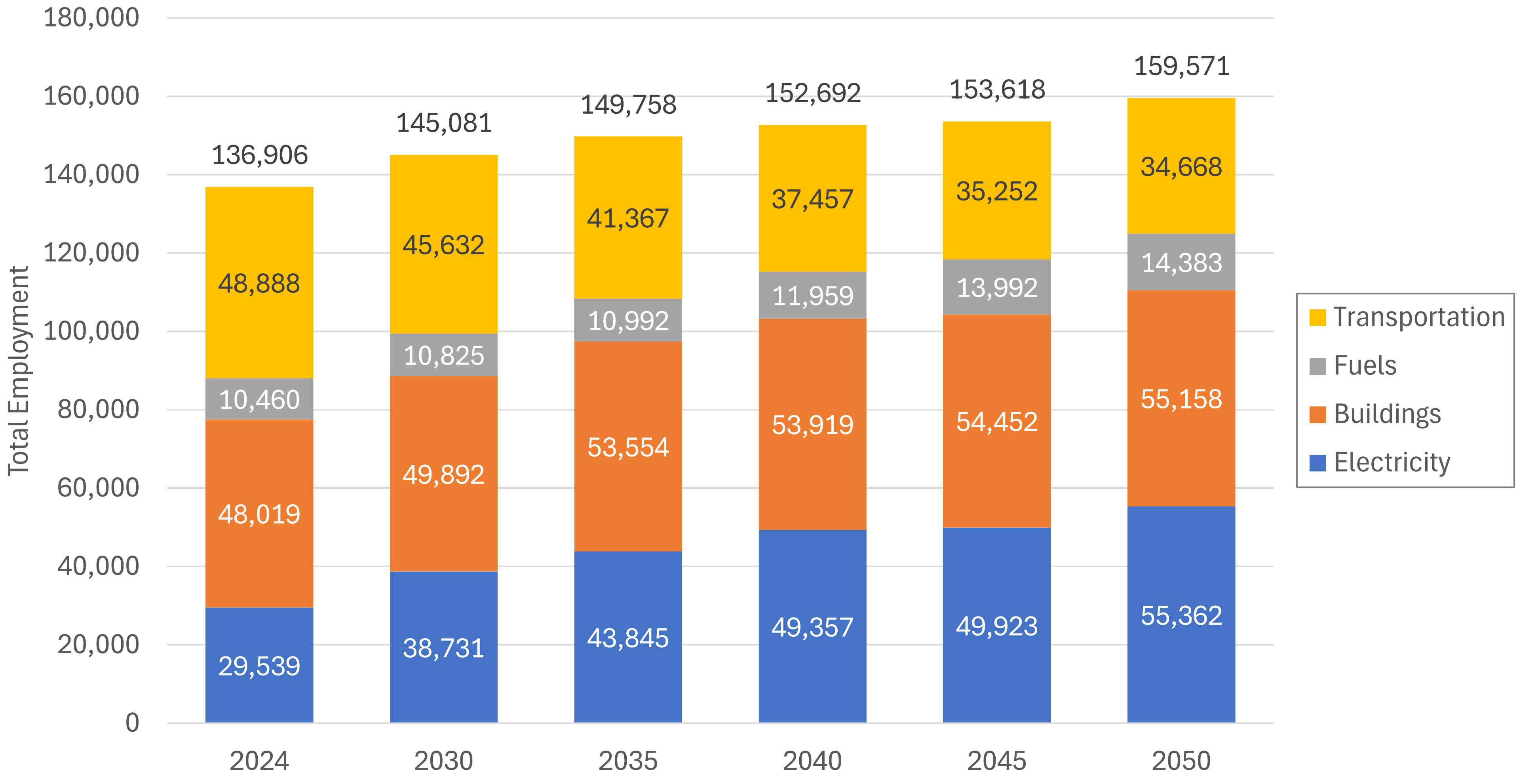
Reference Scenario Energy Model Description

- The Evolved Energy Research (EER) model must solve to meet **Oregon's anchor climate and clean energy goals**:
  - *Executive Order 20-04* (80 percent economy-wide reduction in greenhouse gas emissions by 2050)
  - *HB 2021* (100 percent reduction in greenhouse gas emissions by 2040 for the state's largest investor-owned electric utilities and Electricity Service Suppliers)
  - The *Climate Protection Program* (90 percent reduction in greenhouse gas emissions from fuels by 2050)
- Built on **best available data** and **aggressive but achievable assumptions** that reflect least-cost path to decarbonization
  - Developed in collaboration with industry and community experts to inform modeling inputs
  - Where possible, uses Oregon-specific data collected from up-to-date Oregon datasets, past studies, and consultations
- Determines **energy demand** from energy-consuming technologies across 80 different sub-sectors over time
  - Assumptions about how these technologies change, including improvements in energy efficiency, when these technologies are expected to turn over, and what they will be replaced with at the end of their useful life
  - Also considers factors like weather, population growth, industrial load growth
- Searches for **least-cost mix of resources to meet demand** across all energy-consuming sectors while meeting key climate and energy goals and maintaining reliability
  - Also considers availability of energy supply infrastructure to deliver that energy
- For more detail, see Energy Modeling Technical Report, pg. 13, and Modeling Assumptions and Sources

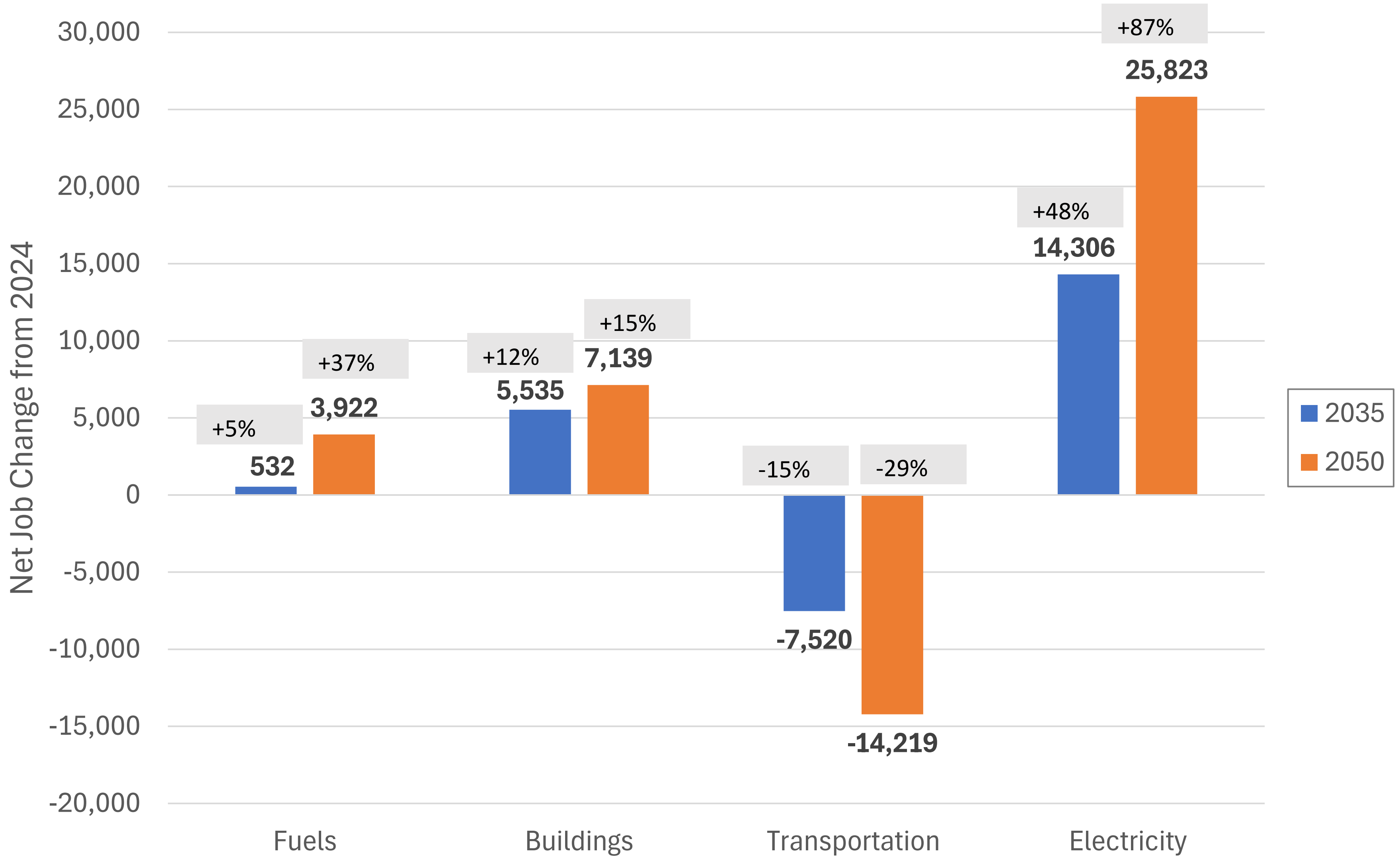
Part 2.1

Reference Scenario Key Findings - Oregon

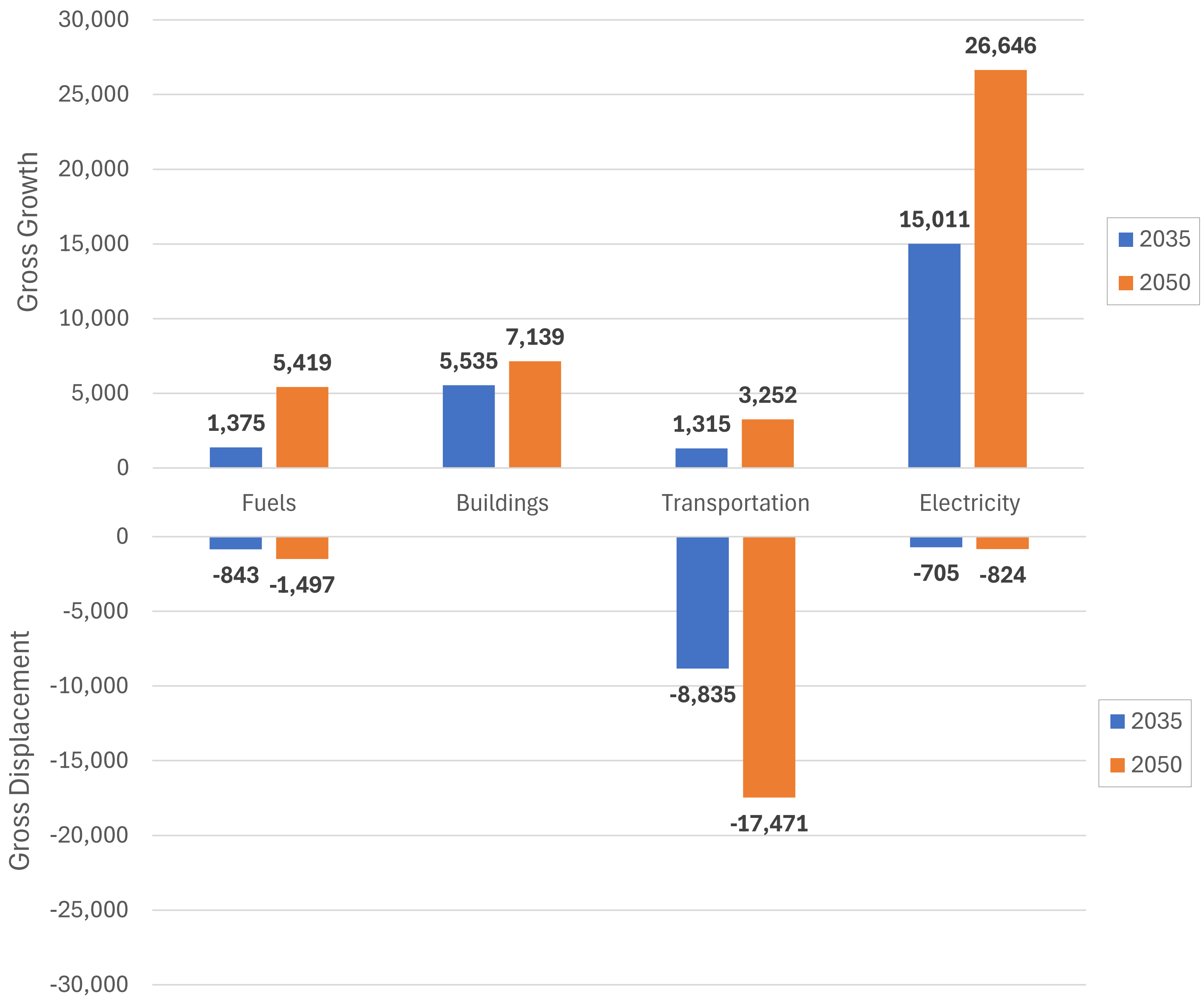
REFERENCE SCENARIO: **TOTAL EMPLOYMENT,** OREGON



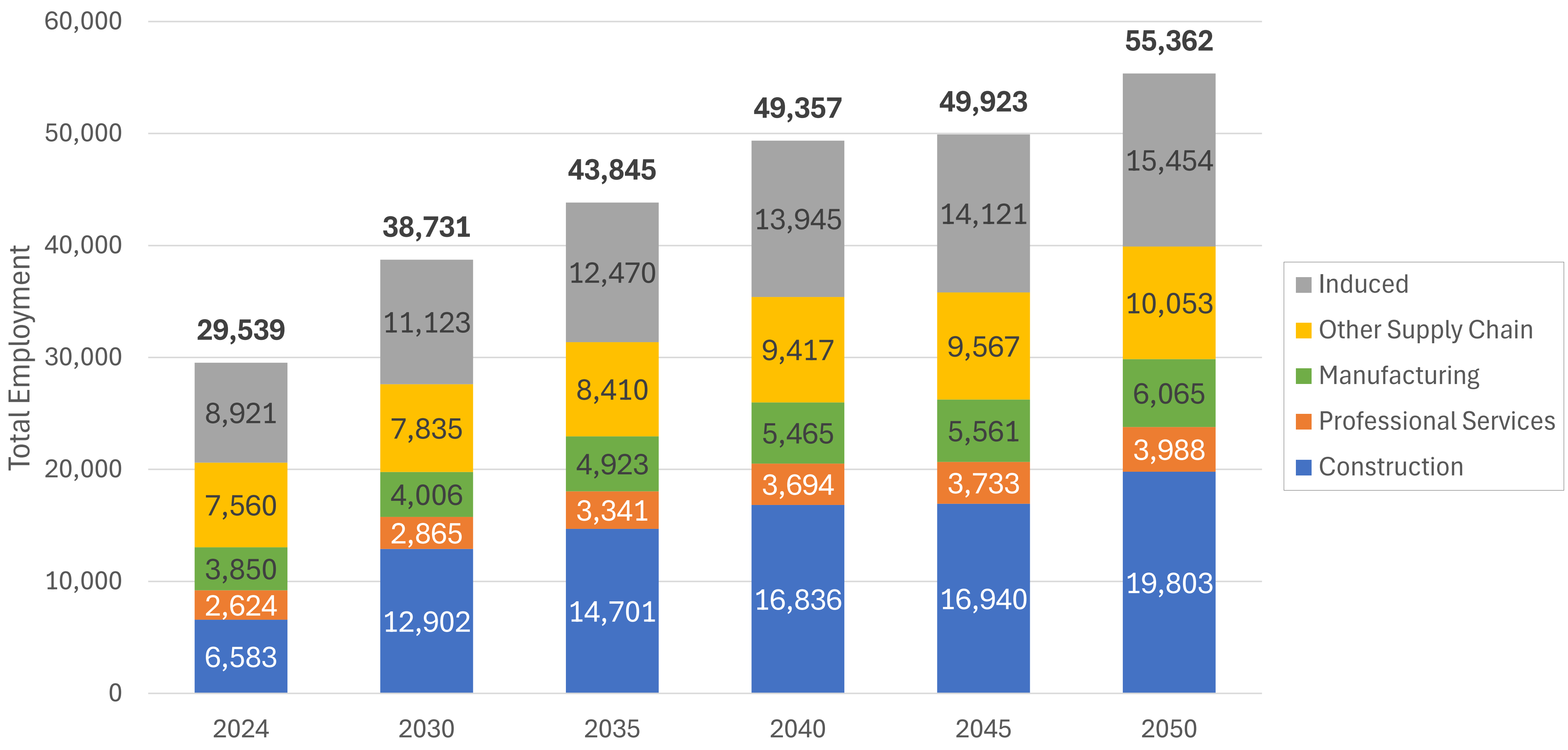
REFERENCE SCENARIO: **NET EMPLOYMENT CHANGES FROM 2024,** OREGON



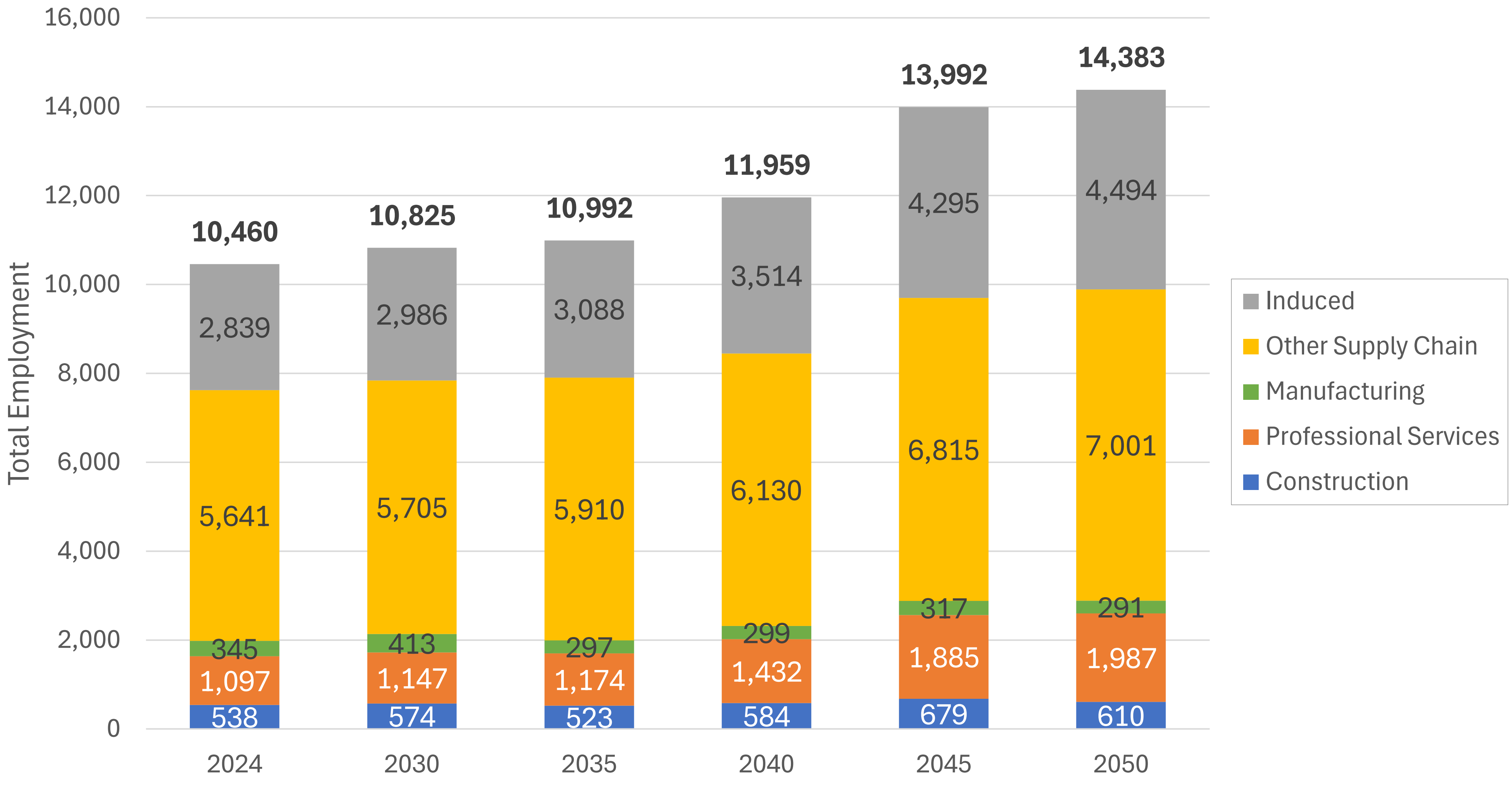
REFERENCE SCENARIO:
GROSS EMPLOYMENT CHANGES FROM 2024, OREGON



REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, ELECTRICITY – TOTALS**



REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, FUELS – TOTALS**



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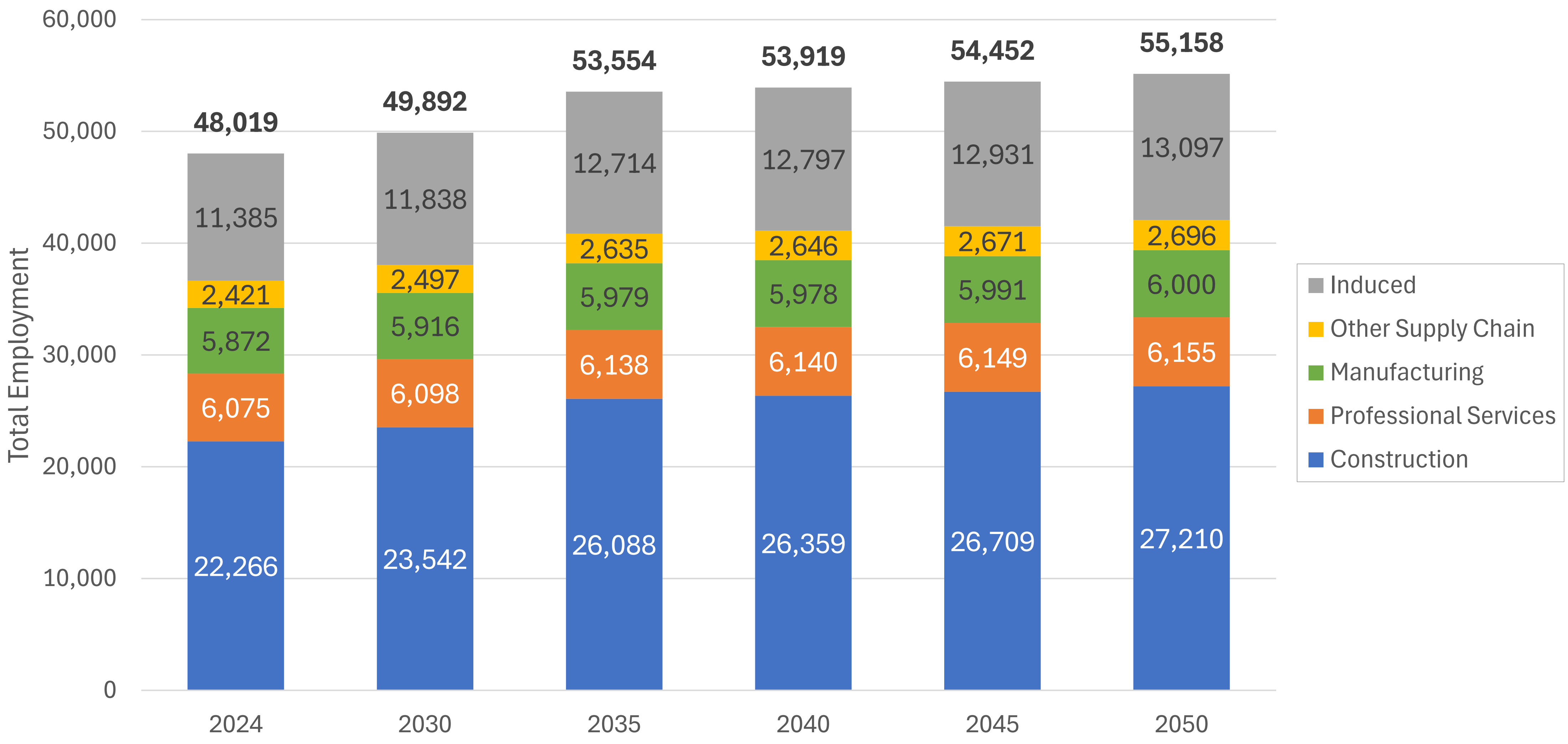
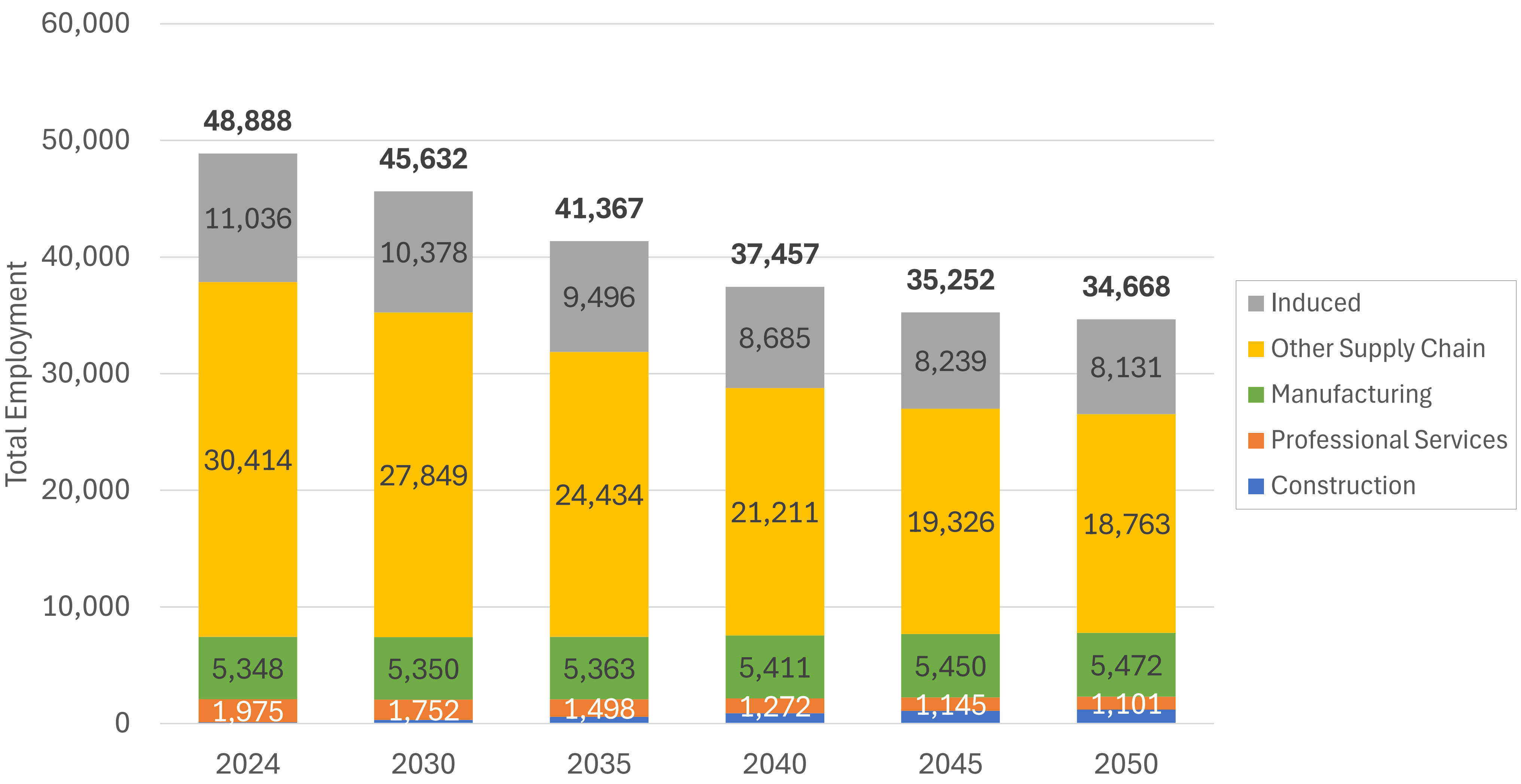
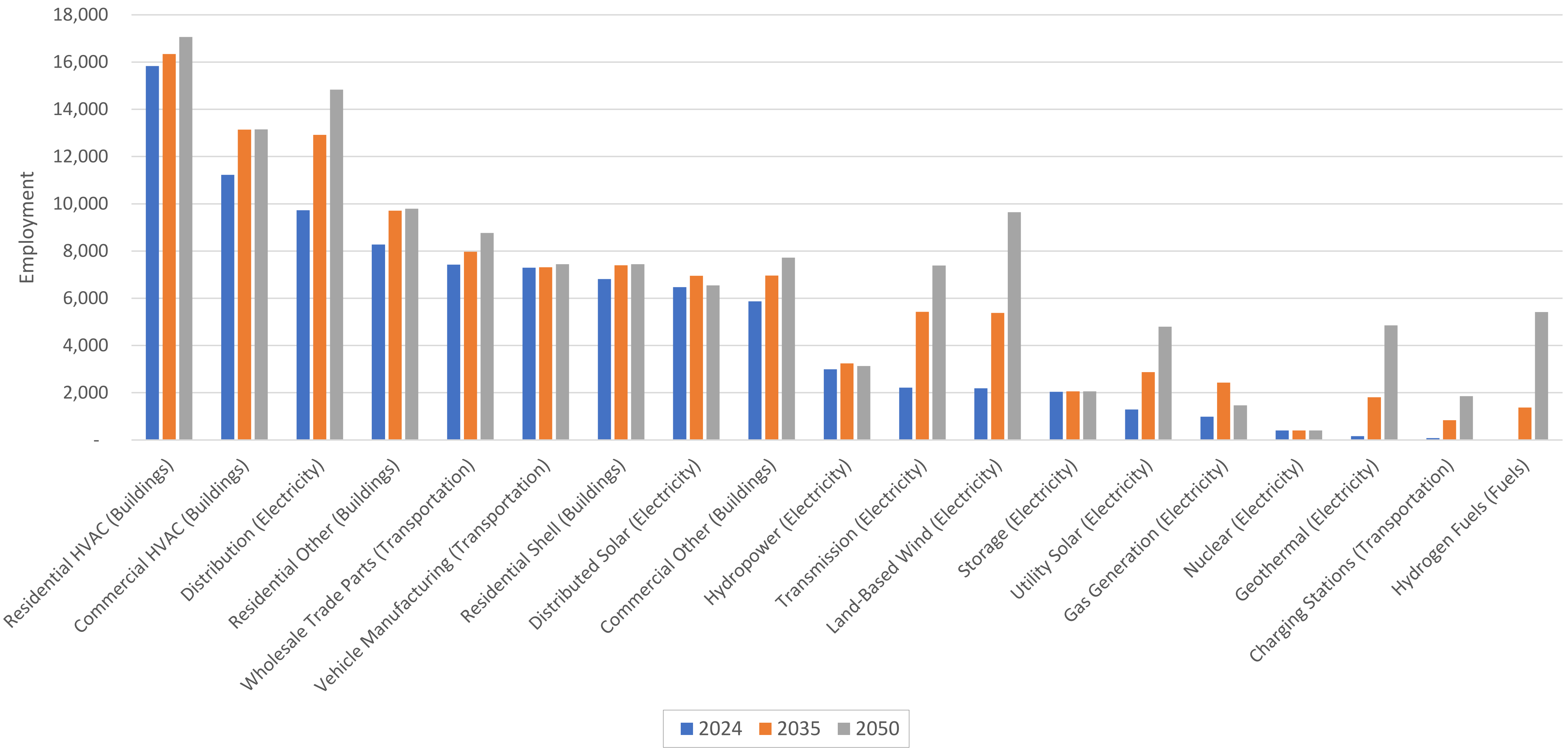


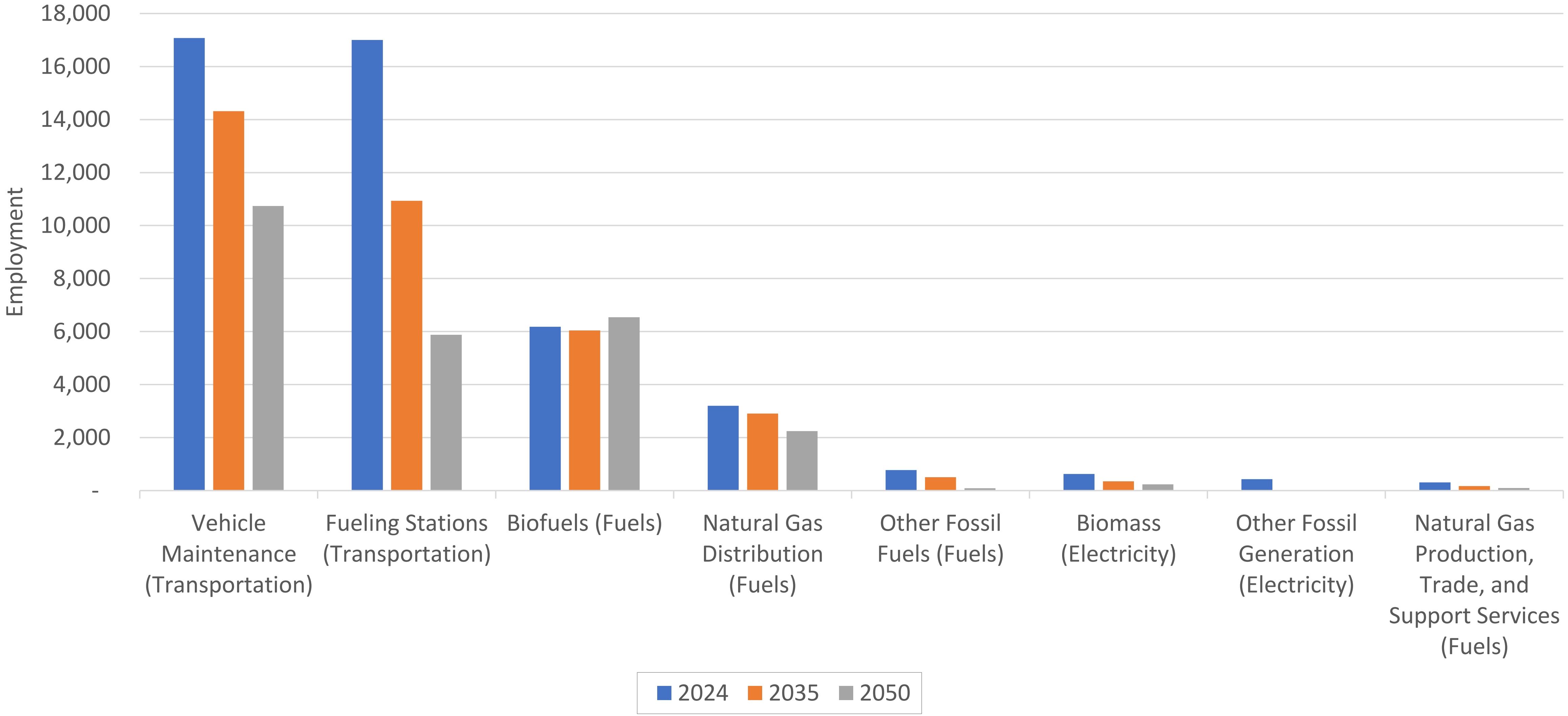
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, TRANSPORTATION – TOTALS**



REFERENCE SCENARIO: **GROWTH SUBSECTORS EMPLOYMENT IN 2024, 2035, AND 2050**



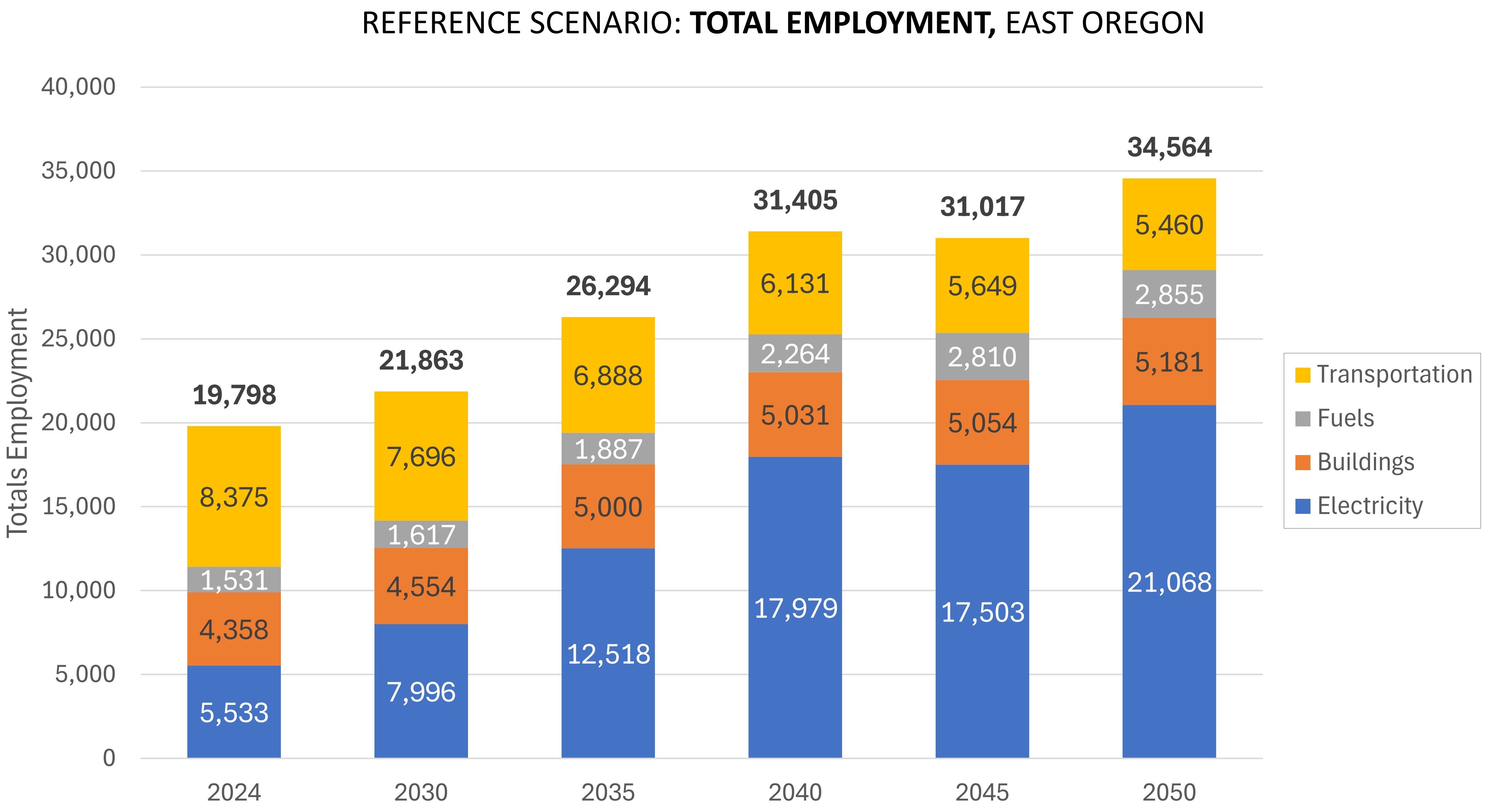
REFERENCE SCENARIO: **DISPLACED SUBSECTORS EMPLOYMENT IN 2024, 2035, AND 2050**



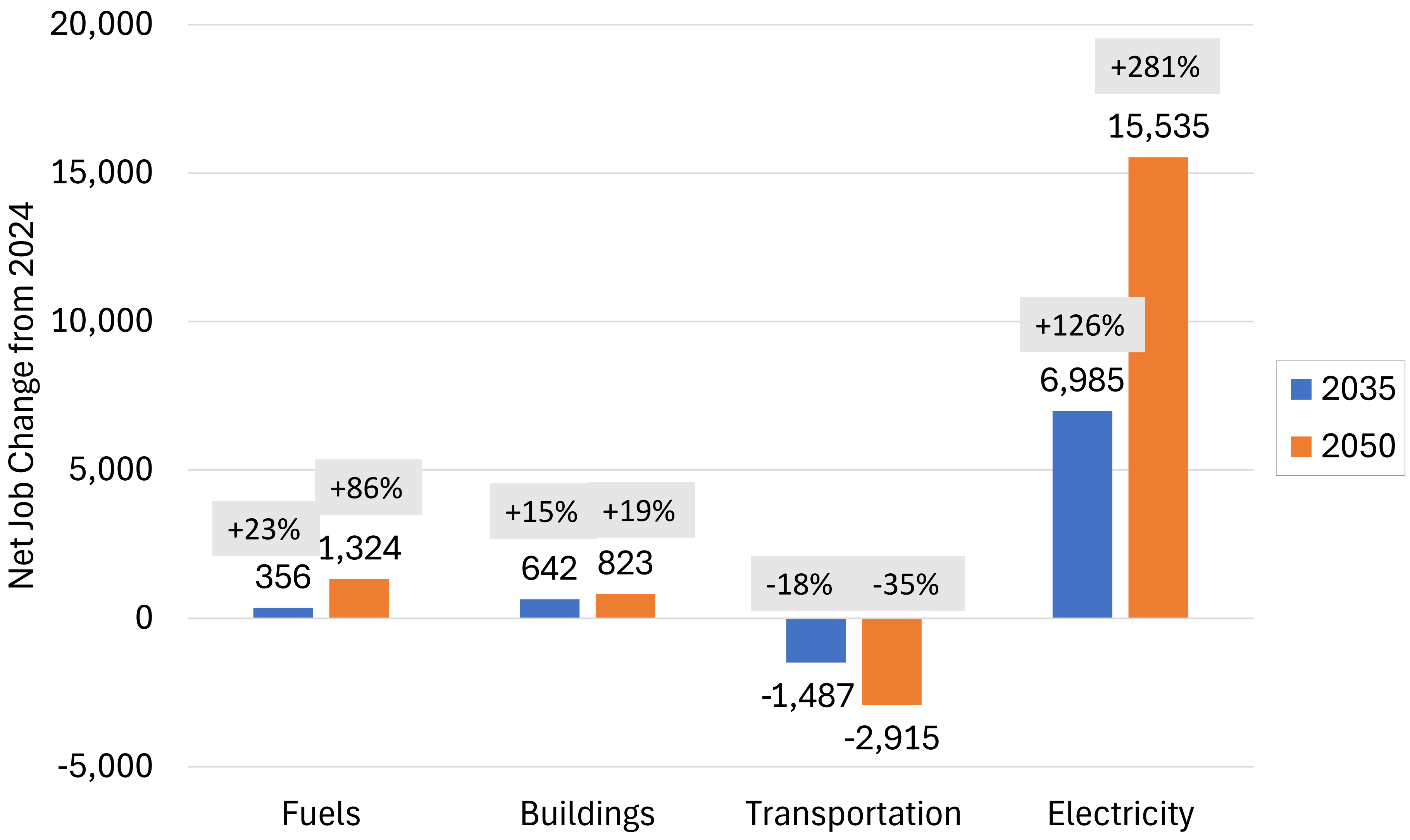
Part 2.2

Reference Scenario Key Findings – East Oregon*

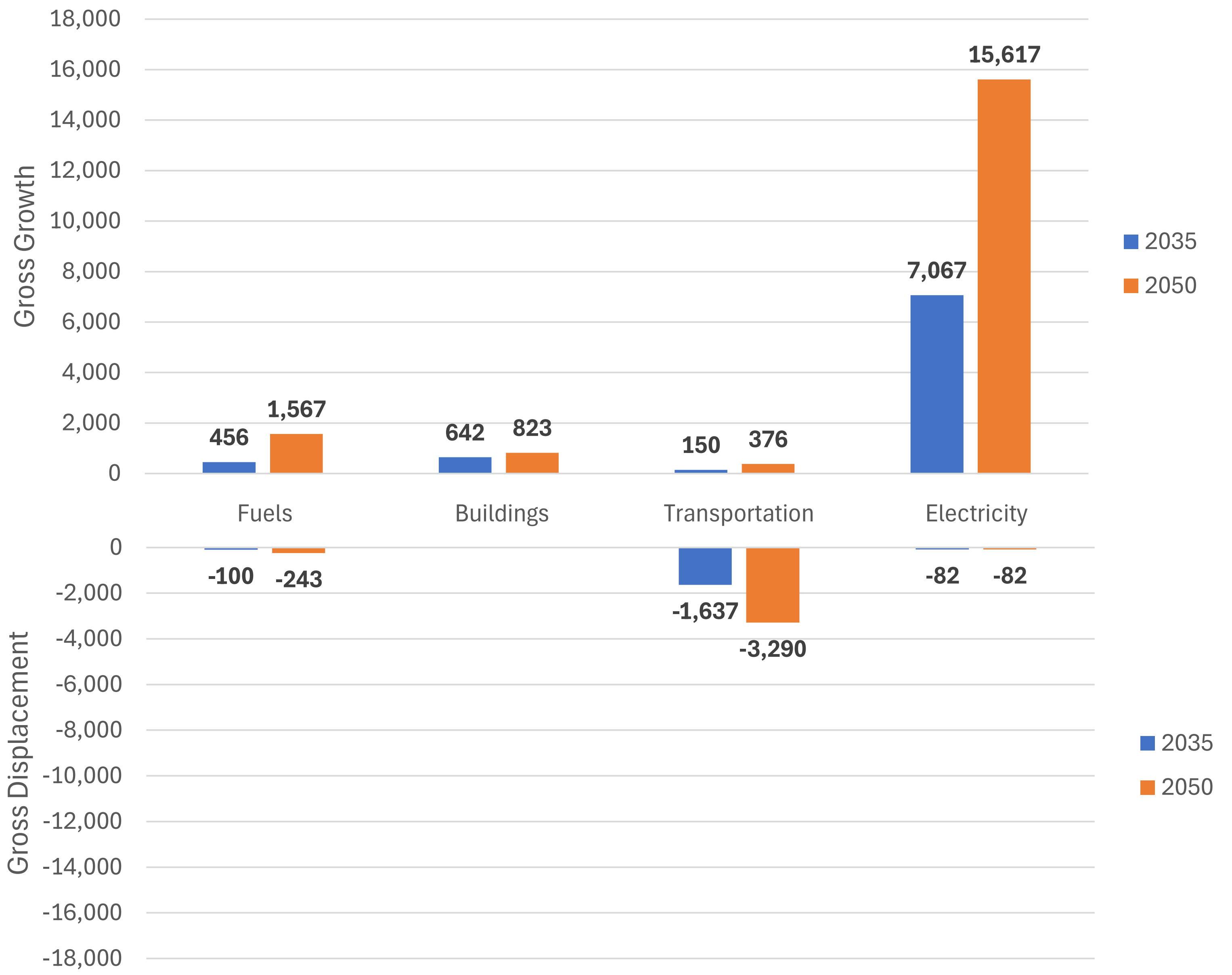
**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*


REFERENCE SCENARIO: TOTAL EMPLOYMENT, EAST OREGON
Totals Employment
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2024
2030
2035
2040
2045
2050
19,798
21,863
26,294
31,405
31,017
34,564
8,375
1,531
4,358
5,533
7,696
1,617
4,554
7,996
6,888
1,887
5,000
12,518
6,131
2,264
5,031
17,979
5,649
2,810
5,054
17,503
5,460
2,855
5,181
21,068
Transportation
Fuels
Buildings
Electricity

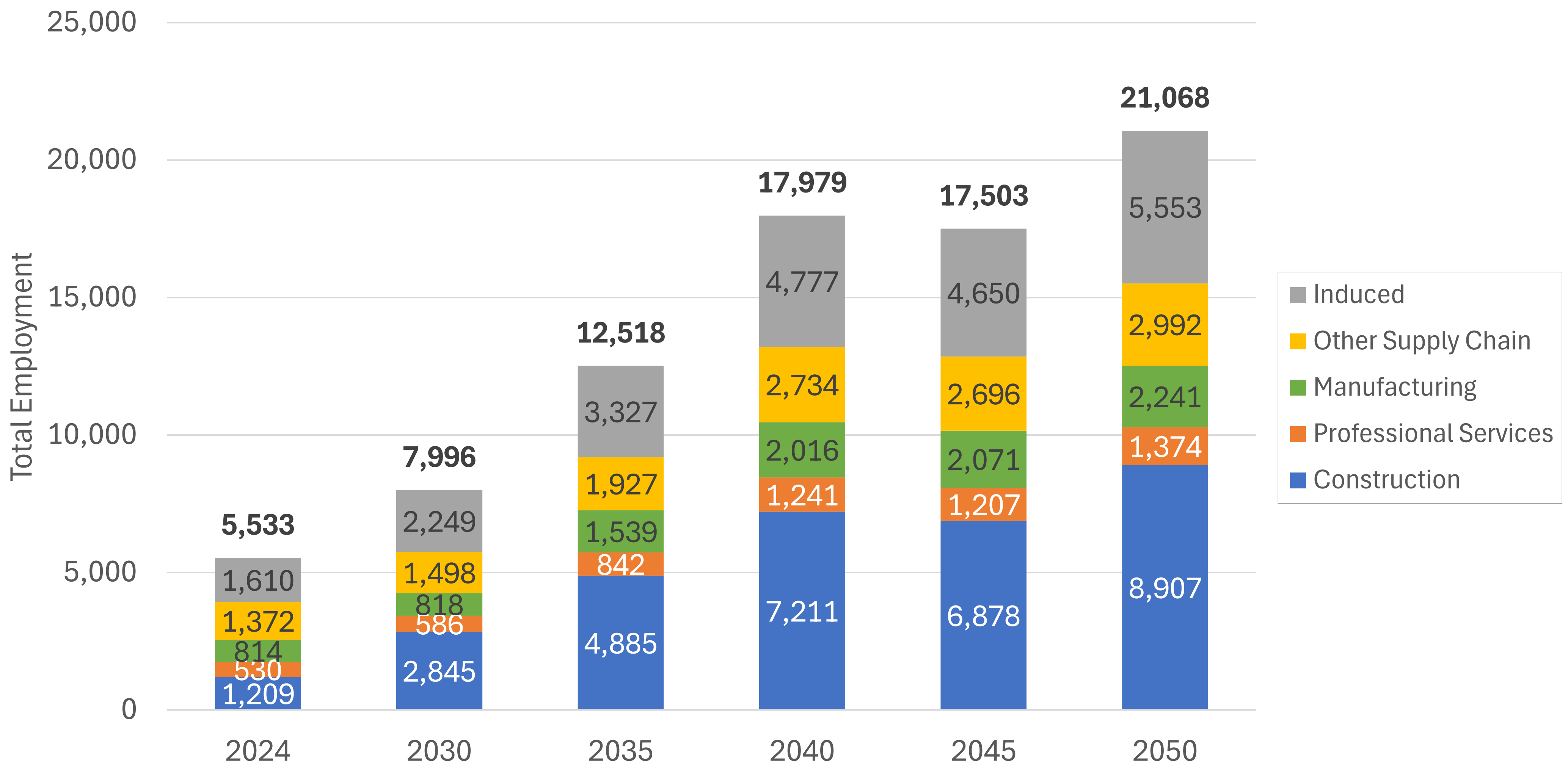
REFERENCE SCENARIO: **NET EMPLOYMENT CHANGES FROM 2024,** EAST OREGON



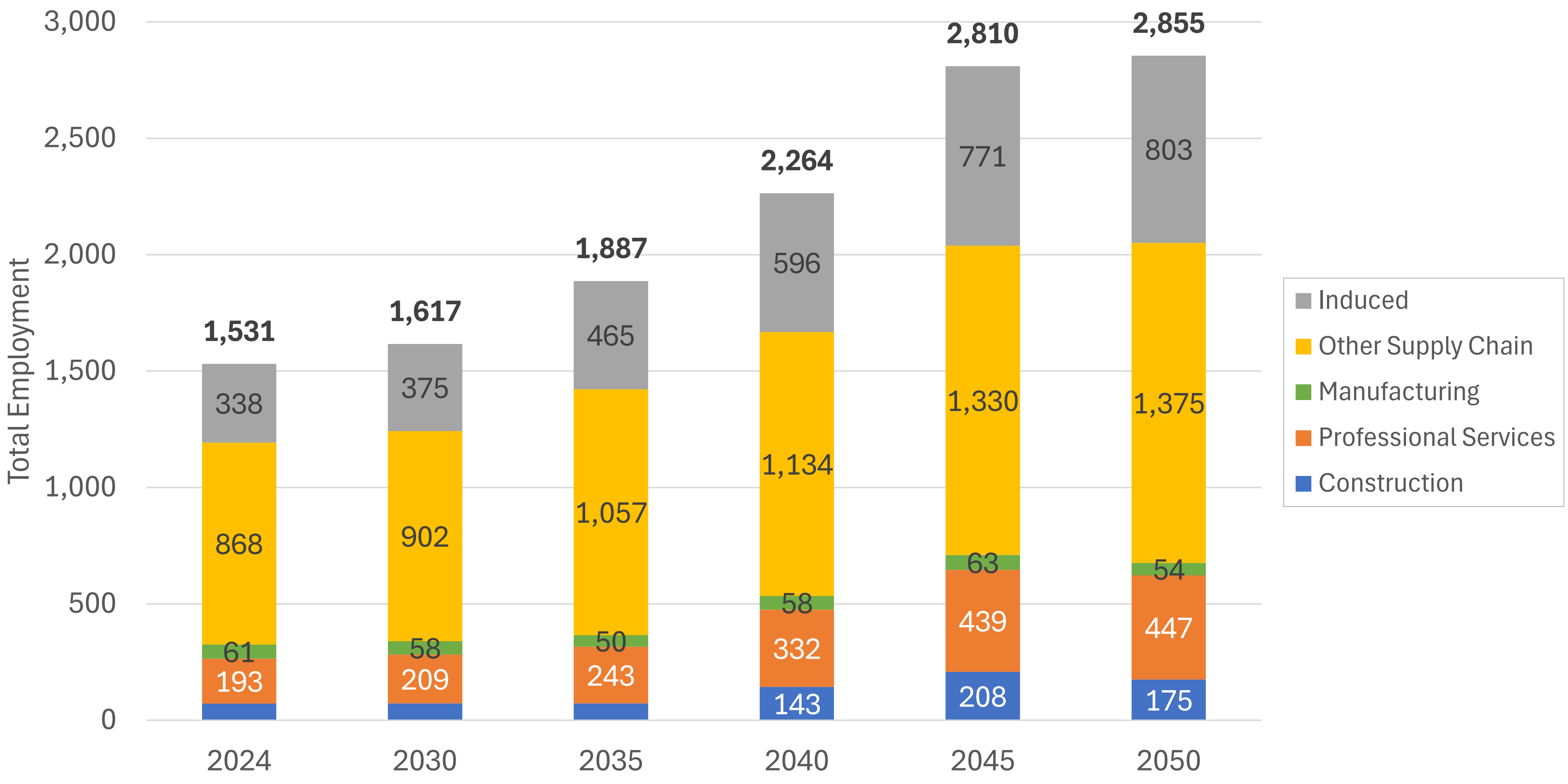
REFERENCE SCENARIO:
GROSS EMPLOYMENT CHANGES FROM 2024,
EAST OREGON



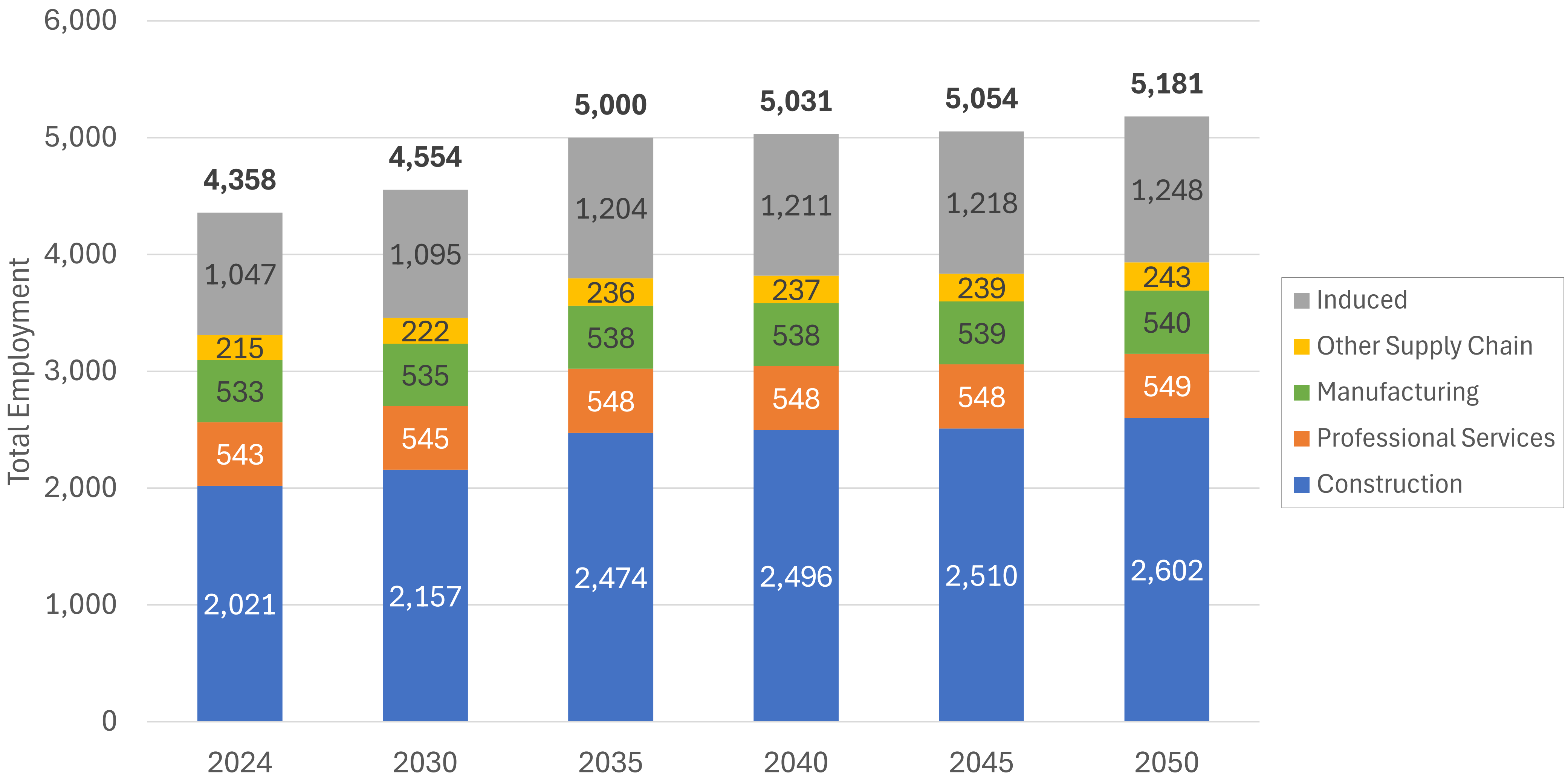
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, ELECTRICITY – TOTALS,** EAST OREGON



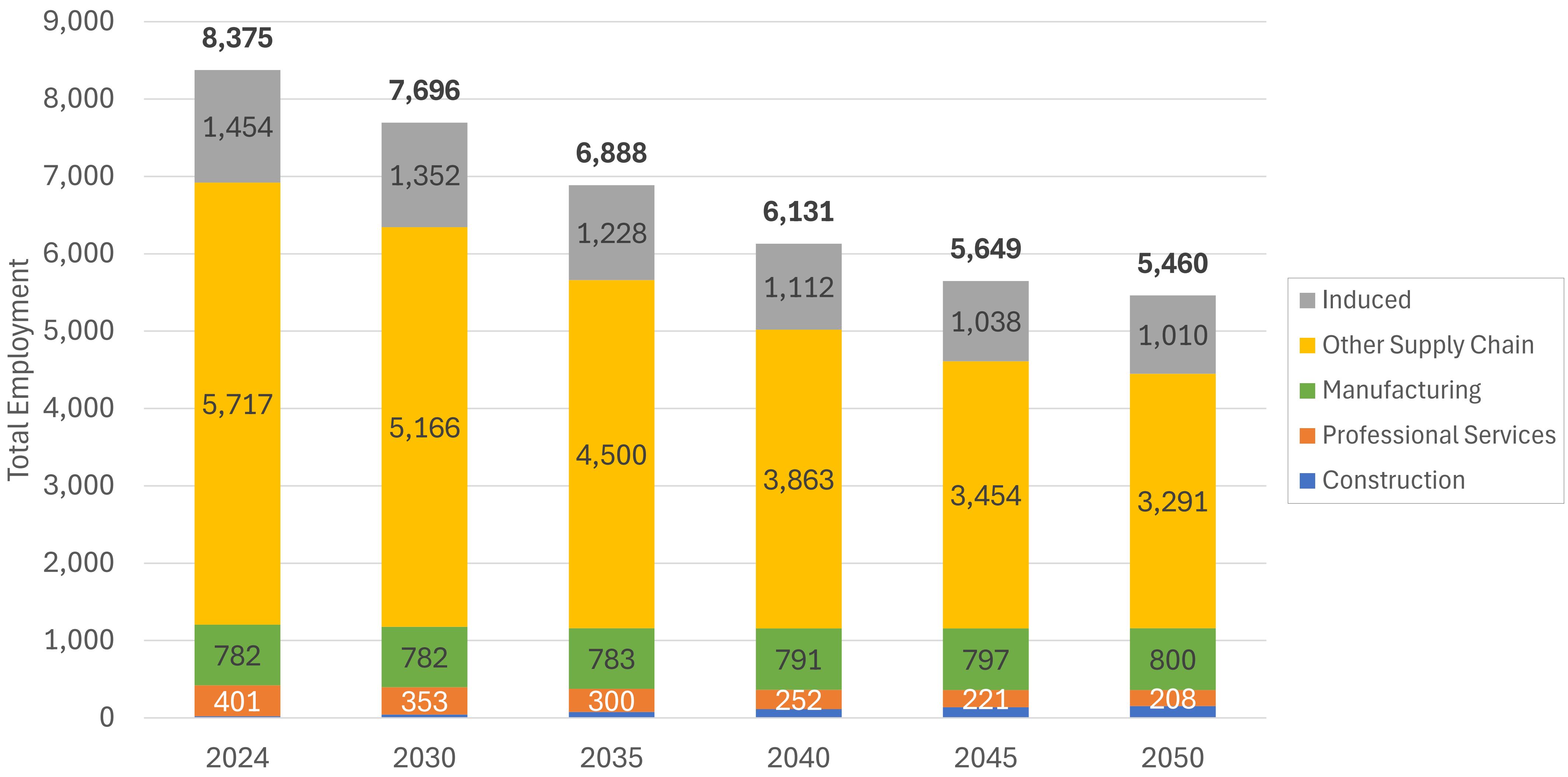
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, FUELS – TOTALS, EAST OREGON**



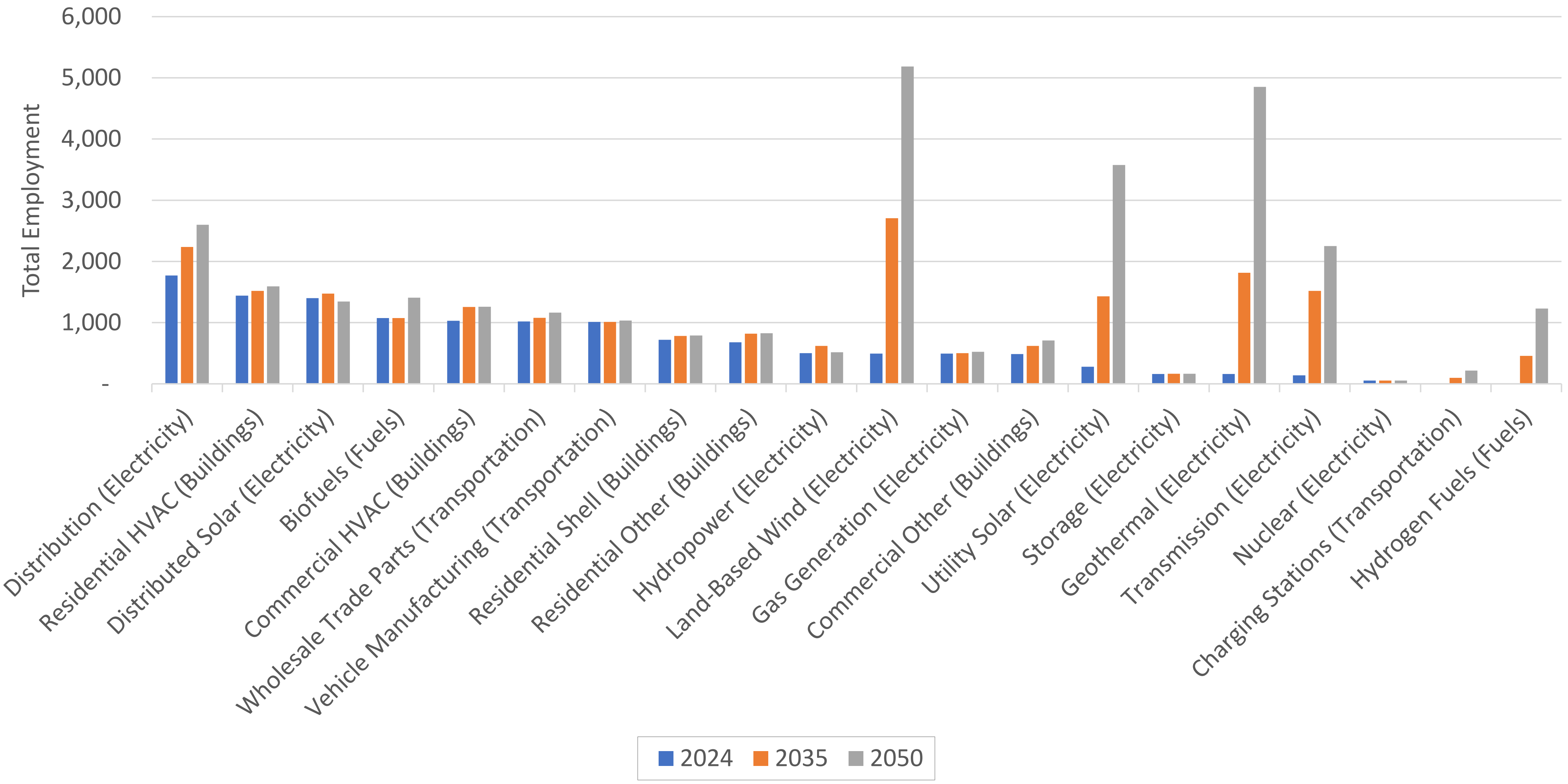
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, BUILDINGS – TOTALS,** EAST OREGON



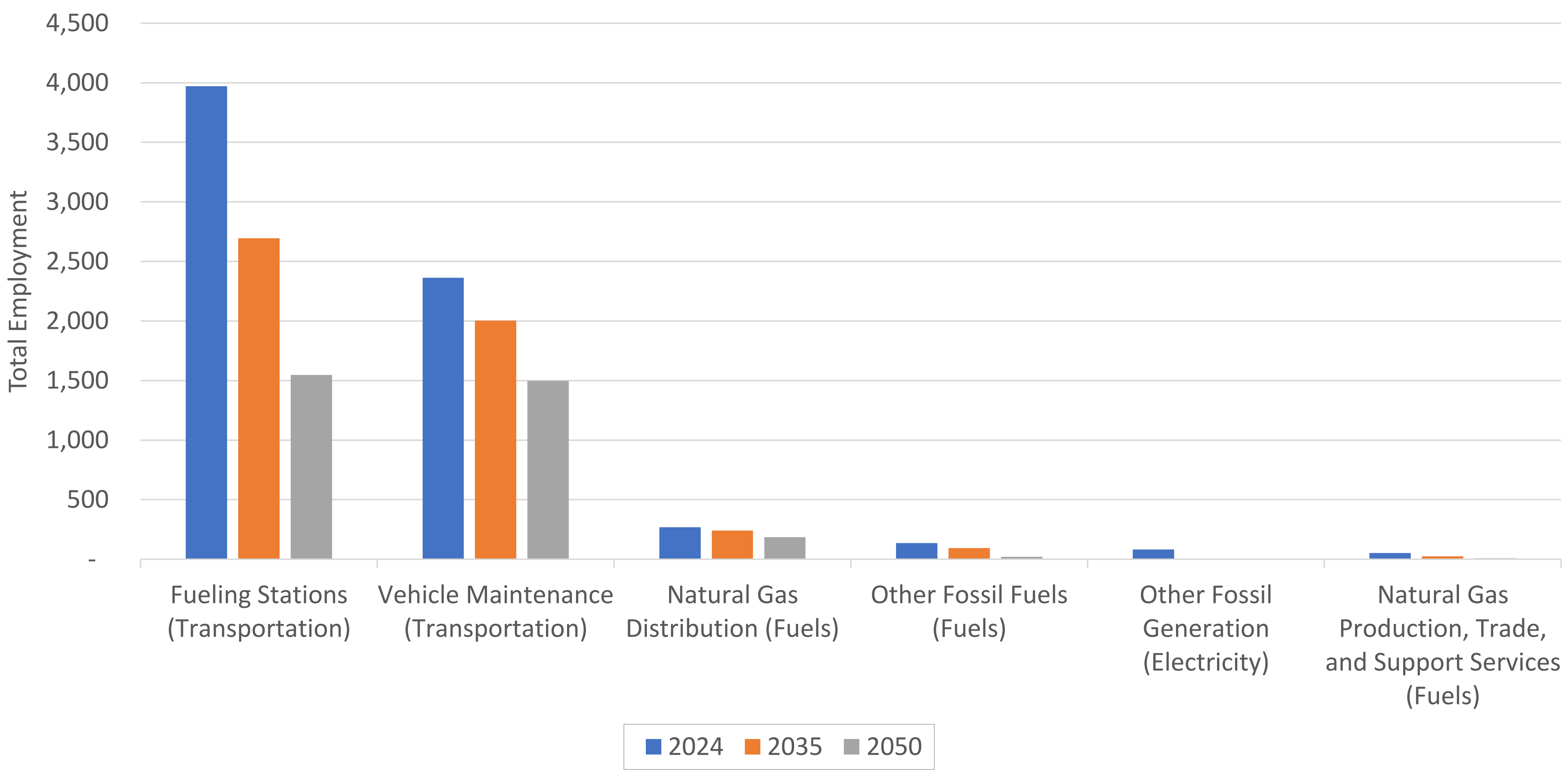
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, TRANSPORTATION – TOTALS,** EAST OREGON



REFERENCE SCENARIO: **GROWTH SUBSECTORS EMPLOYMENT IN 2024, 2035, AND 2050,** EAST OREGON



REFERENCE SCENARIO: **DISPLACED SUBSECTORS EMPLOYMENT IN 2024, 2035, AND 2050,** EAST OREGON



Part 2.3

Reference Scenario Key Findings – West Oregon*

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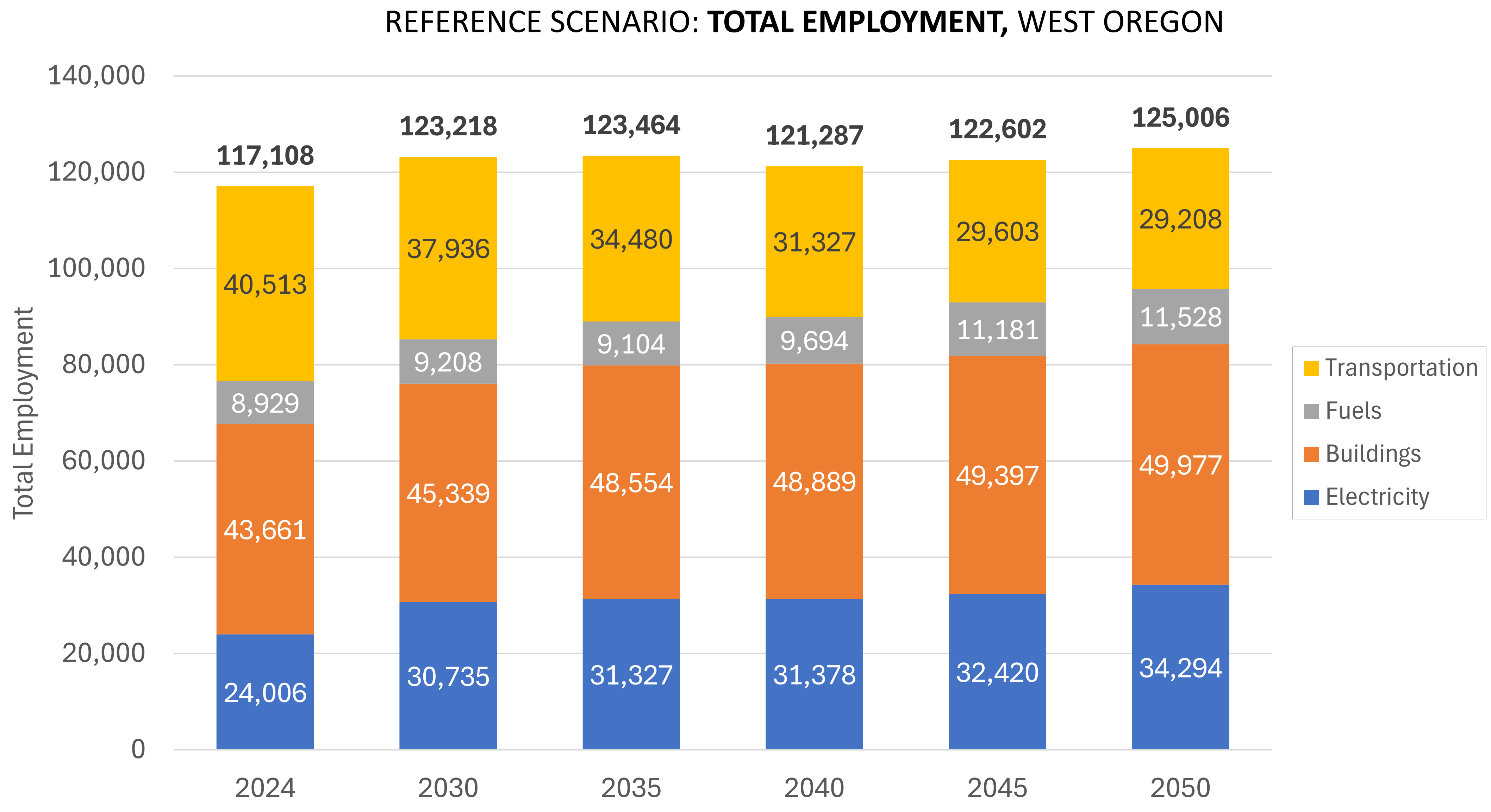
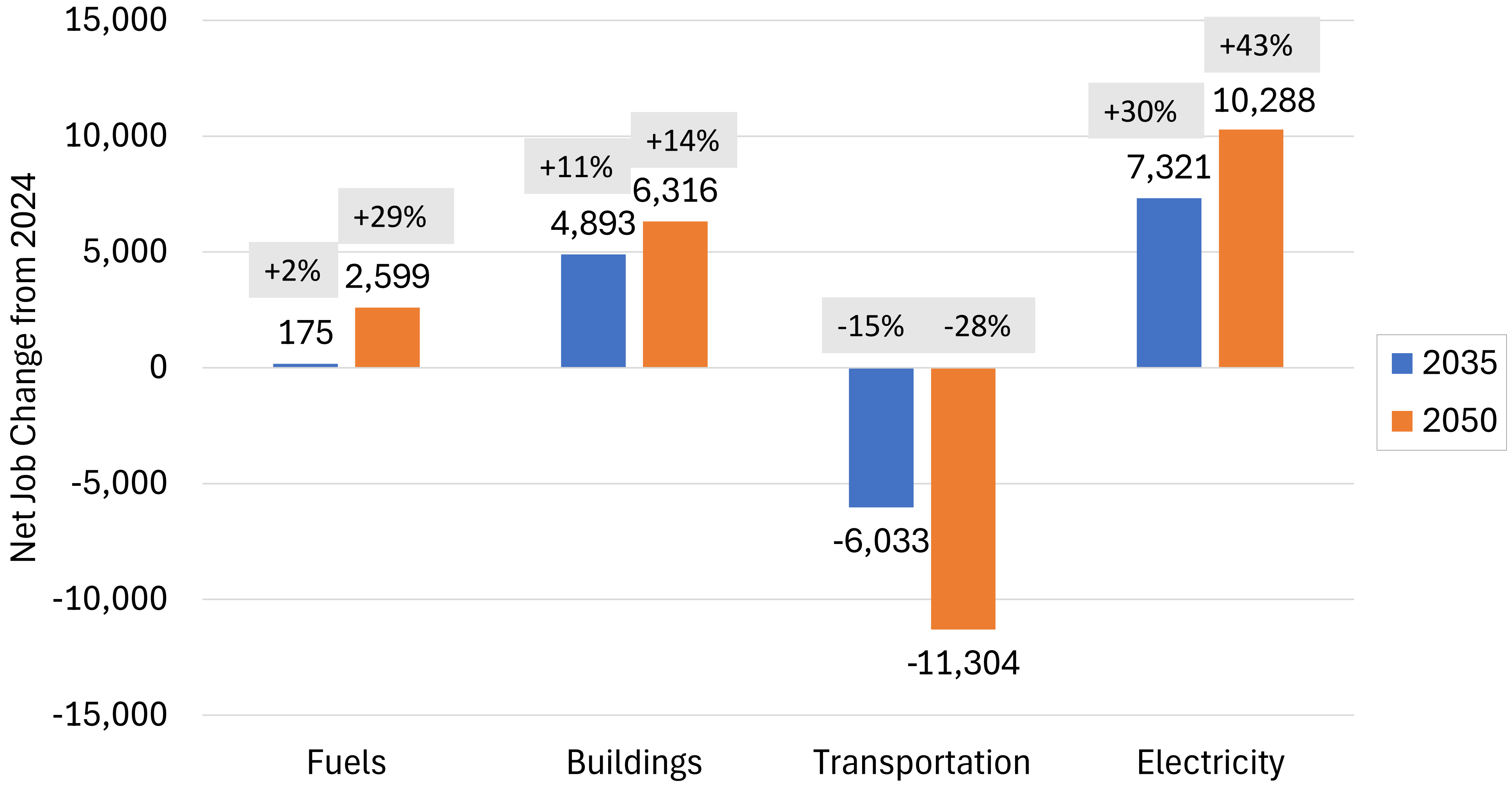
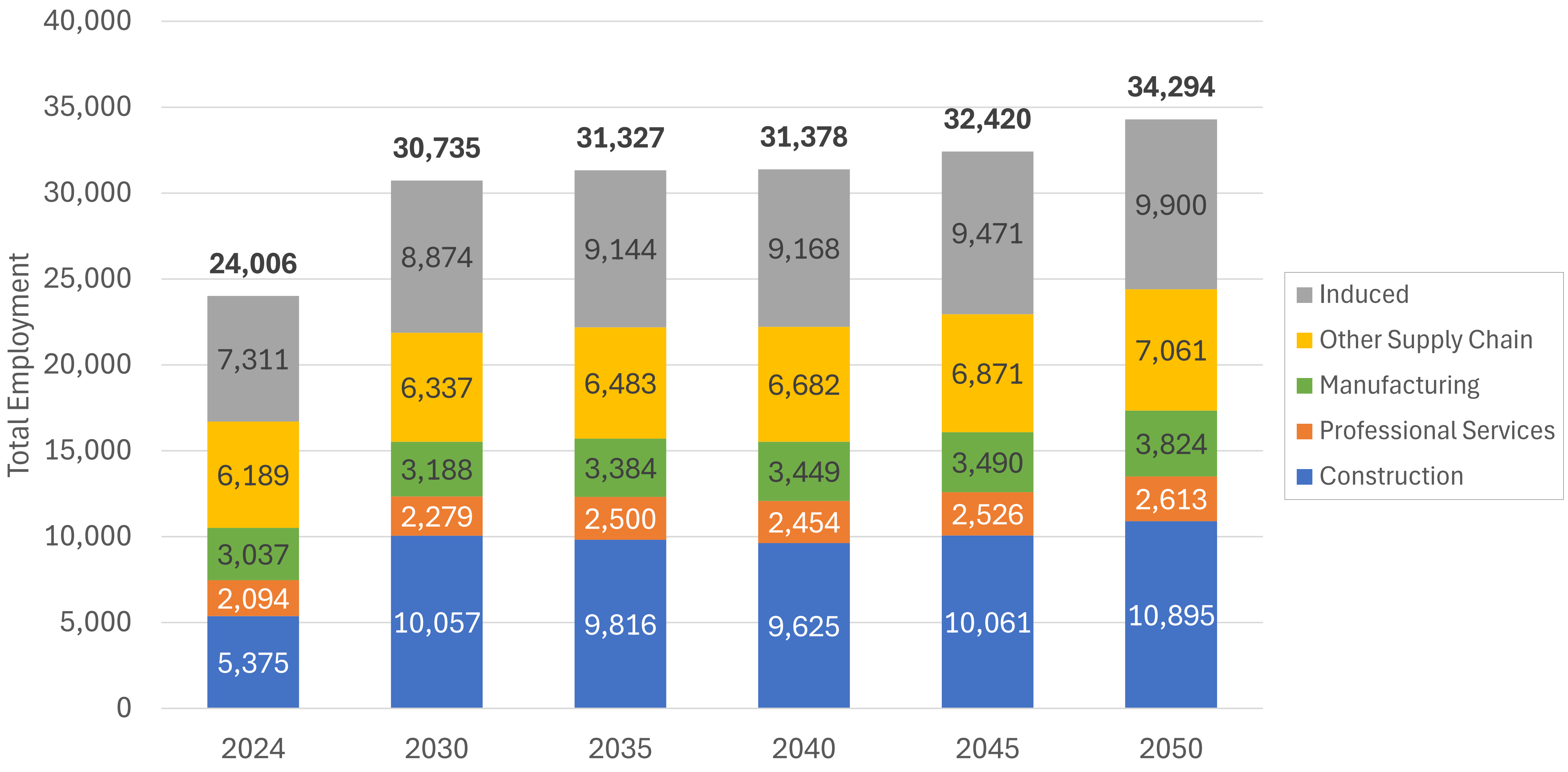

REFERENCE SCENARIO: TOTAL EMPLOYMENT, WEST OREGON
Total Employment
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2024
2030
2035
2040
2045
2050
117,108
123,218
123,464
121,287
122,602
125,006
40,513
37,936
34,480
31,327
29,603
29,208
8,929
9,208
9,104
9,694
11,181
11,528
43,661
45,339
48,554
48,889
49,397
49,977
24,006
30,735
31,327
31,378
32,420
34,294
Transportation
Fuels
Buildings
Electricity

REFERENCE SCENARIO: **NET EMPLOYMENT CHANGES FROM 2024,** WEST OREGON

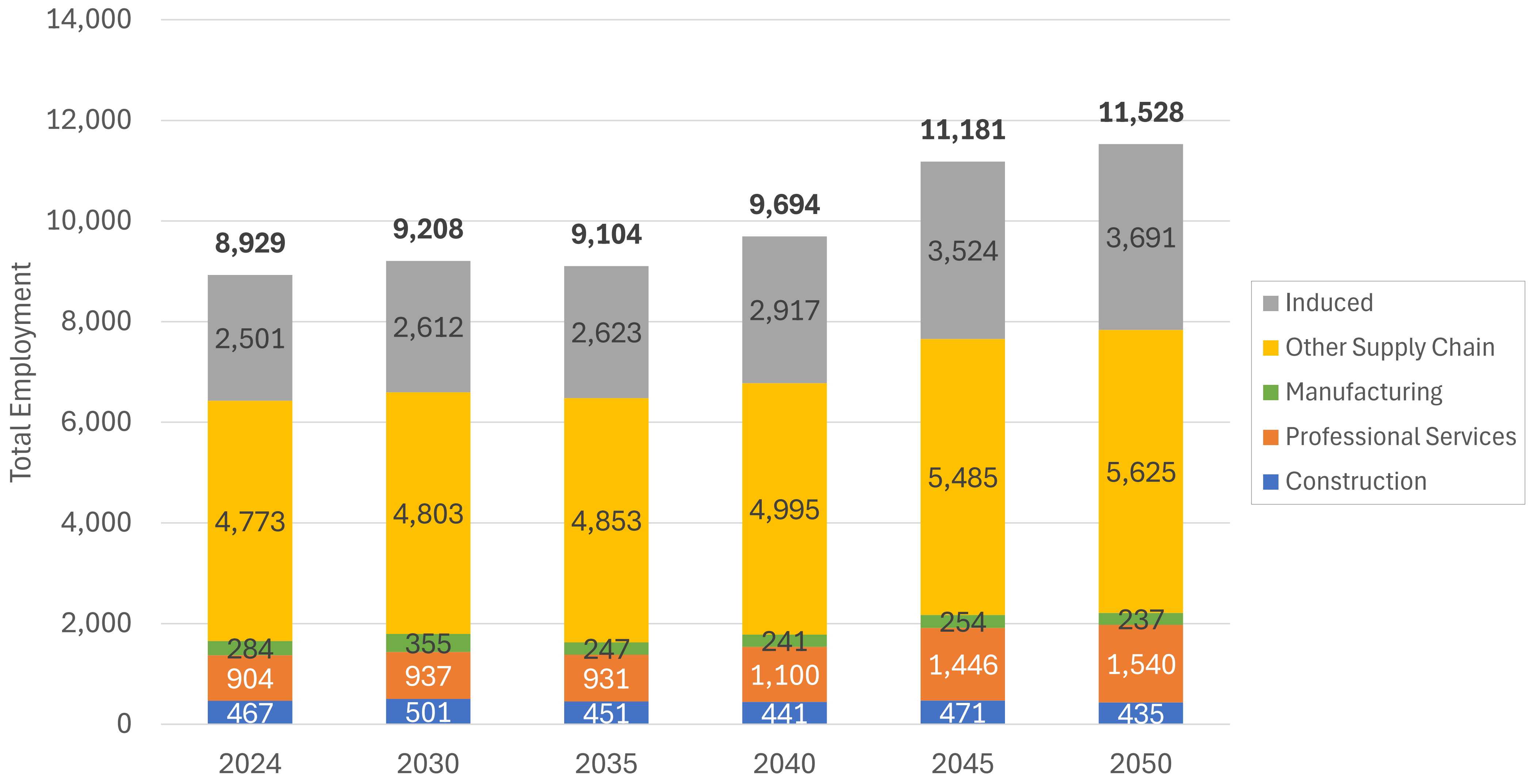


REFERENCE SCENARIO:
GROSS EMPLOYMENT CHANGES FROM 2024,
WEST OREGON

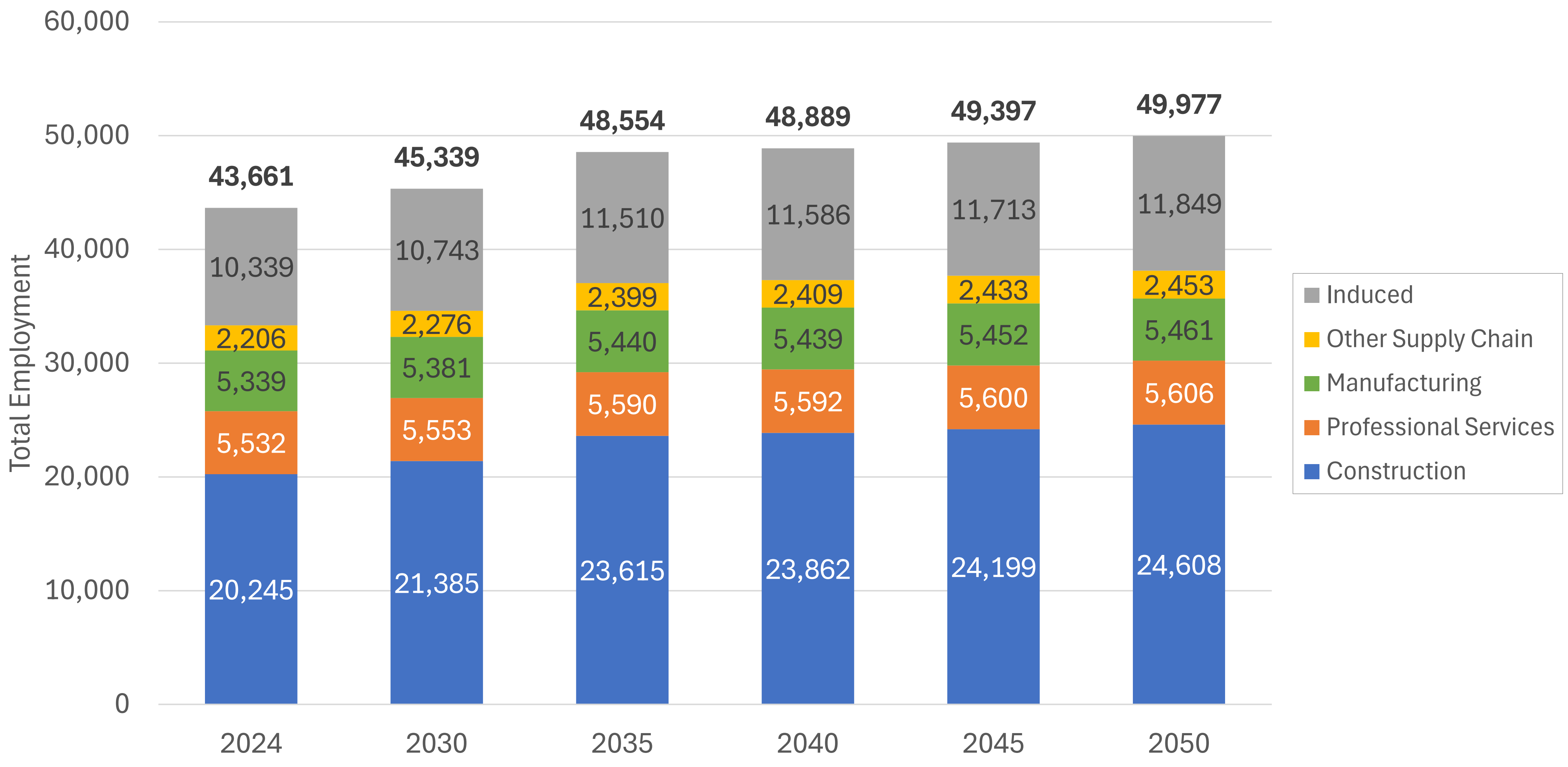
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, ELECTRICITY - TOTALS**, WEST OREGON



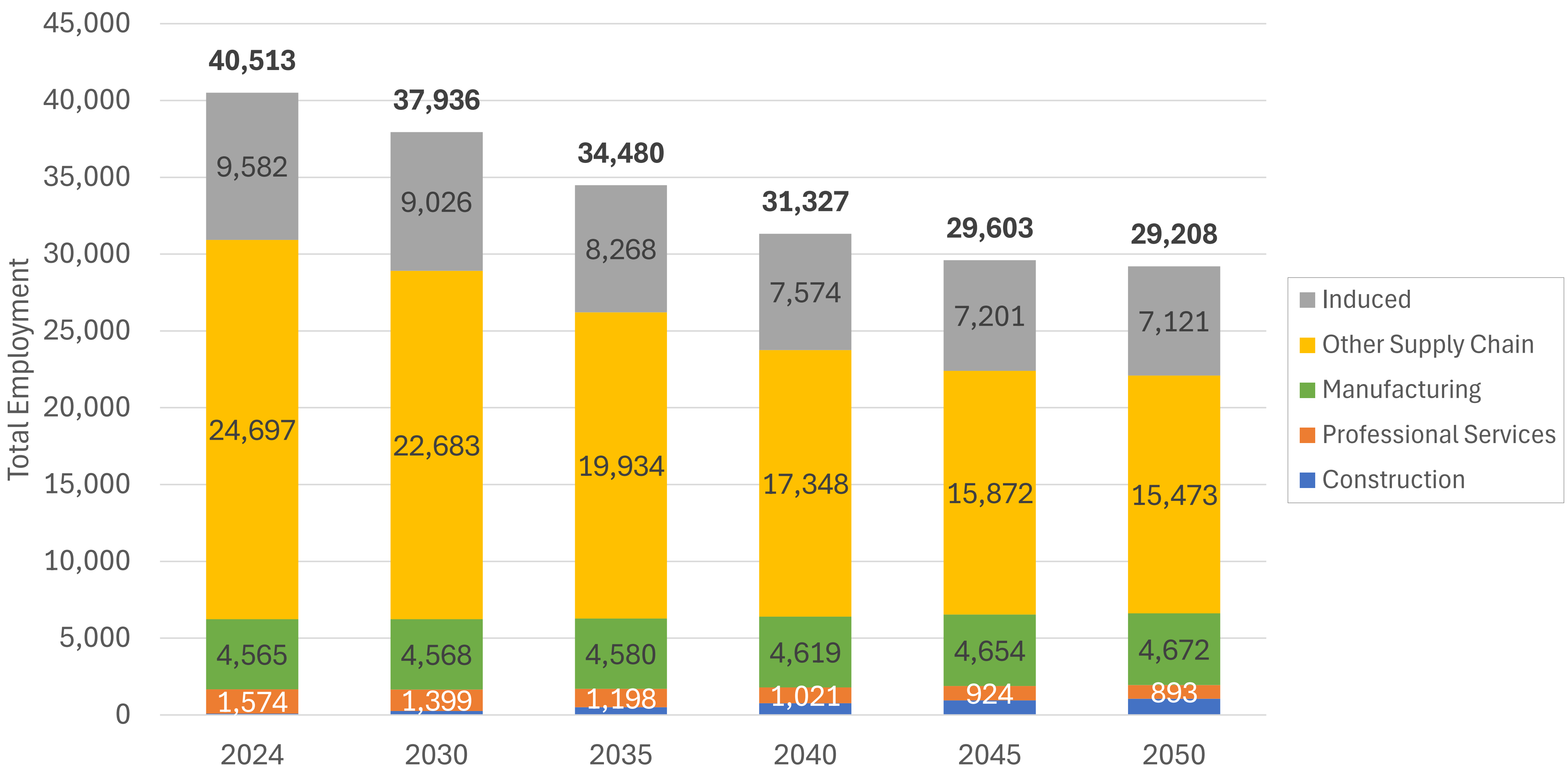
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, FUELS – TOTALS,** WEST OREGON



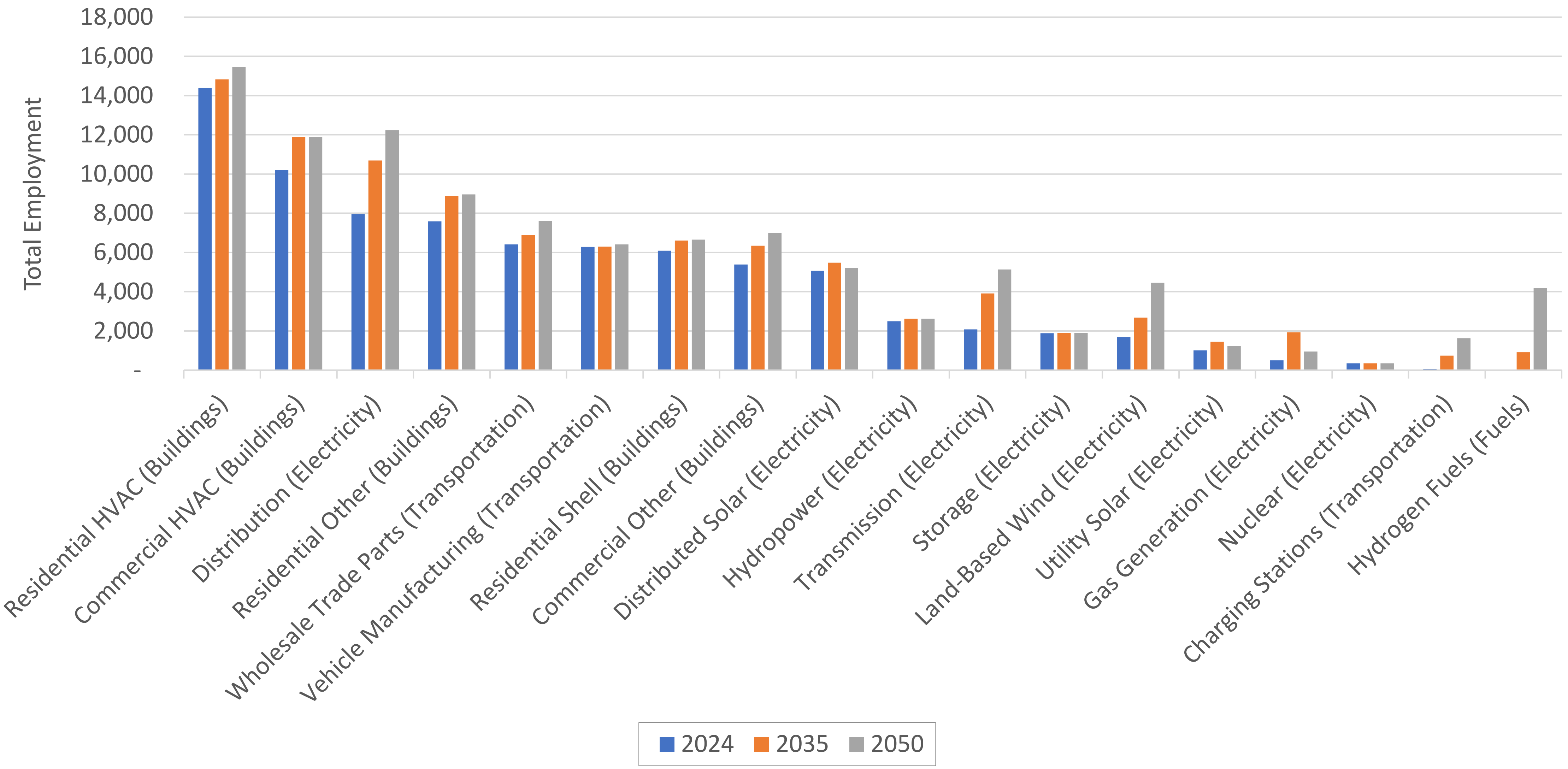
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, BUILDINGS – TOTALS,** WEST OREGON



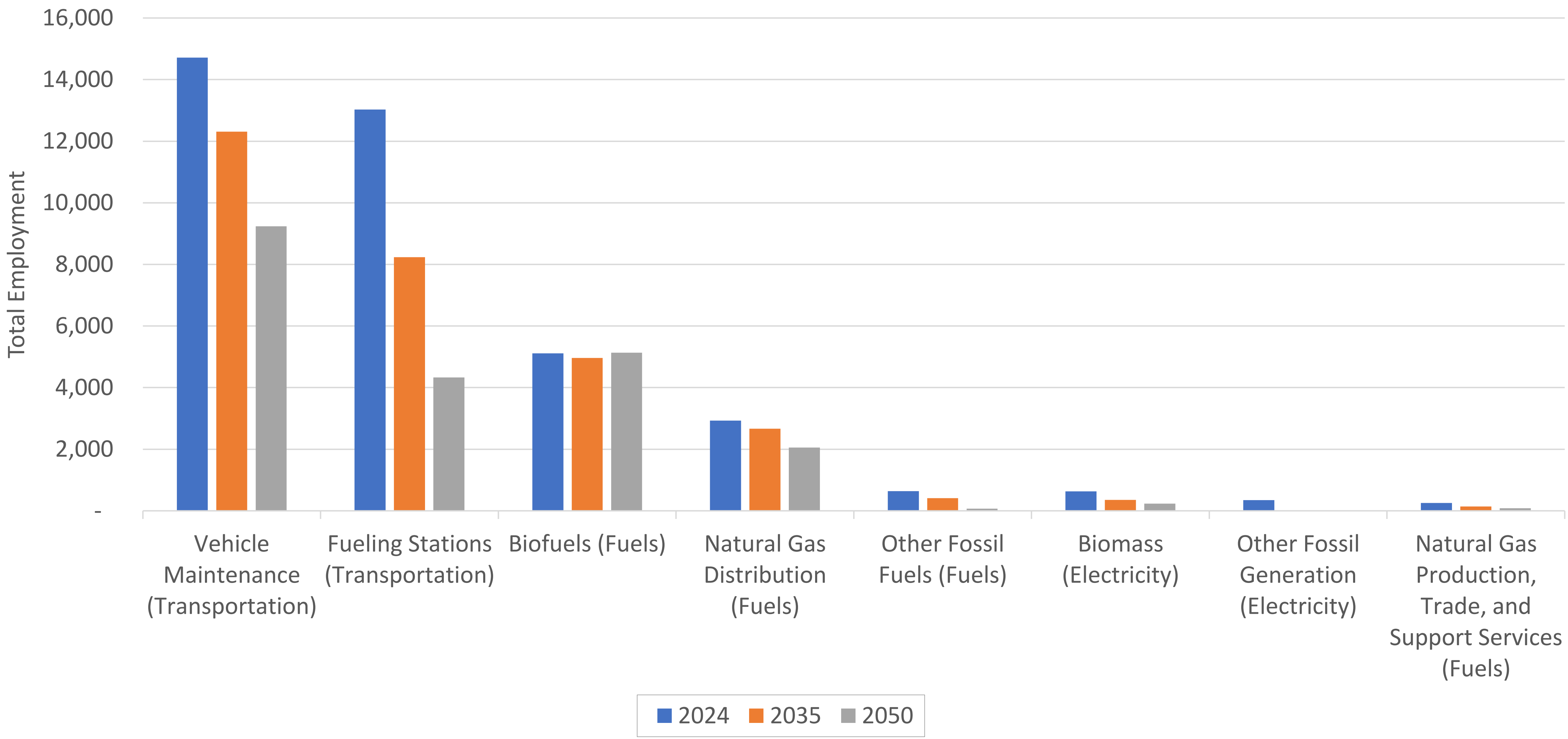
REFERENCE SCENARIO: **INITIAL EMPLOYMENT OUTPUTS, TRANSPORTATION – TOTALS,** WEST OREGON



REFERENCE SCENARIO: **GROWTH SUBSECTORS EMPLOYMENT IN 2024, 2035, AND 2050,** WEST OREGON



REFERENCE SCENARIO: **DISPLACED SUBSECTORS EMPLOYMENT IN 2024, 2035, AND 2050,** WEST OREGON



Part 3

Reference Scenario Initial Employment Outputs (IEOs)

Oregon Energy Strategy

Part 3: Initial Employment Outputs

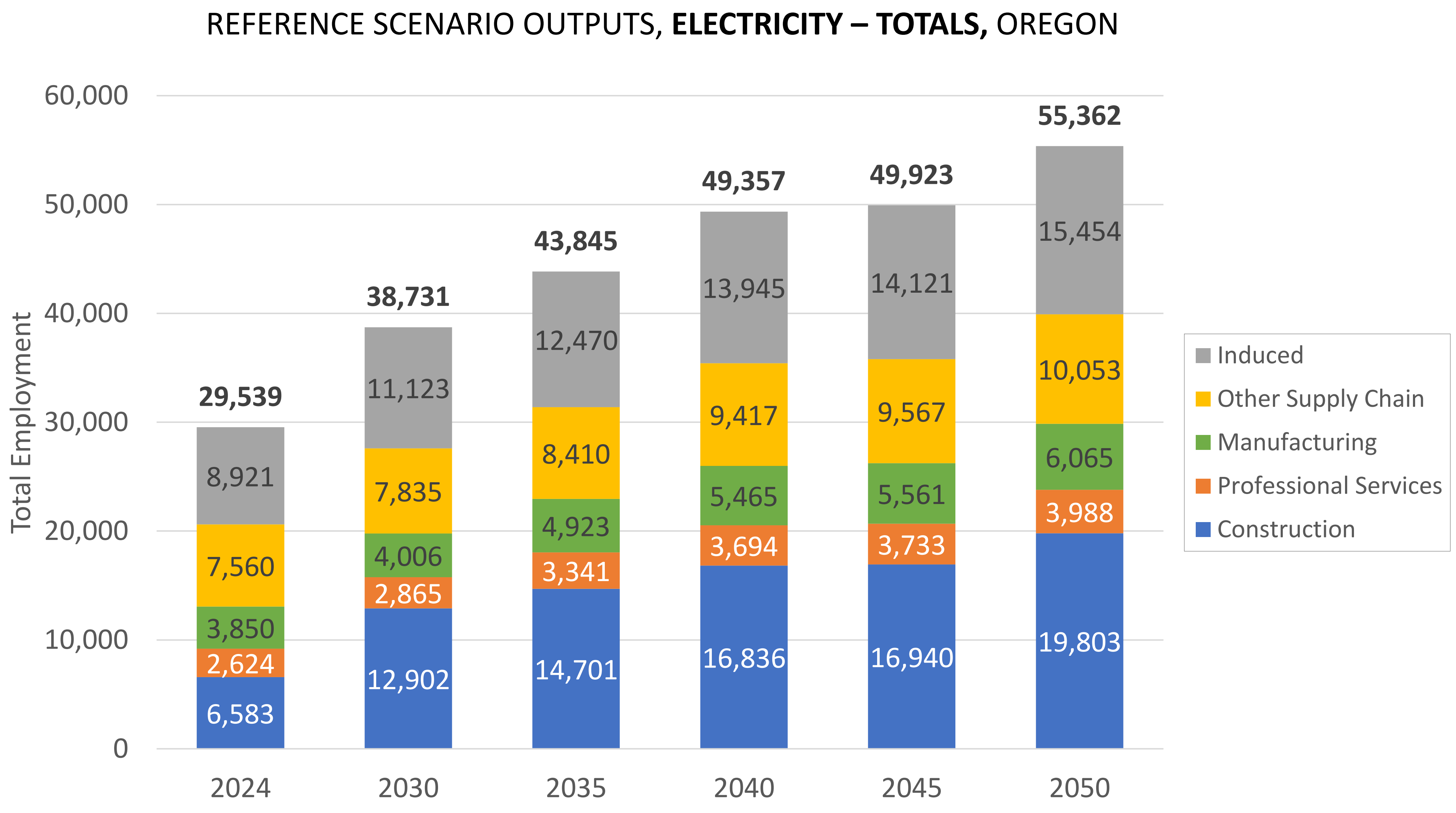
Electricity

II. Electricity

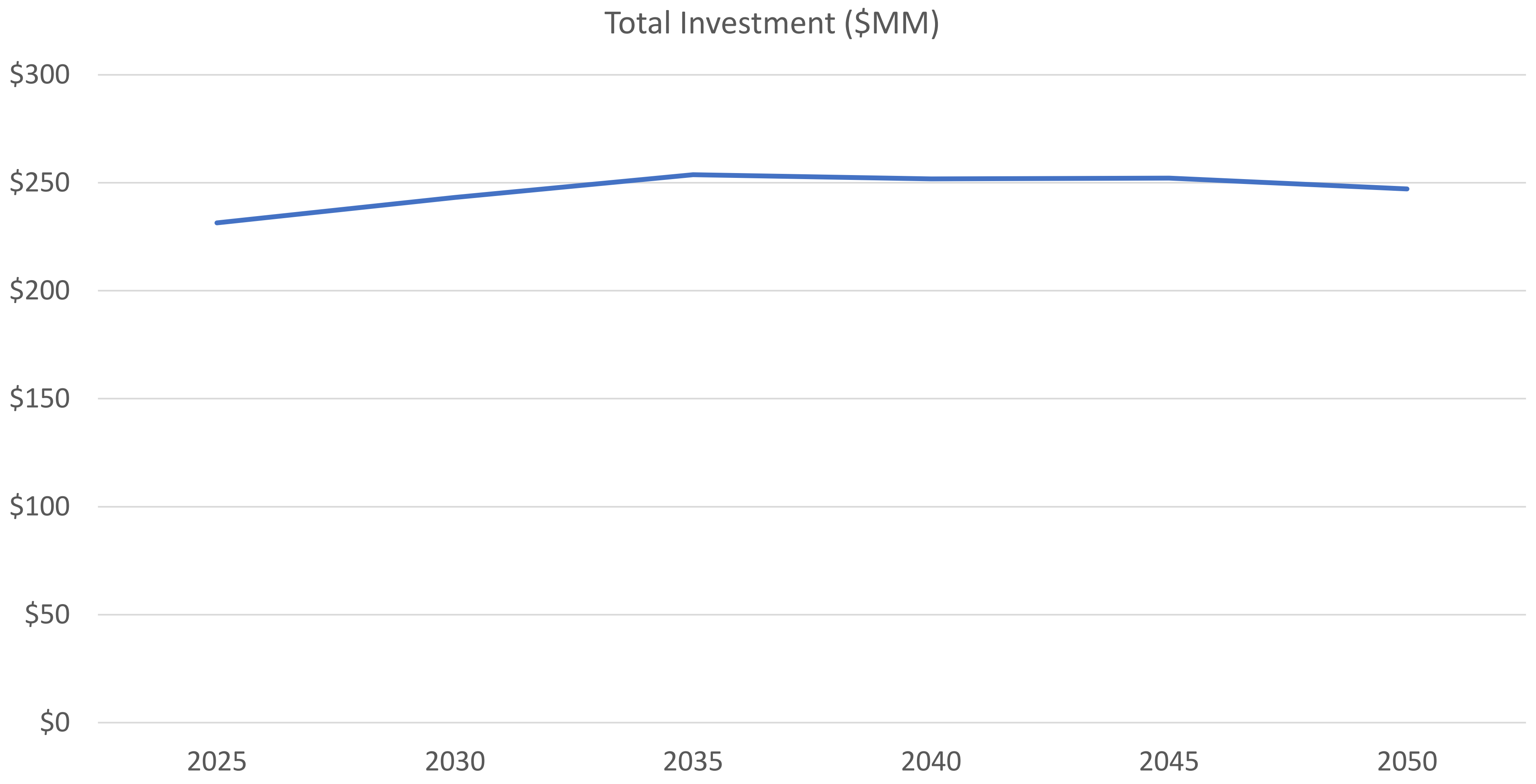
1. Distributed Solar
2. Distribution
3. Hydropower
4. Land-Based Wind
5. Gas Generation
6. Nuclear
7. Other Fossil Generation
8. Other Renewable Generation - Biomass
9. Other Renewable Generation - Geothermal
10. Storage
11. Transmission
12. Utility Solar

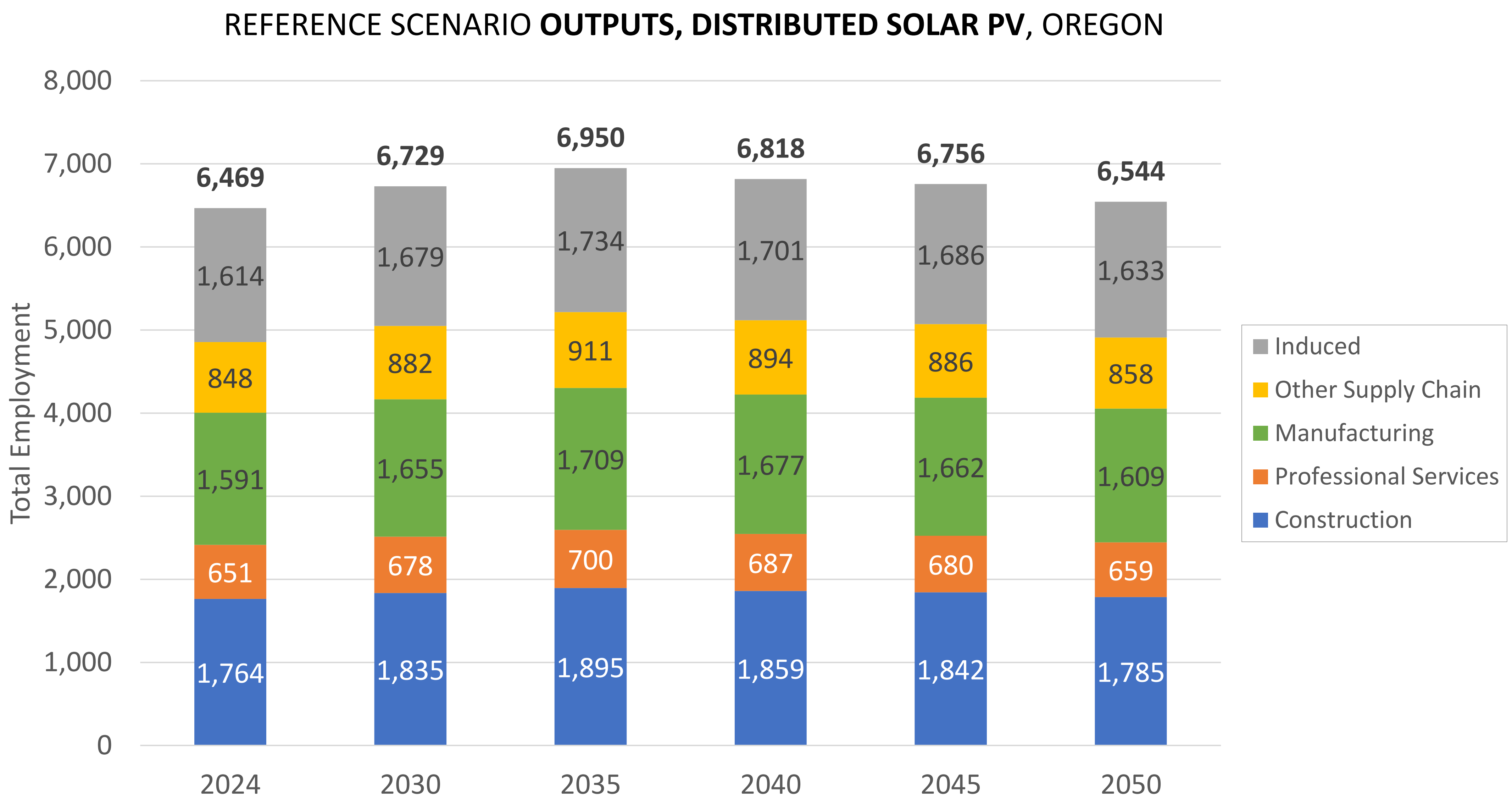
ELECTRICITY: REFERENCE, OREGON

SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Distribution	9,728	12,300	12,921	13,677	14,392	14,831
Hydropower	2,995	3,738	3,240	3,134	3,133	3,133
Land-Based Wind	2,188	2,647	5,380	7,236	7,811	9,643
Gas Generation	990	990	2,433	1,597	1,781	1,471
Nuclear	401	401	401	401	401	401
Other Ren. Gen. – Geothermal	160	161	1,814	5,791	4,142	4,853
Storage	2,045	2,124	2,055	2,054	2,050	2,061
Transmission	2,220	4,381	5,427	5,454	6,135	7,391
Utility Solar	1,288	4,868	2,872	2,843	3,089	4,802
Distributed Solar	6,469	6,729	6,950	6,818	6,756	6,544
Sub-total	**28,482**	**38,339**	**43,493**	**49,004**	**49,691**	**55,129**
Change		**9,856**	**15,011**	**20,522**	**21,208**	**26,646**
Displacement Sub-Sectors						
Other Fossil Generation	427	41	0	0	0	0
Other Ren. Gen. – Biomass	630	352	352	353	232	233
Sub-total	**1,057**	**393**	**352**	**353**	**232**	**233**
Change		**-664**	**-705**	**-704**	**-825**	**-824**
Electricity OVERALL	**29,539**	**38,731**	**43,845**	**49,357**	**49,923**	**55,362**
Net Change from 2024		**9,192**	**14,306**	**19,818**	**20,384**	**25,823**

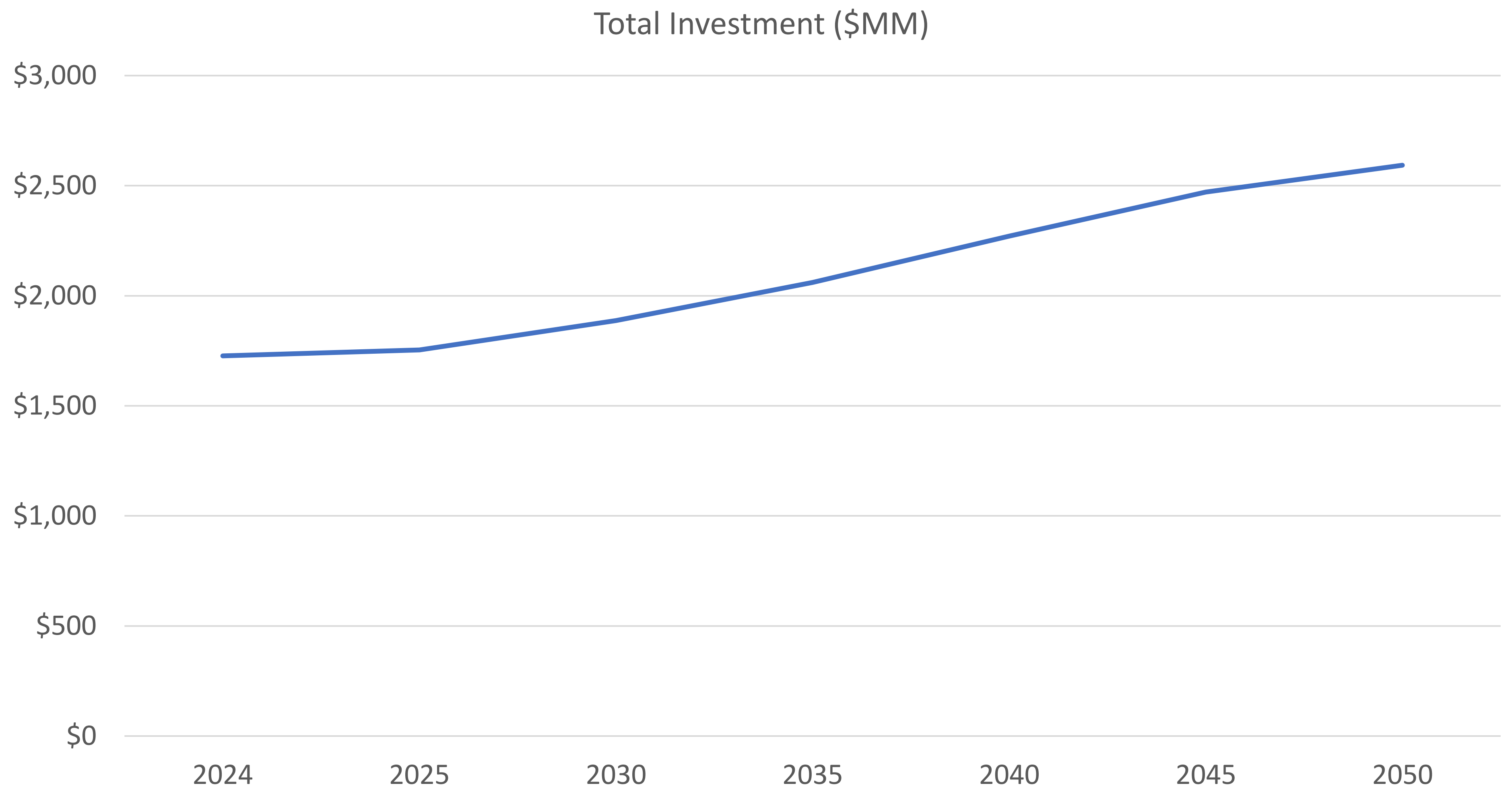

REFERENCE SCENARIO OUTPUTS, ELECTRICITY – TOTALS, OREGON
60,000
50,000
40,000
30,000
20,000
10,000
0
Total Employment
2024
2030
2035
2040
2045
2050
29,539
38,731
43,845
49,357
49,923
55,362
8,921
7,560
3,850
2,624
6,583
11,123
7,835
4,006
2,865
12,902
12,470
8,410
4,923
3,341
14,701
13,945
9,417
5,465
3,694
16,836
14,121
9,567
5,561
3,733
16,940
15,454
10,053
6,065
3,988
19,803
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

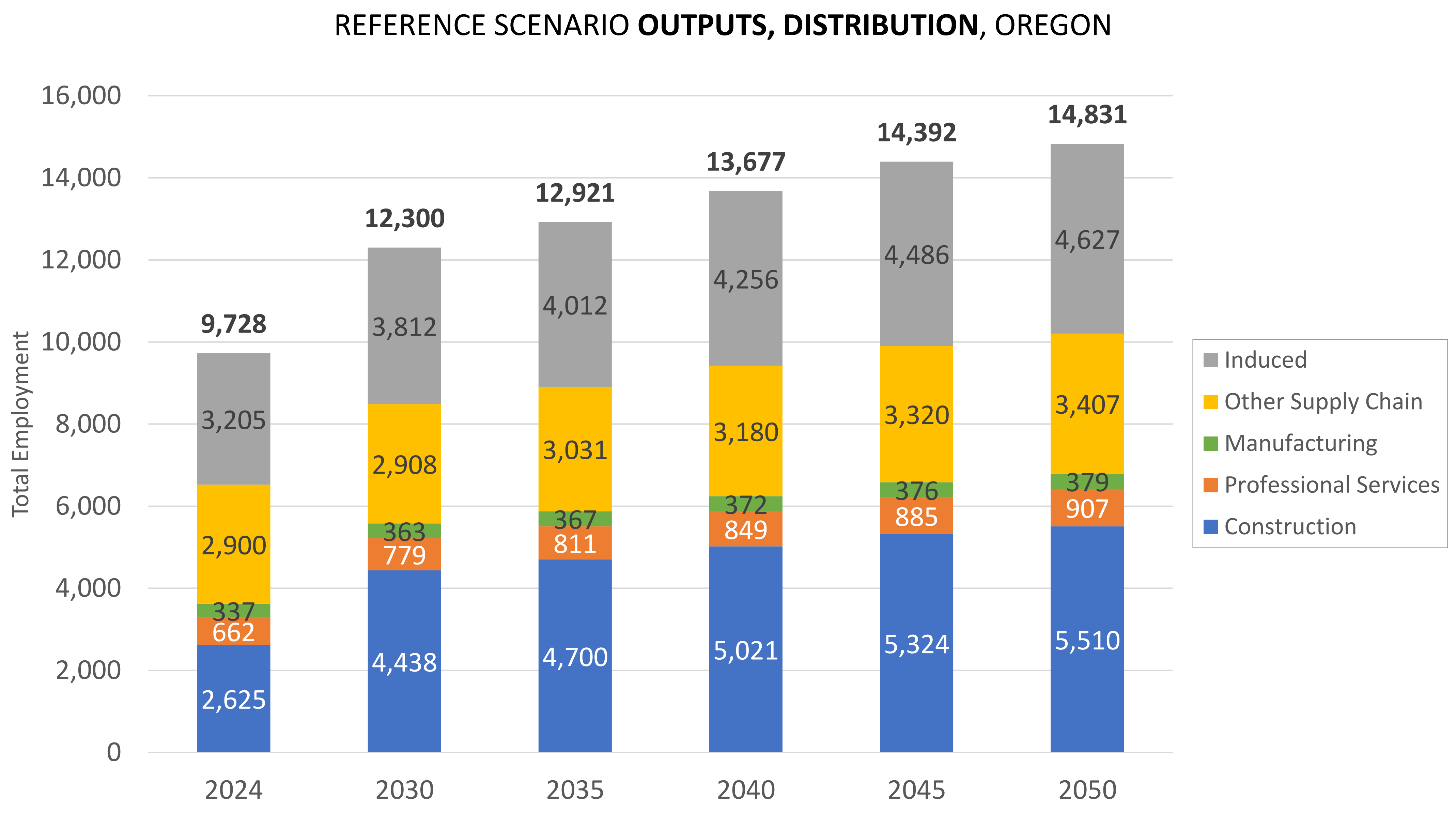
REFERENCE SCENARIO **INPUTS, DISTRIBUTED SOLAR PV,** OREGON



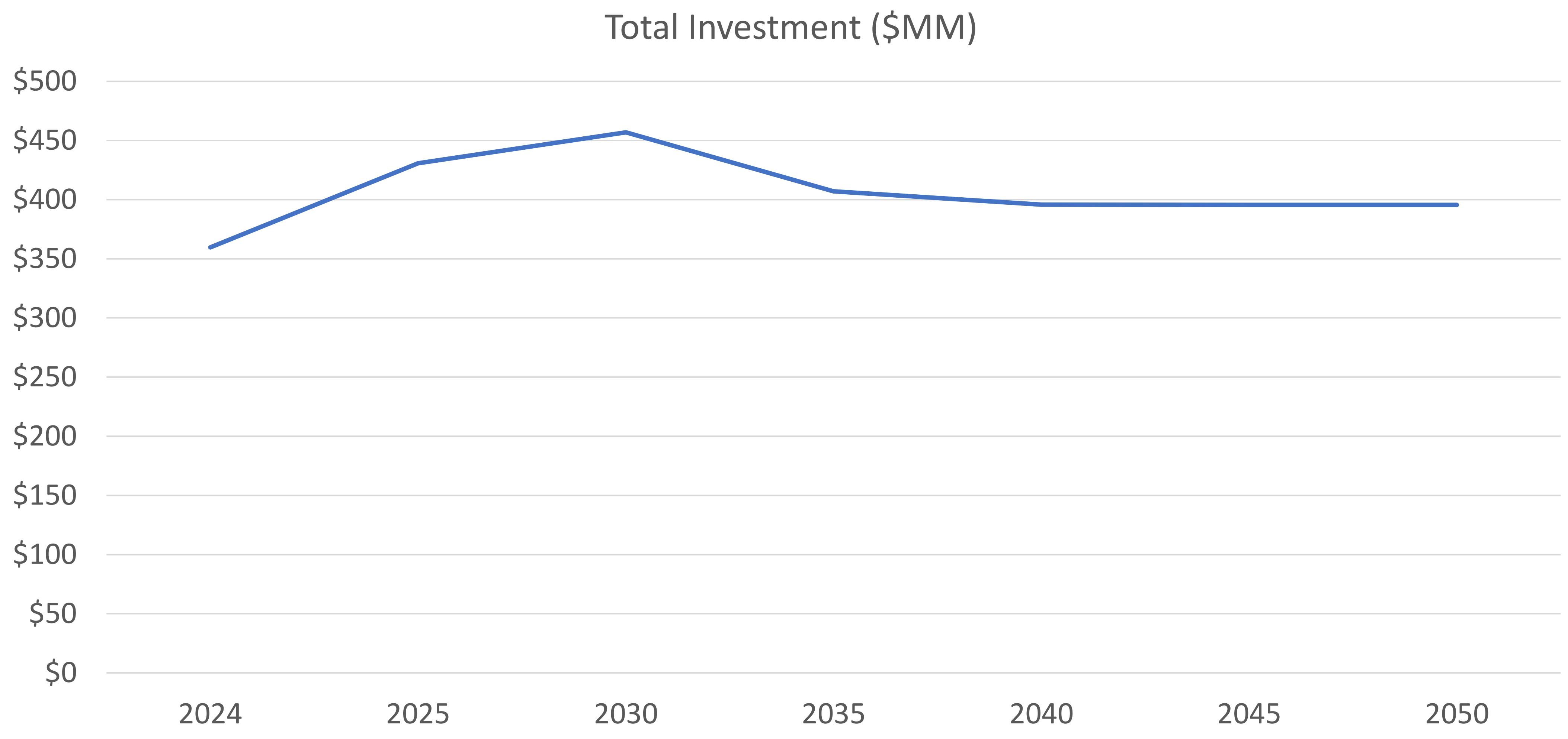

REFERENCE SCENARIO **OUTPUTS, DISTRIBUTED SOLAR PV**, OREGON
Total Employment
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2024
2030
2035
2040
2045
2050
6,469
6,729
6,950
6,818
6,756
6,544
1,614
1,679
1,734
1,701
1,686
1,633
848
882
911
894
886
858
1,591
1,655
1,709
1,677
1,662
1,609
651
678
700
687
680
659
1,764
1,835
1,895
1,859
1,842
1,785
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

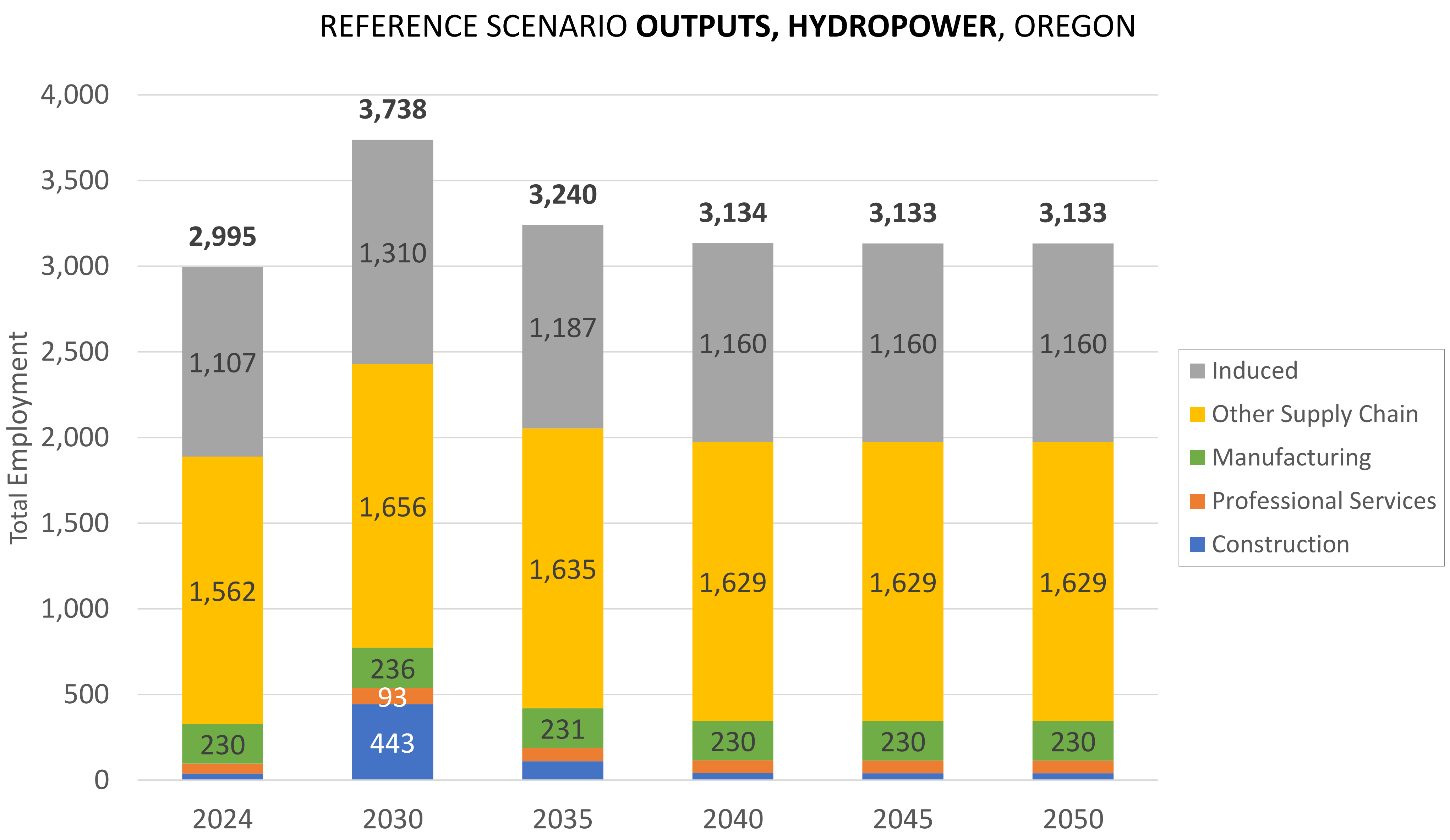
REFERENCE SCENARIO **INPUTS, DISTRIBUTION**, OREGON



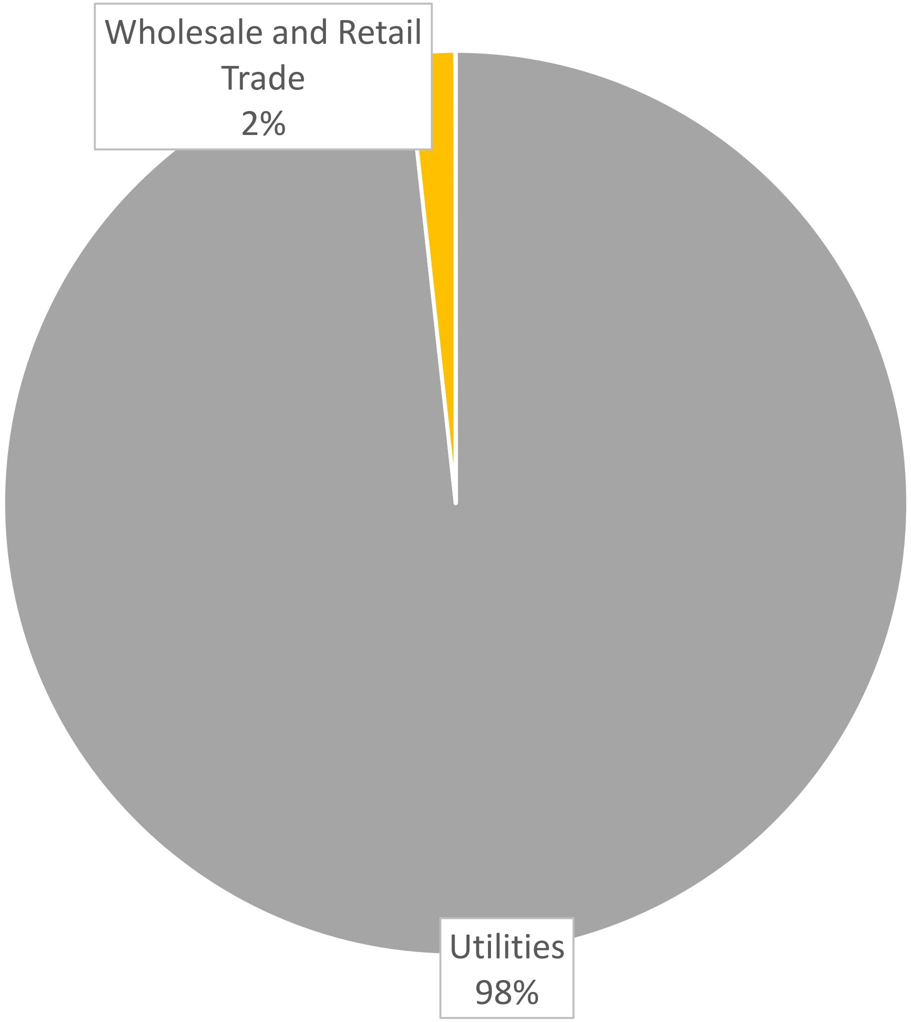

REFERENCE SCENARIO **OUTPUTS, DISTRIBUTION**, OREGON
Total Employment
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2024
2030
2035
2040
2045
2050
9,728
12,300
12,921
13,677
14,392
14,831
3,205
2,900
337
662
2,625
3,812
2,908
363
779
4,438
4,012
3,031
367
811
4,700
4,256
3,180
372
849
5,021
4,486
3,320
376
885
5,324
4,627
3,407
379
907
5,510
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, HYDROPOWER**, OREGON

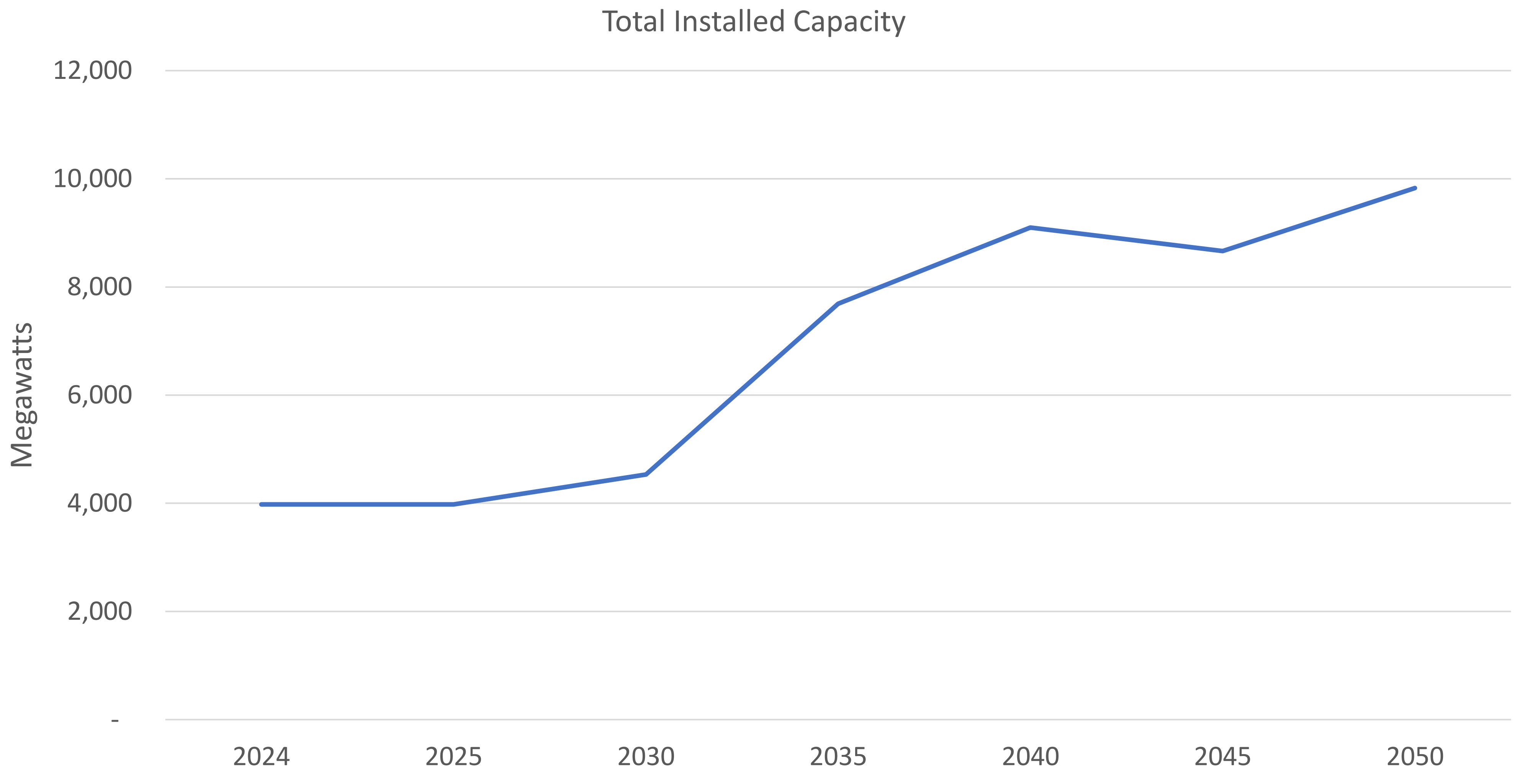


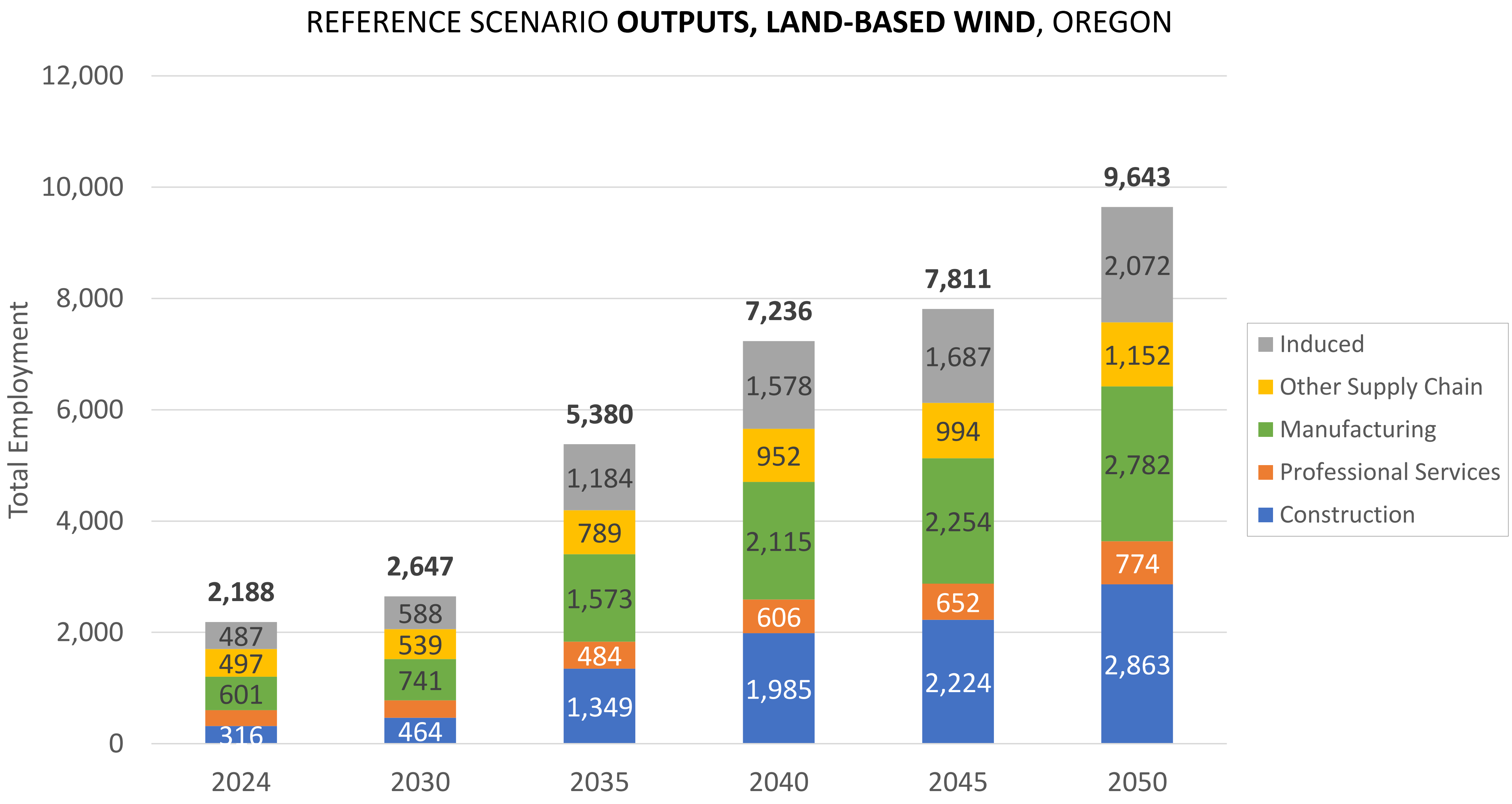

REFERENCE SCENARIO OUTPUTS, HYDROPOWER, OREGON
Total Employment
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2,995
1,107
1,562
230
3,738
1,310
1,656
236
93
443
3,240
1,187
1,635
231
3,134
1,160
1,629
230
3,133
1,160
1,629
230
3,133
1,160
1,629
230
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

OTHER SUPPLY CHAIN BREAKOUT**, HYDROPOWER**, OREGON

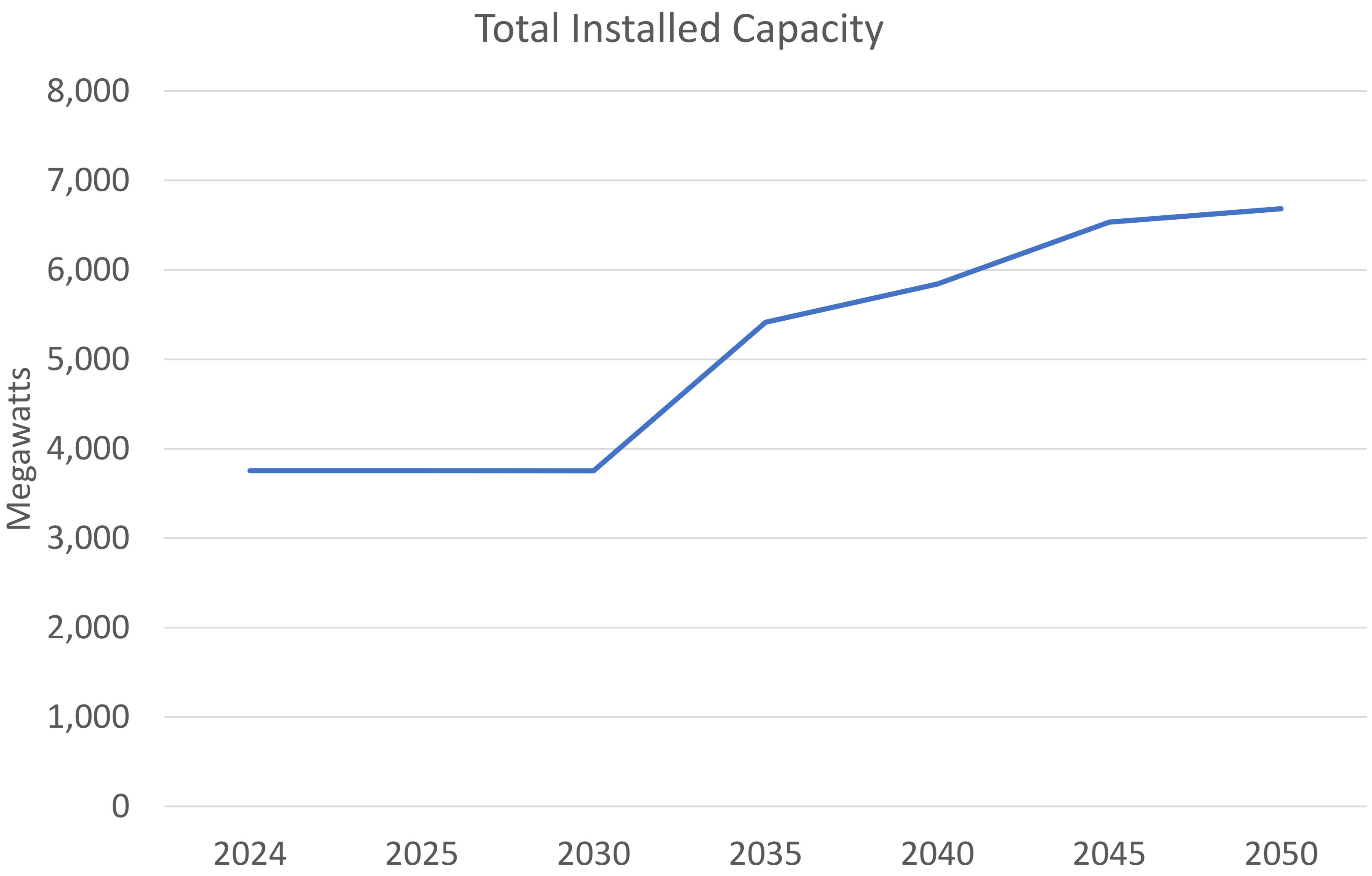


REFERENCE SCENARIO **INPUTS, LAND-BASED WIND**, OREGON



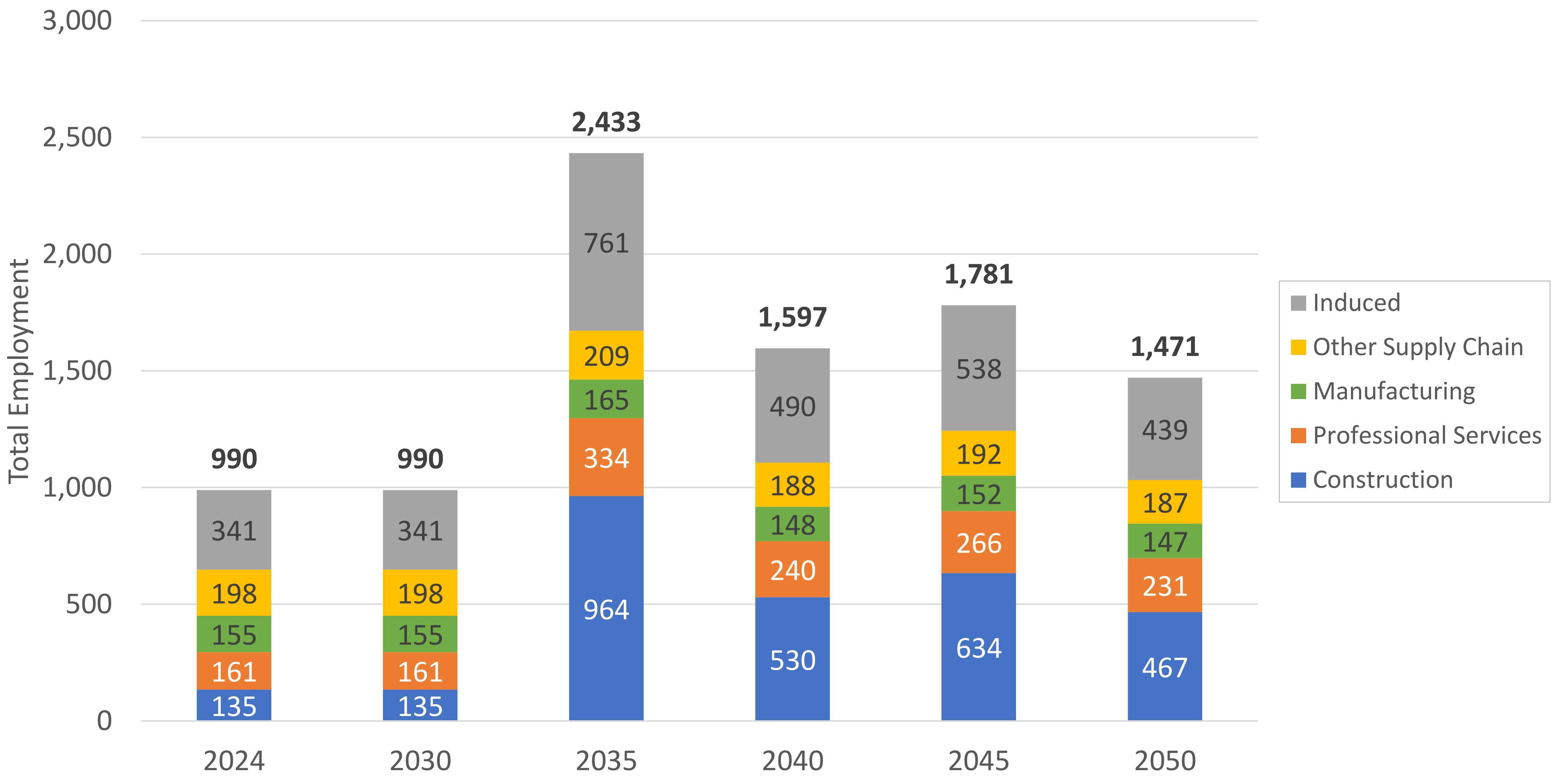

REFERENCE SCENARIO OUTPUTS, LAND-BASED WIND, OREGON
Total Employment
12,000
10,000
8,000
6,000
4,000
2,000
0
2024
2030
2035
2040
2045
2050
2,188
487
497
601
316
2,647
588
539
741
464
5,380
1,184
789
1,573
484
1,349
7,236
1,578
952
2,115
606
1,985
7,811
1,687
994
2,254
652
2,224
9,643
2,072
1,152
2,782
774
2,863
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, GAS GENERATION**, OREGON

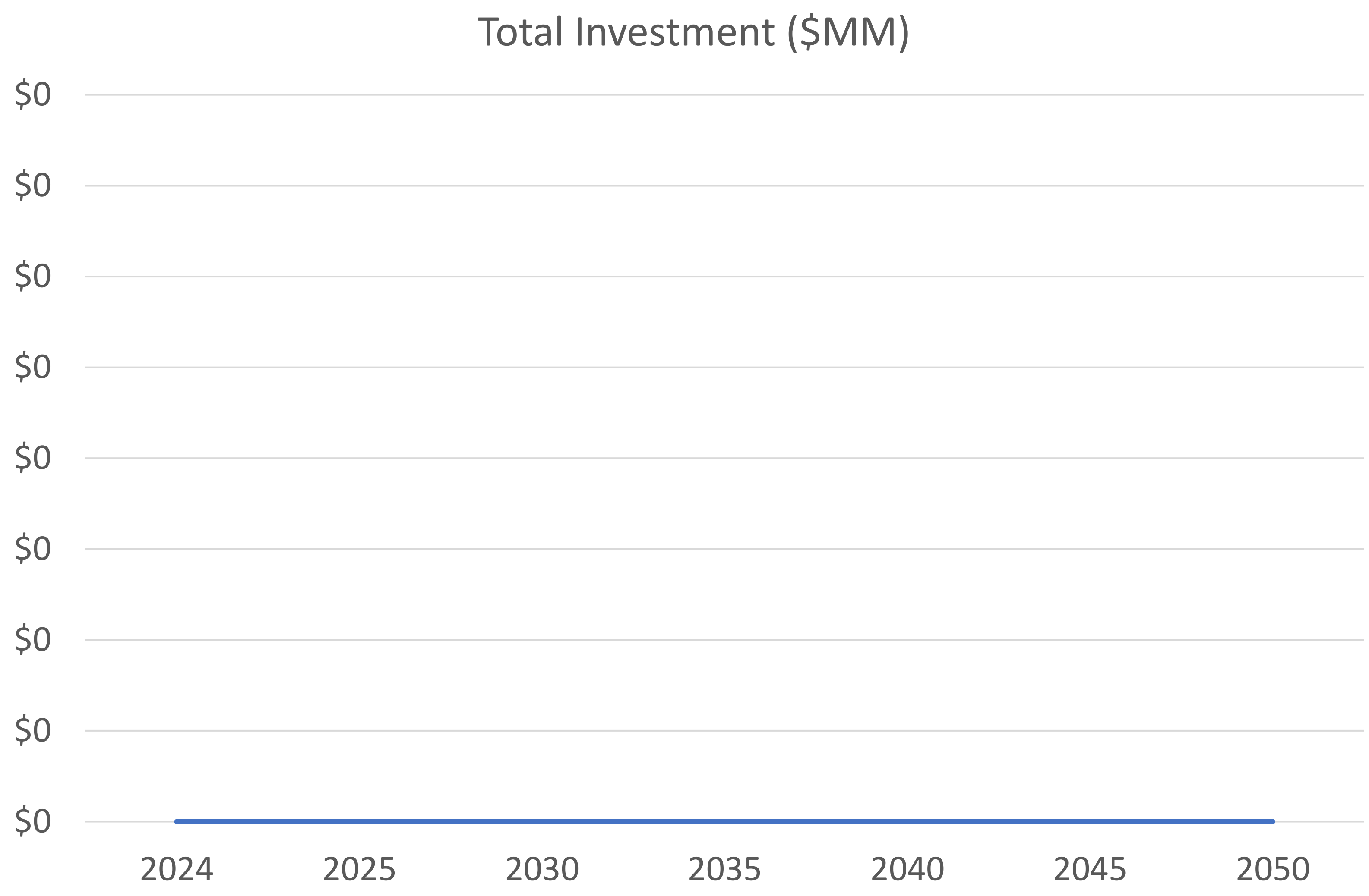


The Gas Generation sub-sector includes existing natural gas plant capacity and newly installed clean gas capacity (including biogas and hydrogen gas), which causes the increase in total installed capacity from 2030 to 2050. No new natural gas generation is installed in Oregon throughout the study years.

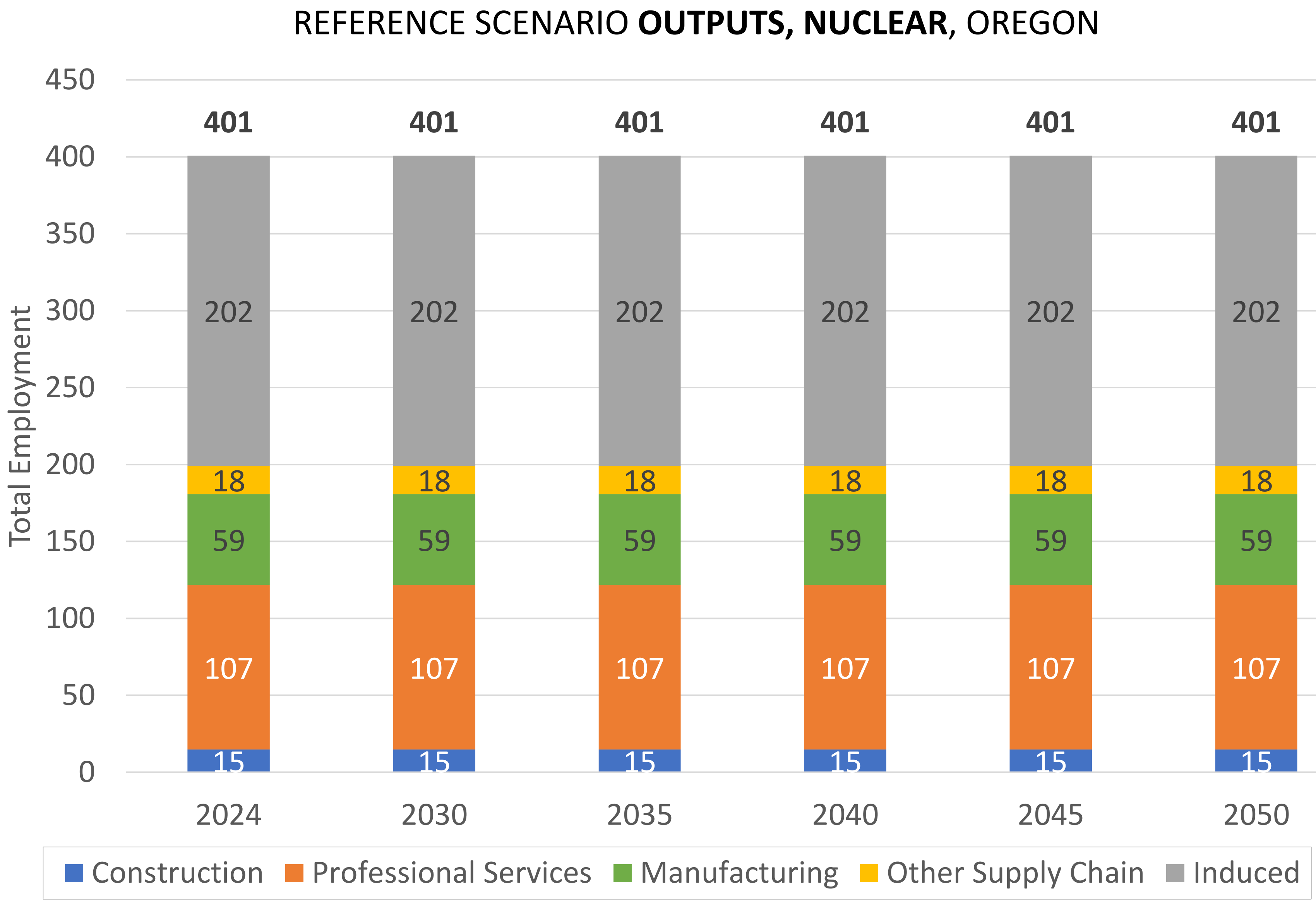
REFERENCE SCENARIO **OUTPUTS, GAS GENERATION**, OREGON



REFERENCE SCENARIO **INPUTS, NUCLEAR**, OREGON

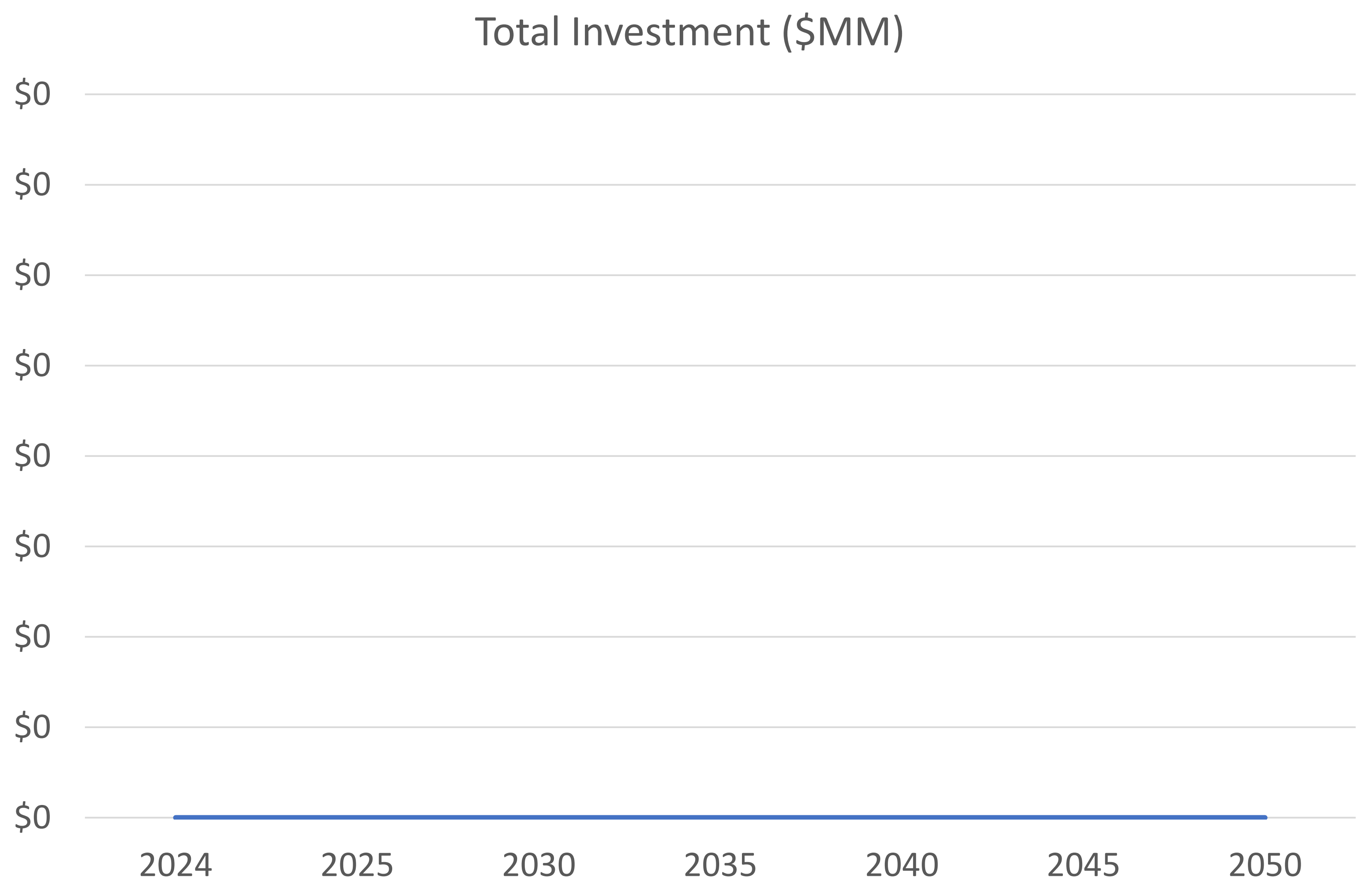


The EER model did not build nuclear generation in Oregon or any other states. Nuclear employment shows support services for existing nuclear generation in other states. These support services are assumed to stay the same throughout the study years.



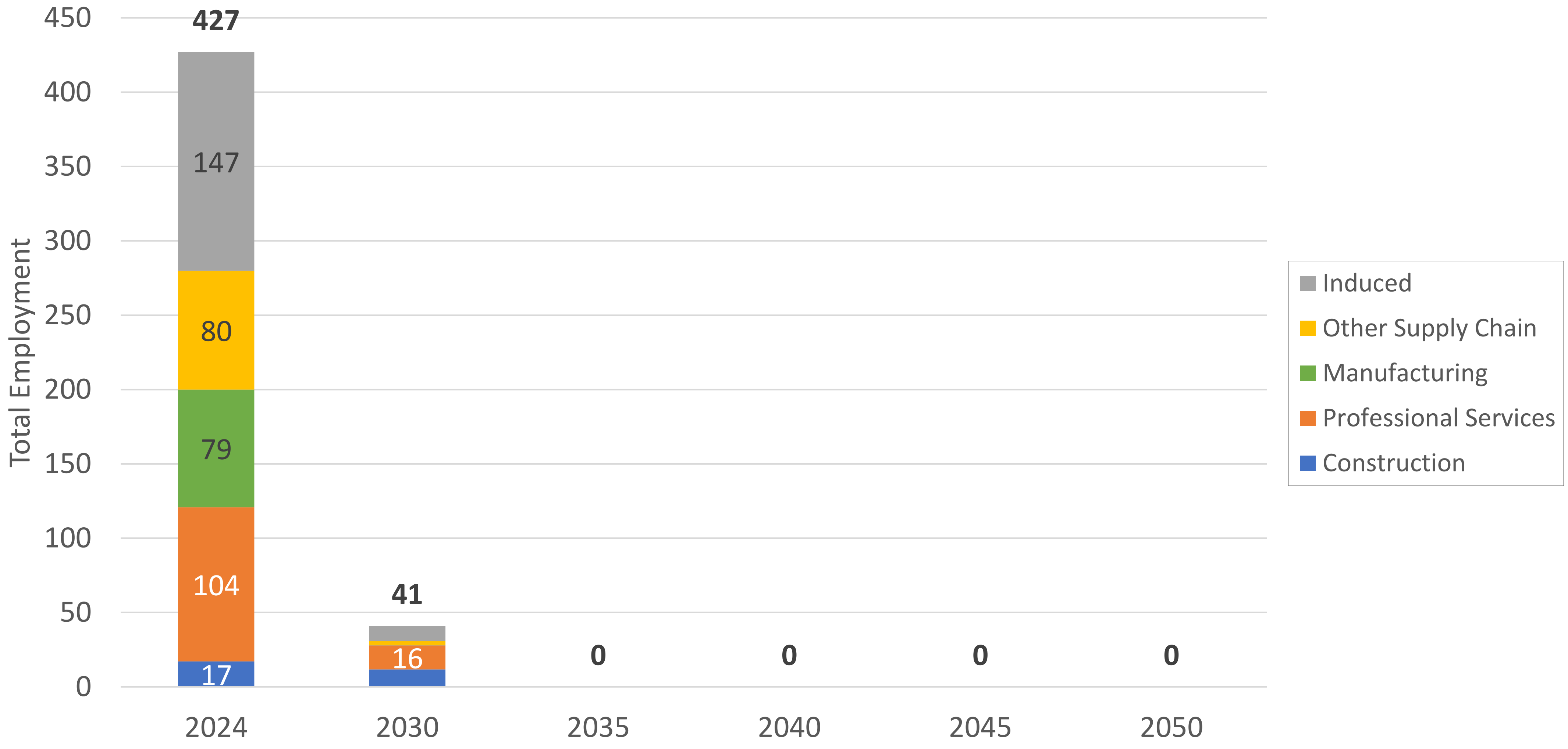
The EER model did not build nuclear generation in Oregon or any other states. Nuclear employment shows support services for existing nuclear generation in other states. These support services are assumed to stay the same throughout the study years.

REFERENCE SCENARIO **INPUTS, OTHER FOSSIL GENERATION**, OREGON

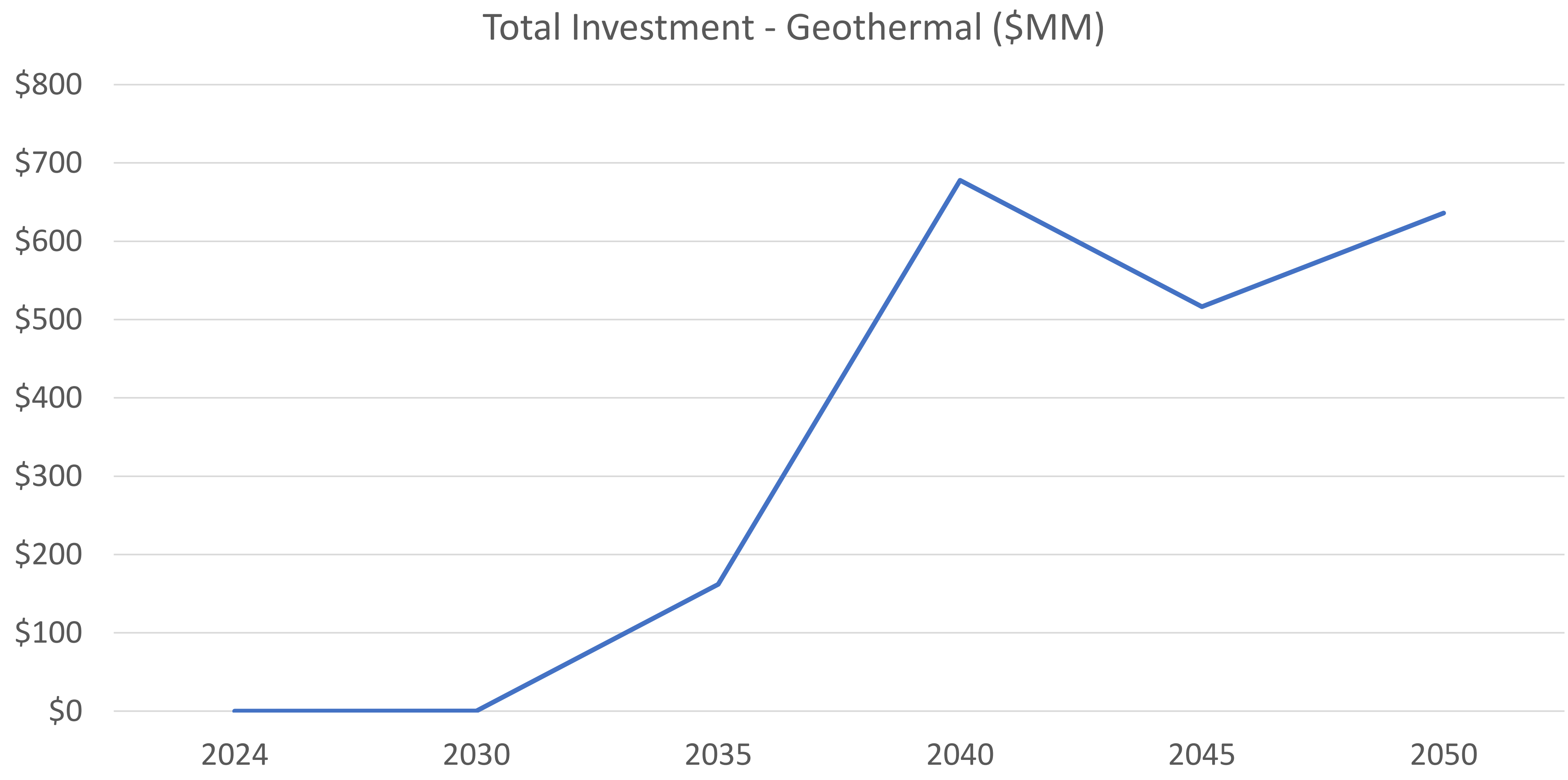


The EER model did not build petroleum or coal generation in Oregon. Other fossil generation employment shows support services for existing coal generation in neighboring states. These support services are assumed to decline with retirements throughout the study years, though there is uncertainty.

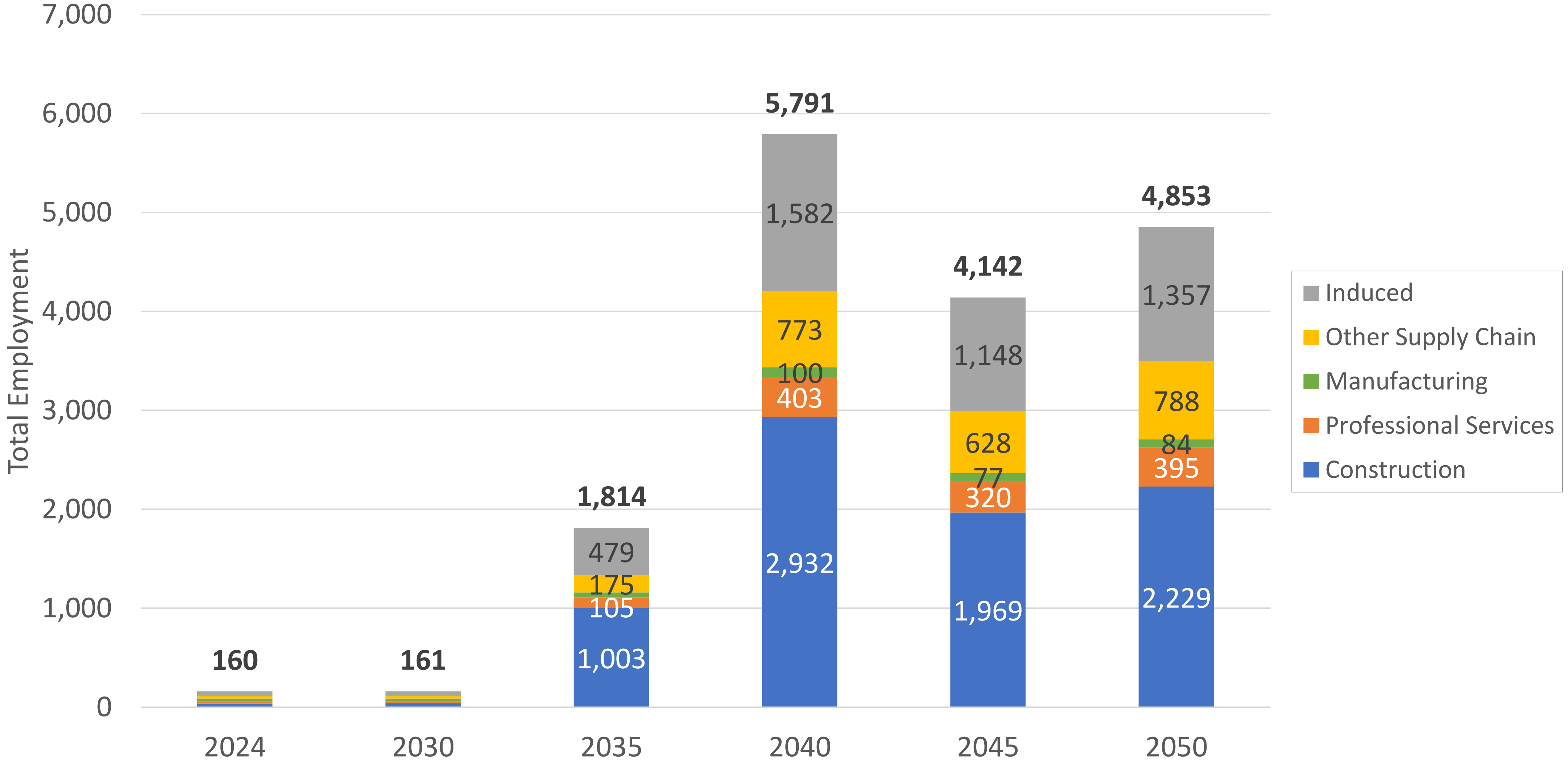
REFERENCE SCENARIO **OUTPUTS, OTHER FOSSIL GENERATION**, OREGON



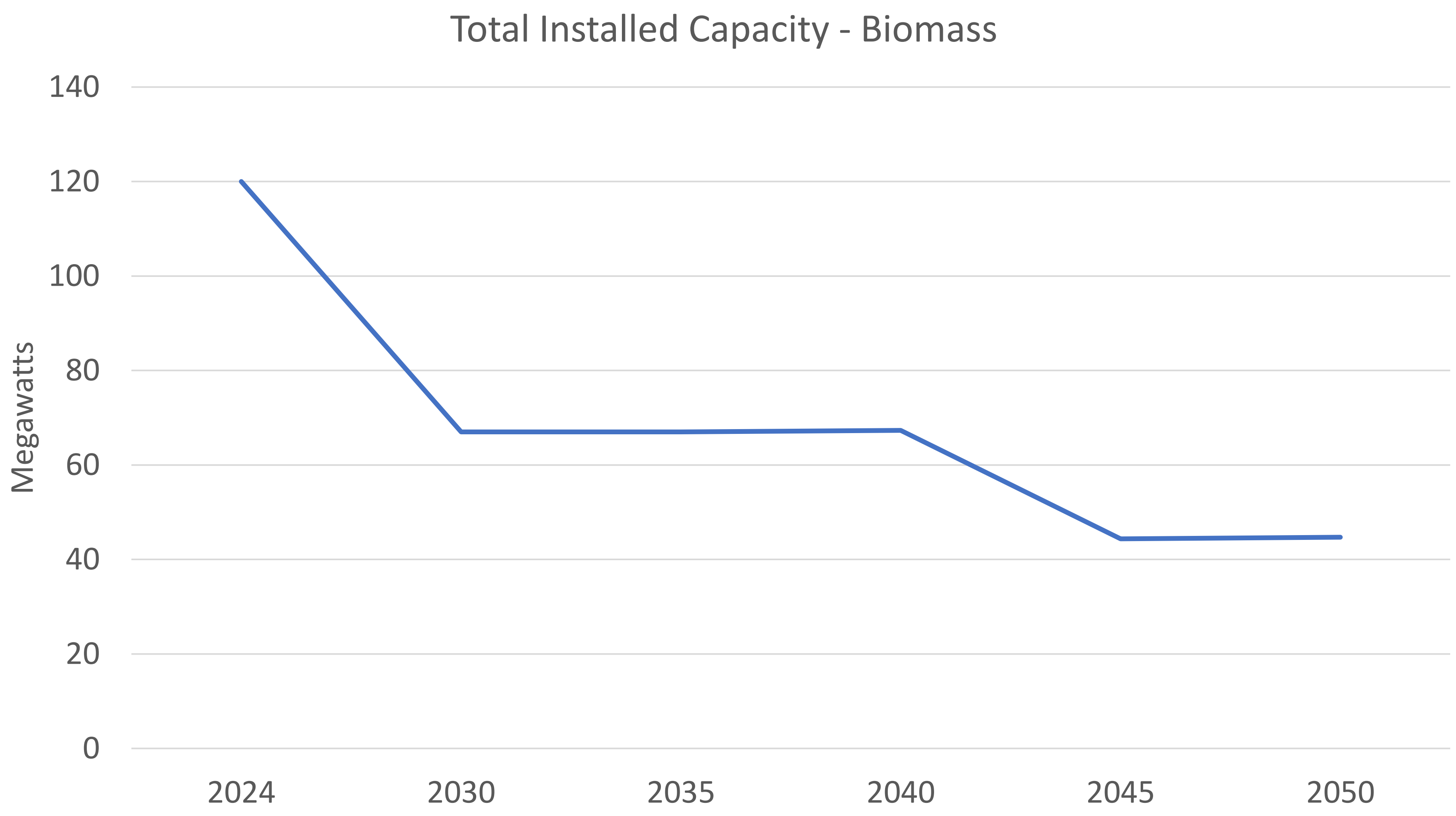
REFERENCE SCENARIO **INPUTS, OTHER RENEWABLE GENERATION - GEOTHERMAL**, OREGON



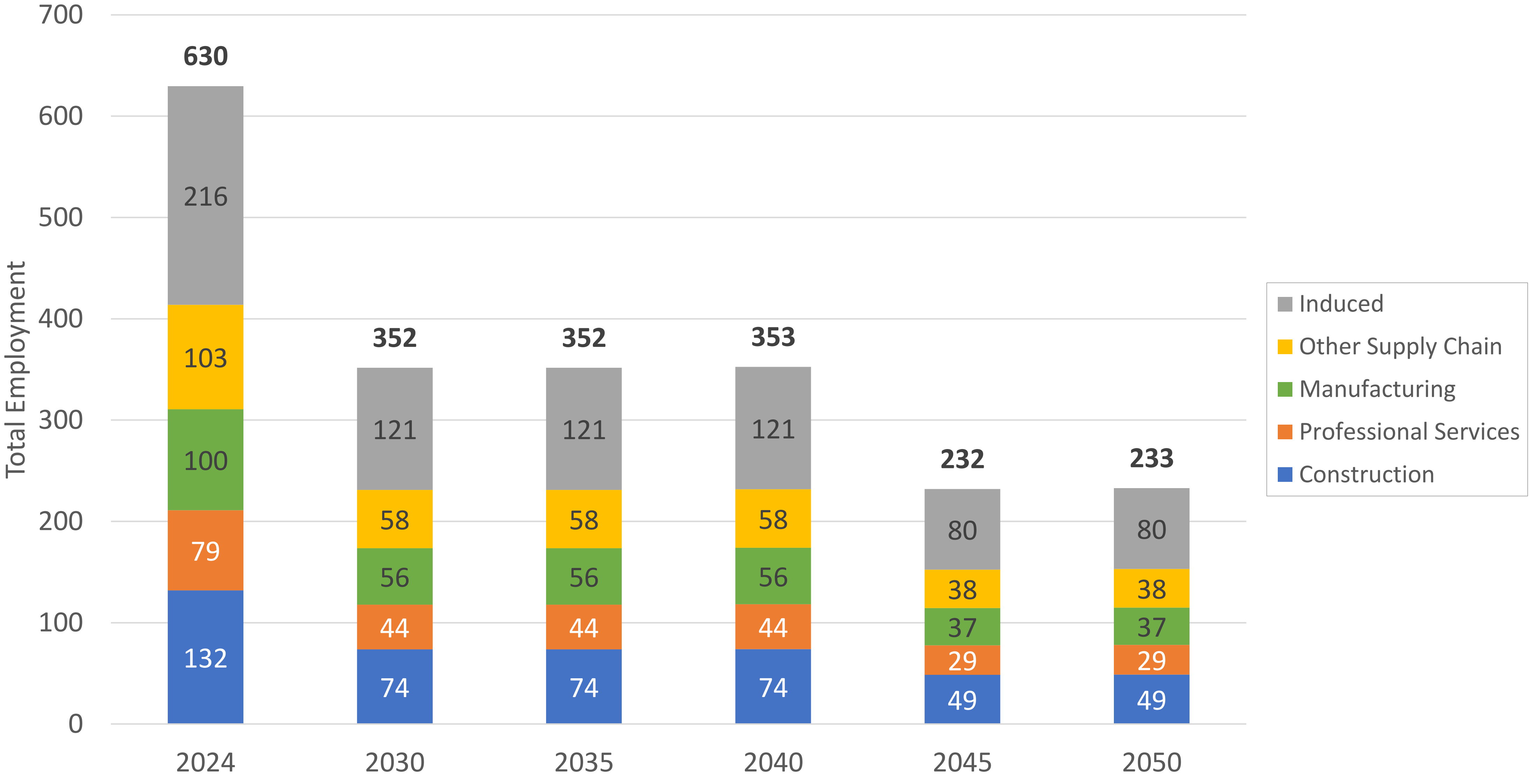
REFERENCE SCENARIO, **OTHER RENEWABLE GENERATION – GEOTHERMAL**, OREGON



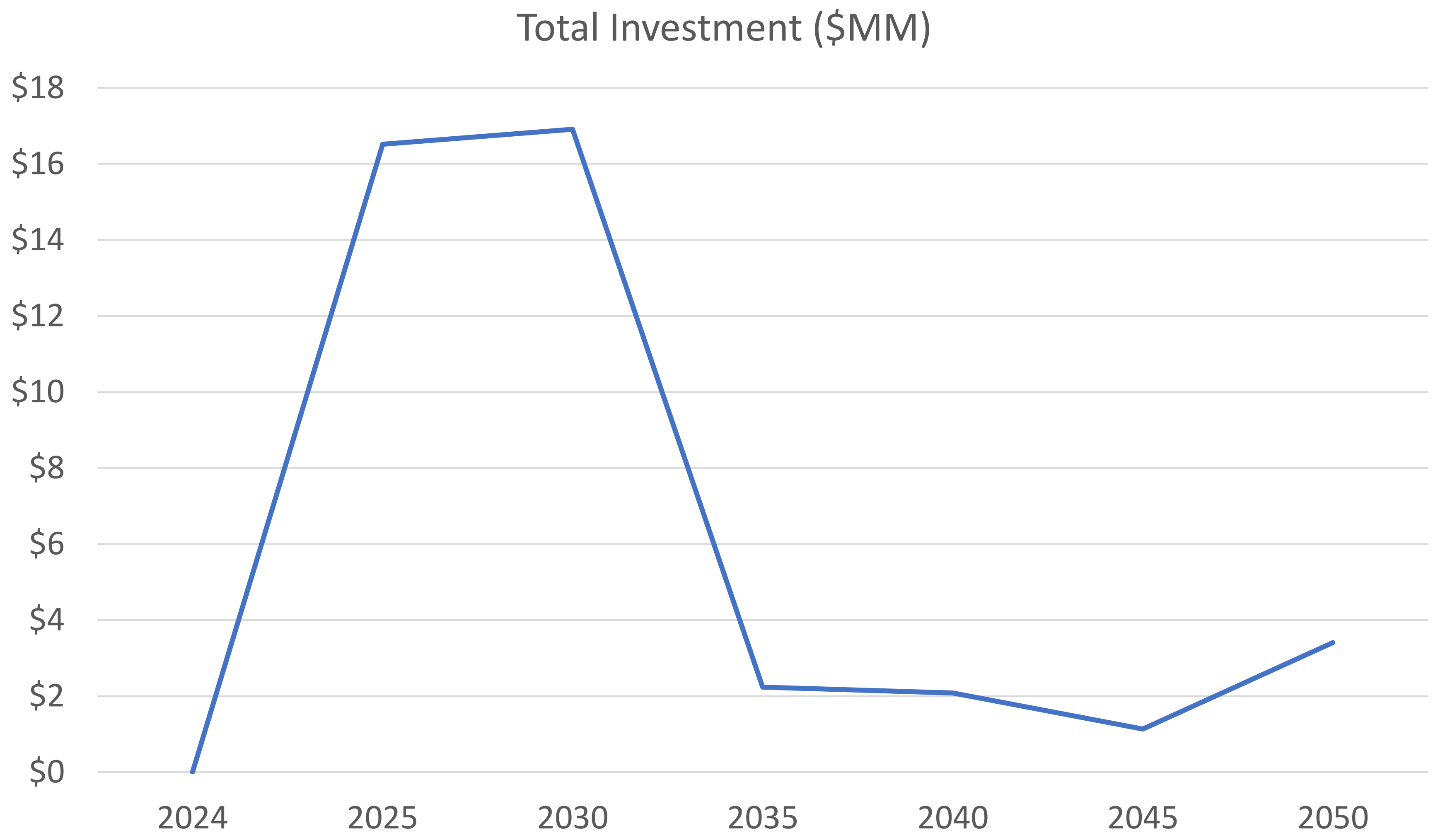
REFERENCE SCENARIO **INPUTS, OTHER RENEWABLE GENERATION - BIOMASS**, OREGON



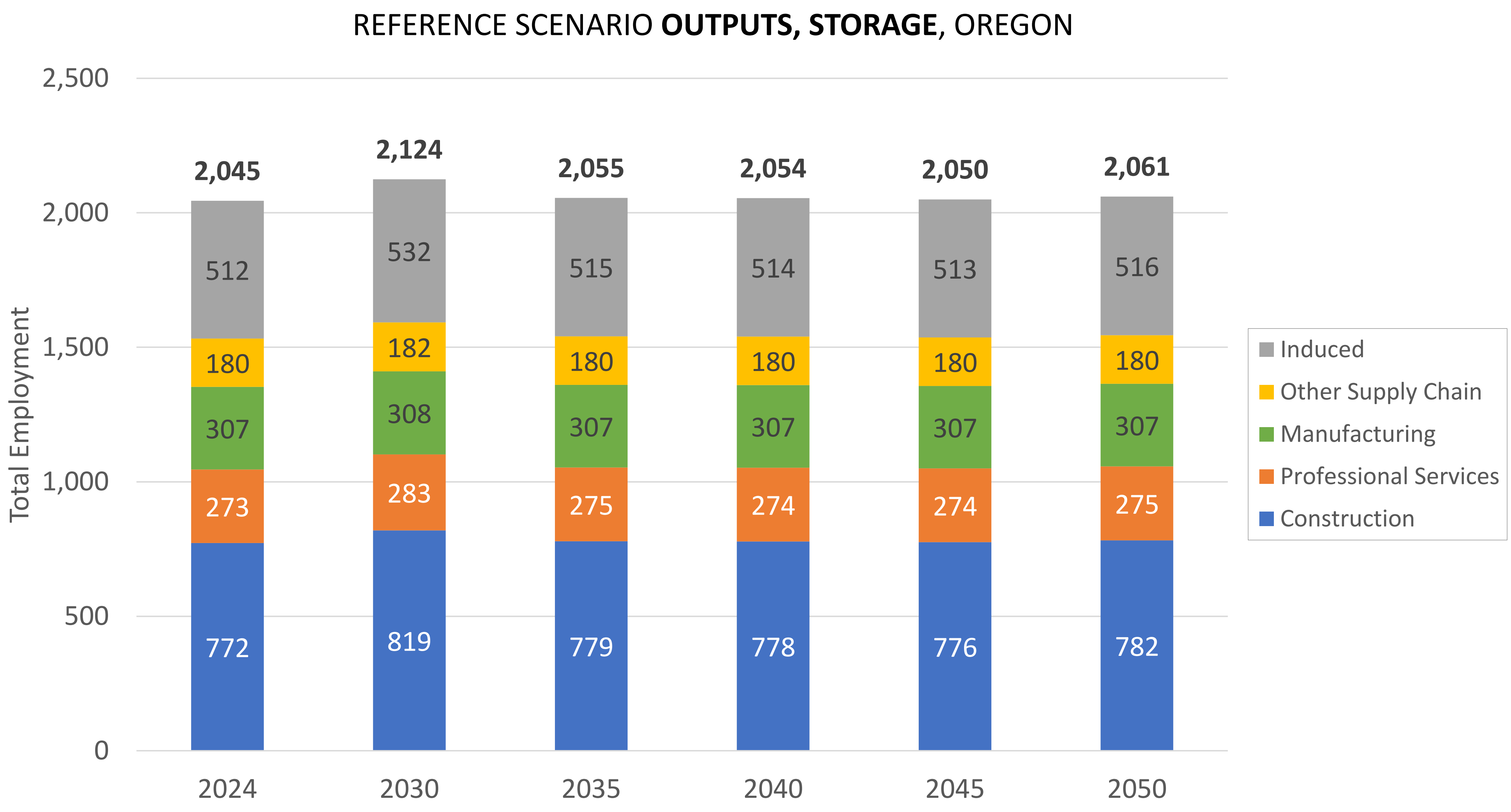
REFERENCE SCENARIO **OUTPUTS, OTHER RENEWABLE GENERATION – BIOMASS**, OREGON



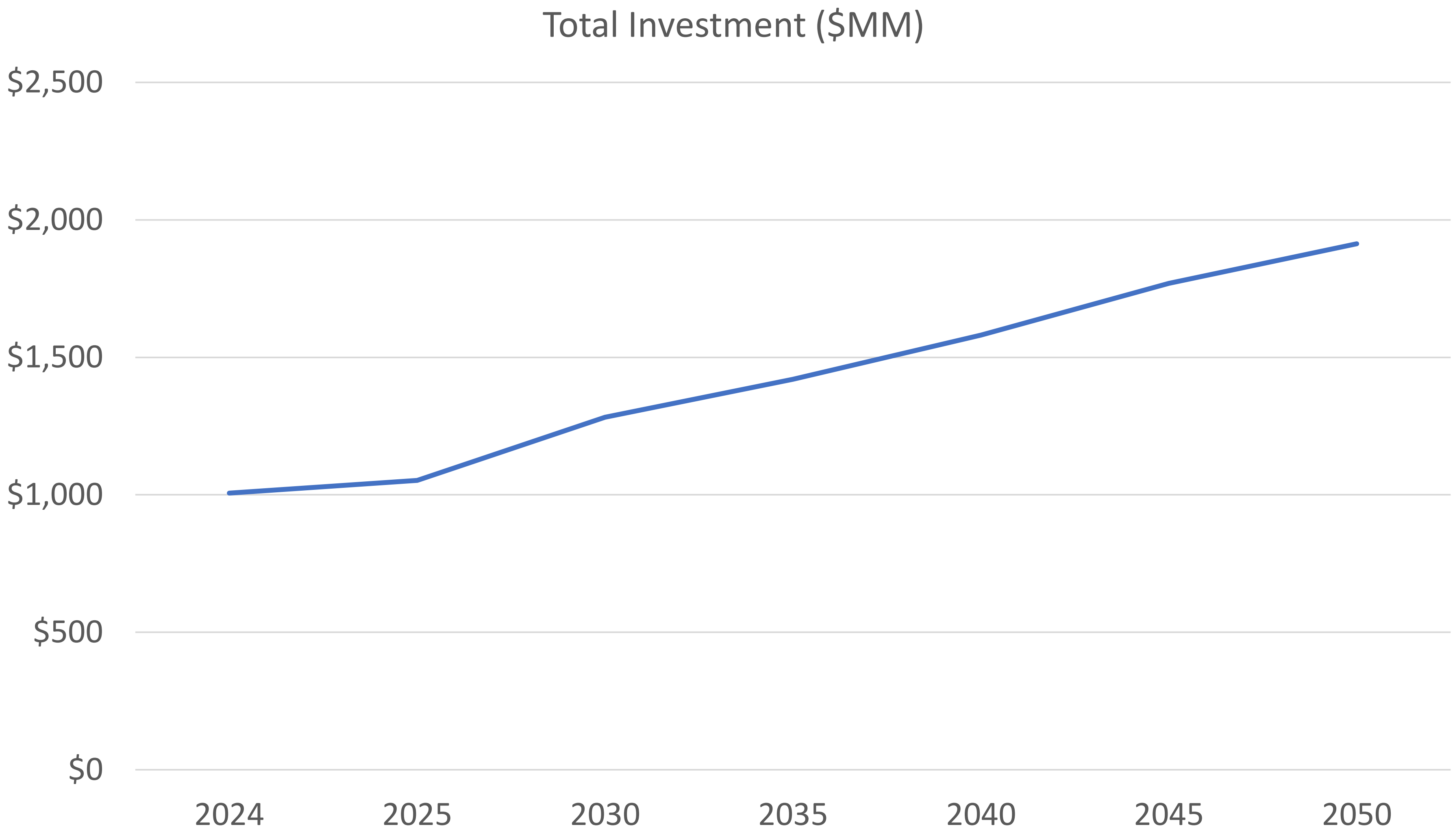
REFERENCE SCENARIO **INPUTS, STORAGE**, OREGON



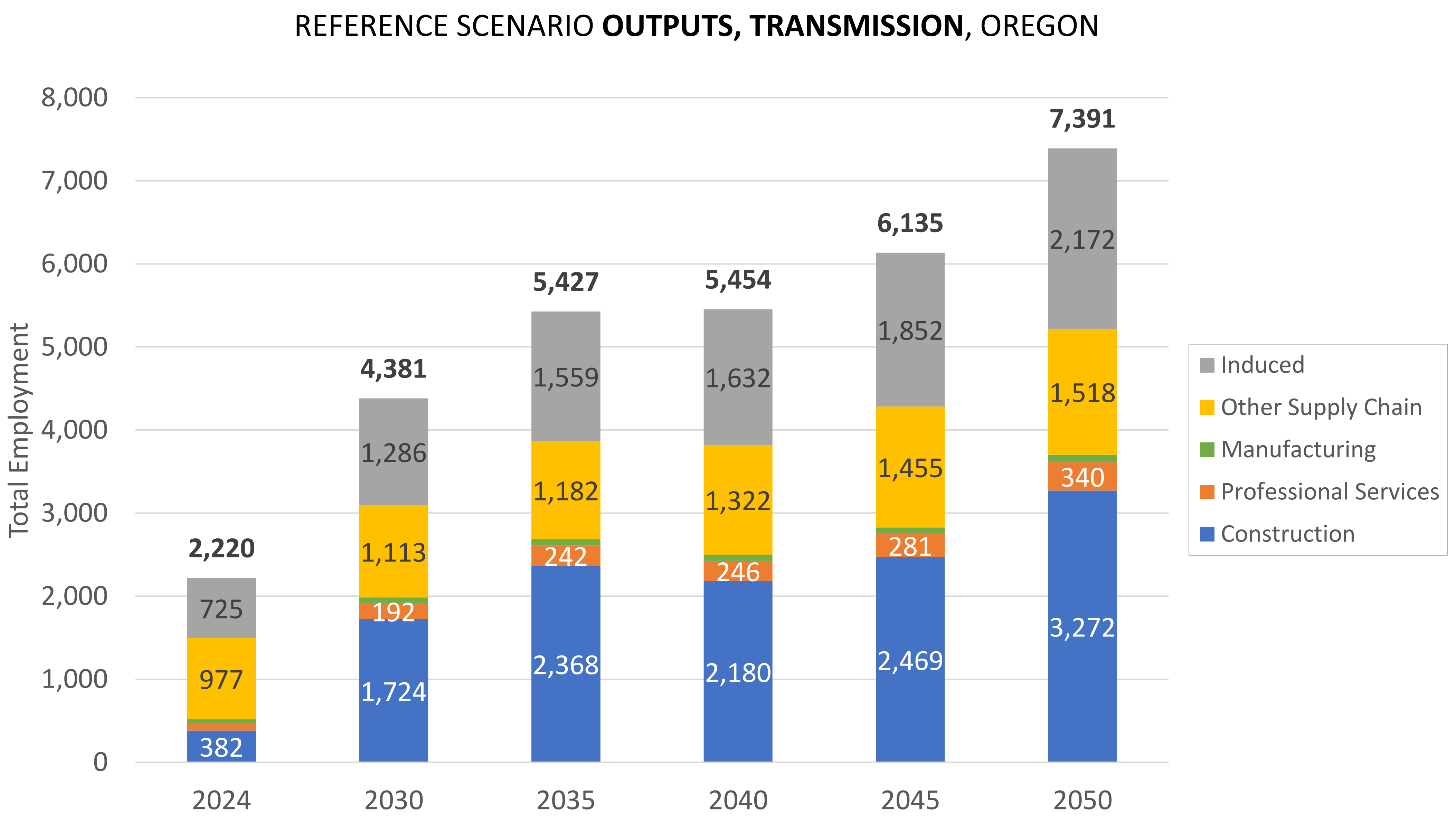
The investment for Storage found by the EER model is incremental to existing Storage capacity. The baseline for 2024 is shown as $0.


REFERENCE SCENARIO **OUTPUTS, STORAGE**, OREGON
Total Employment
2,500
2,000
1,500
1,000
500
0
2,045
2,124
2,055
2,054
2,050
2,061
512
532
515
514
513
516
180
182
180
180
180
180
307
308
307
307
307
307
273
283
275
274
274
275
772
819
779
778
776
782
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

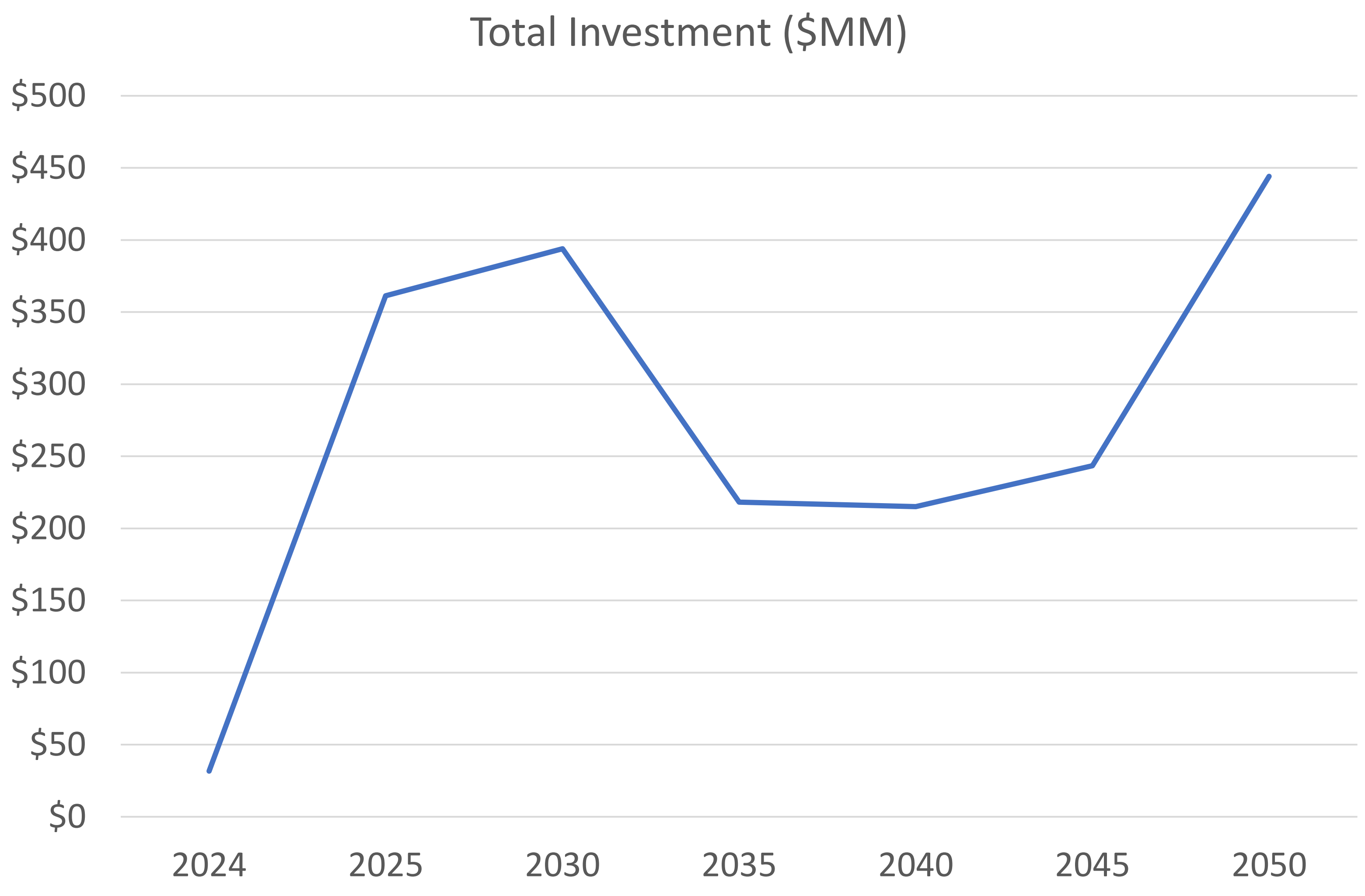
REFERENCE SCENARIO **INPUTS, TRANSMISSION**, OREGON



Investments include both intra- and inter-zonal transmission in Oregon.

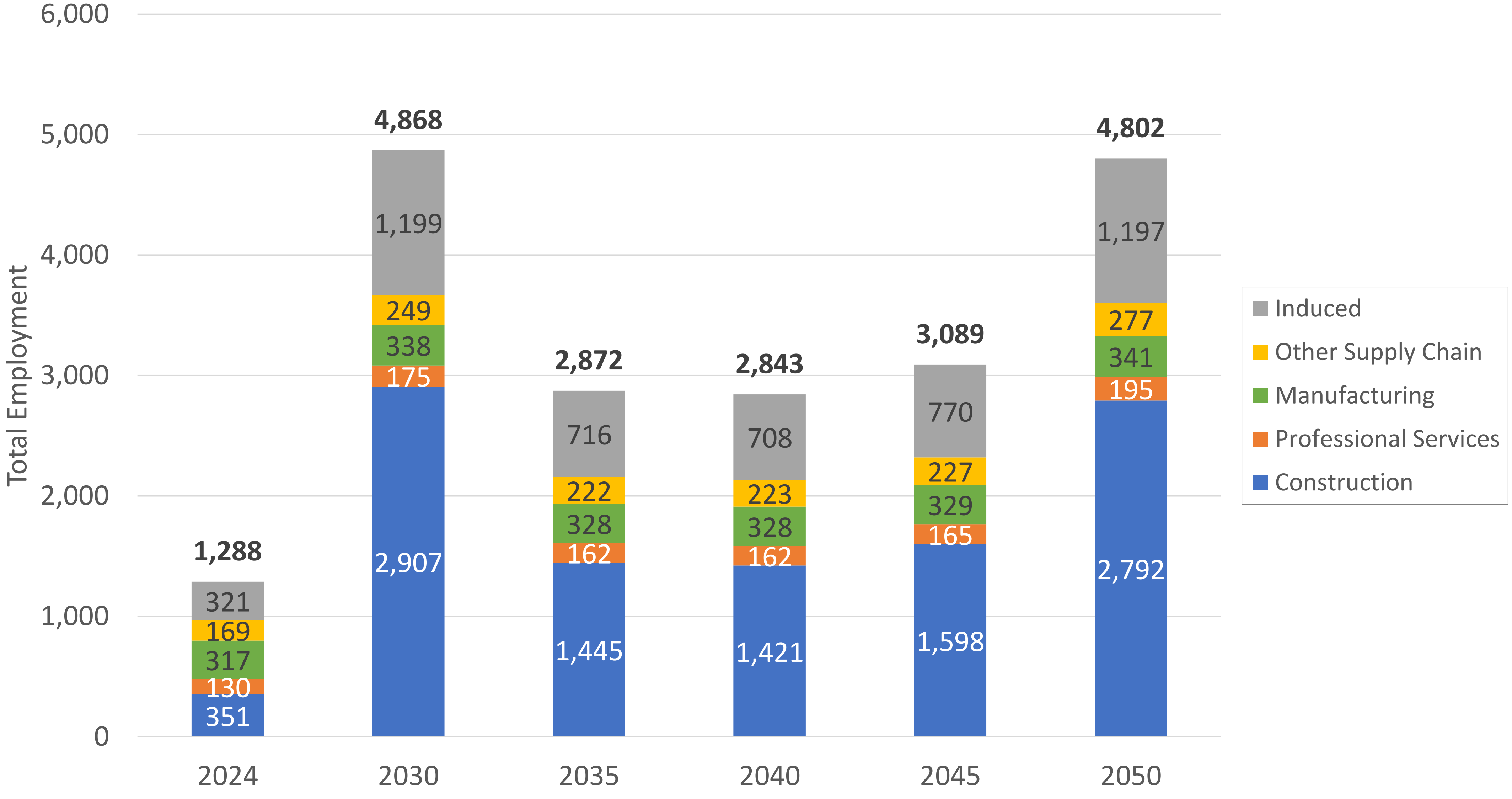

REFERENCE SCENARIO **OUTPUTS, TRANSMISSION**, OREGON
Total Employment
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2024
2030
2035
2040
2045
2050
2,220
4,381
5,427
5,454
6,135
7,391
725
977
382
1,286
1,113
192
1,724
1,559
1,182
242
2,368
1,632
1,322
246
2,180
1,852
1,455
281
2,469
2,172
1,518
340
3,272
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, UTILITY SOLAR**, OREGON



Significant capital investments required to economically build out utility-scale solar electric generating capacity to meet load.

REFERENCE SCENARIO **OUTPUTS, UTILITY SOLAR**, OREGON

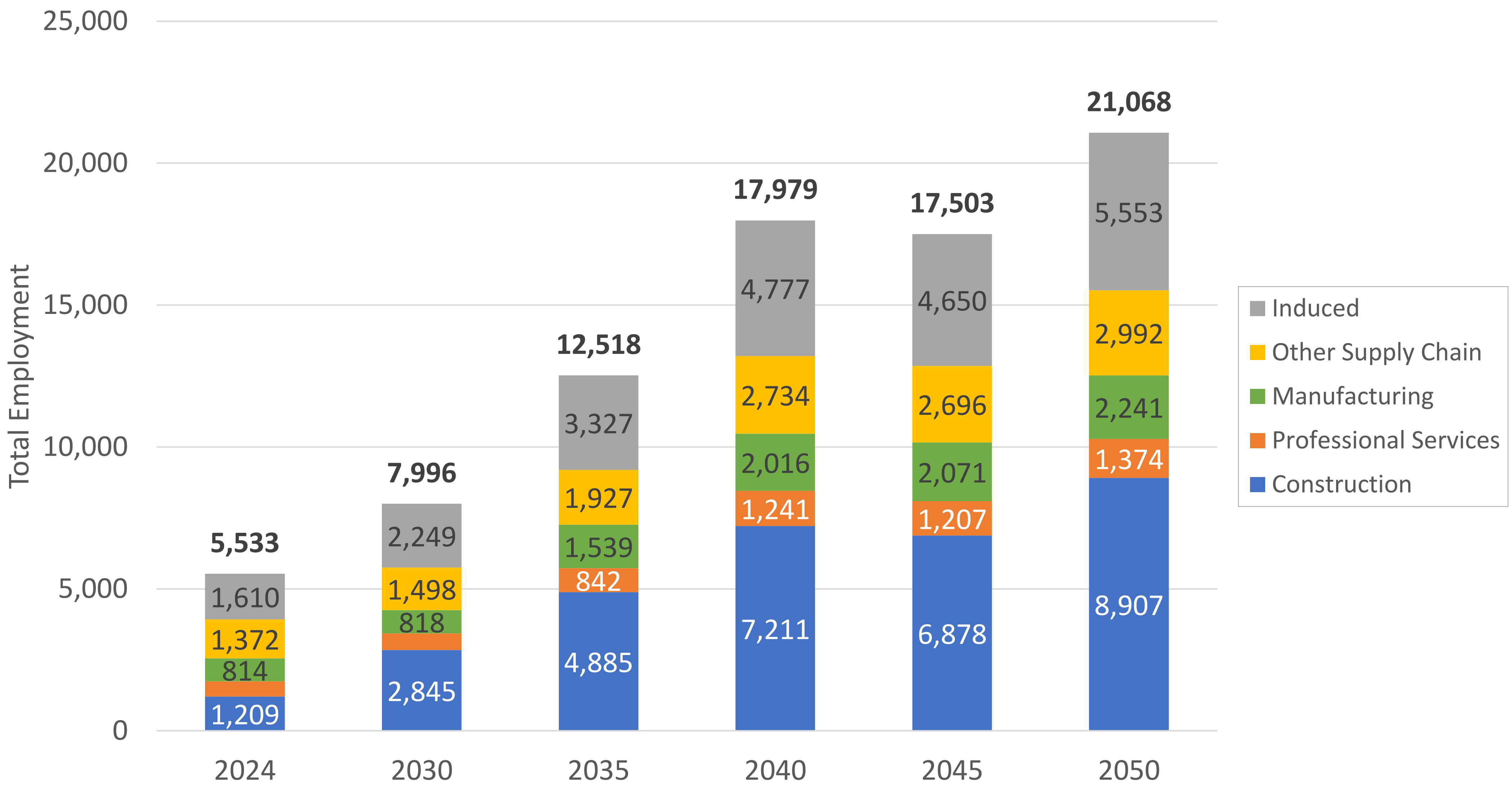


ELECTRICITY: REFERENCE, EAST OREGON*

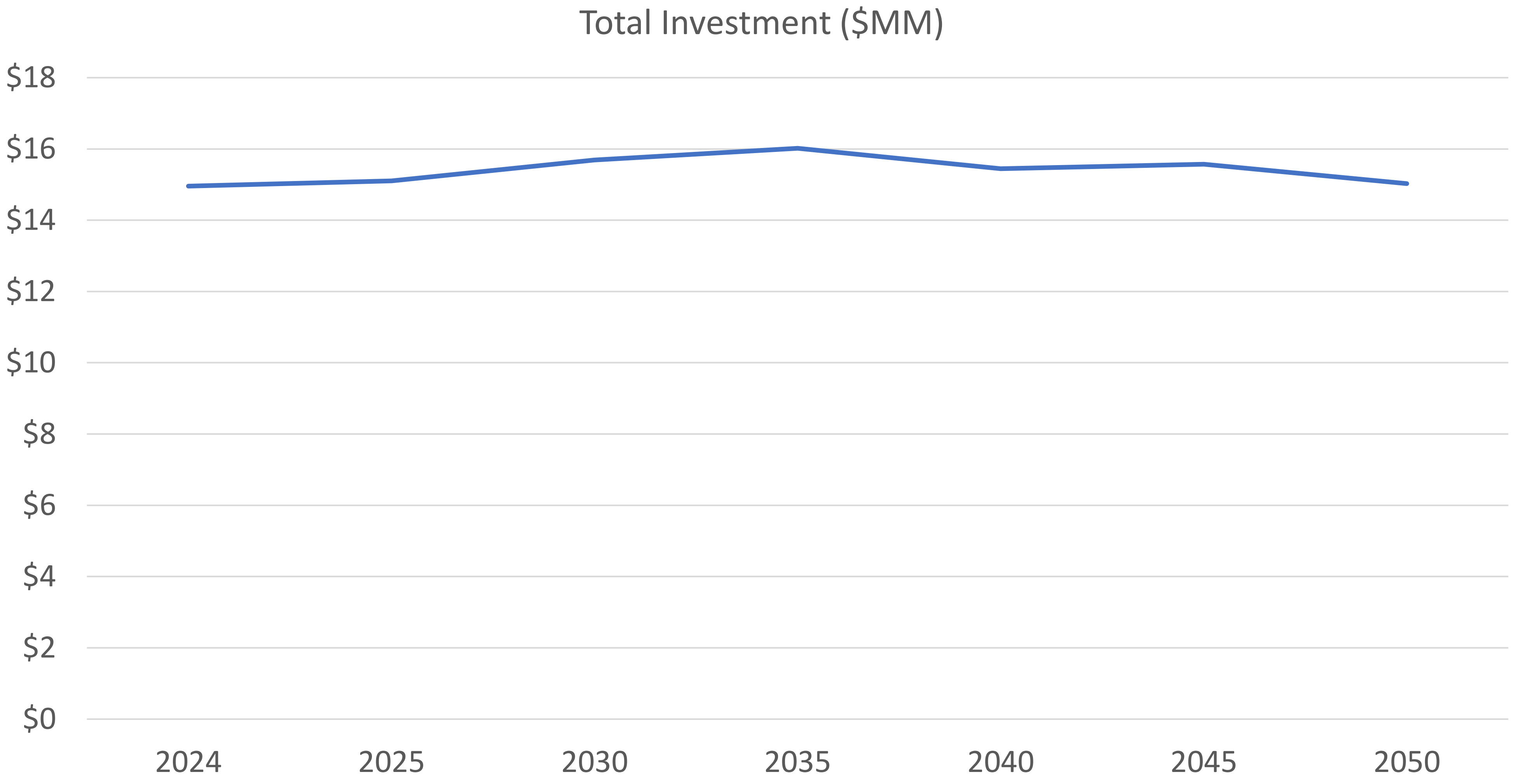
SUB-SECTOR		YEAR					
		2024	2030	2035	2040	2045	2050
Growing Sub-Sectors							
Distribution		1,769	2,115	2,235	2,382	2,518	2,600
Hydropower		501	502	620	518	517	517
Land-Based Wind		496	476	2,705	4,212	4,553	5,184
Gas Generation		492	492	501	520	517	523
Nuclear		53	53	53	53	53	53
Other Ren. Gen.	**Geothermal**	160	161	1,814	5,791	4,142	4,853
	Biomass	0	0	0	0	0	0
Storage		161	162	166	165	162	167
Transmission		140	1,111	1,518	1,528	1,772	2,252
Utility Solar		279	1,469	1,431	1,398	1,862	3,575
Distributed Solar		1,400	1,455	1,476	1,411	1,407	1,344
Sub-total		**5,451**	**7,996**	**12,518**	**17,979**	**17,503**	**21,068**
Change			**2,545**	**7,067**	**12,528**	**12,052**	**15,617**
Displacement Sub-Sectors							
Other Fossil Generation		82	0	0	0	0	0
Sub-total		**82**	**0**	**0**	**0**	**0**	**0**
Change			**-82**	**-82**	**-82**	**-82**	**-82**
Electricity OVERALL		**5,533**	**7,996**	**12,518**	**17,979**	**17,503**	**21,068**
Net Change from 2024			**2,463**	**6,985**	**12,446**	**11,970**	**15,535**

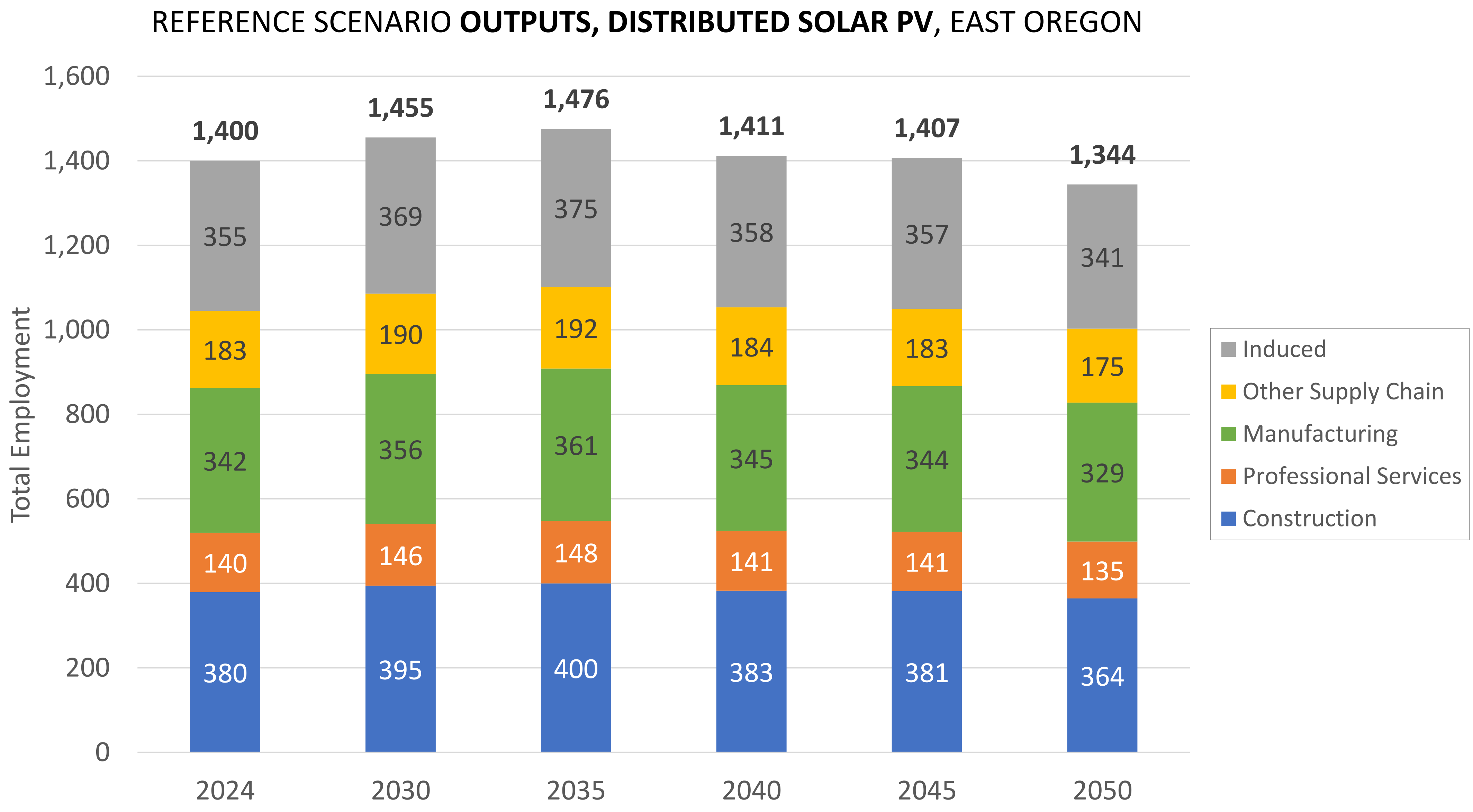
**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

REFERENCE SCENARIO, **ELECTRICITY – TOTALS**, EAST OREGON

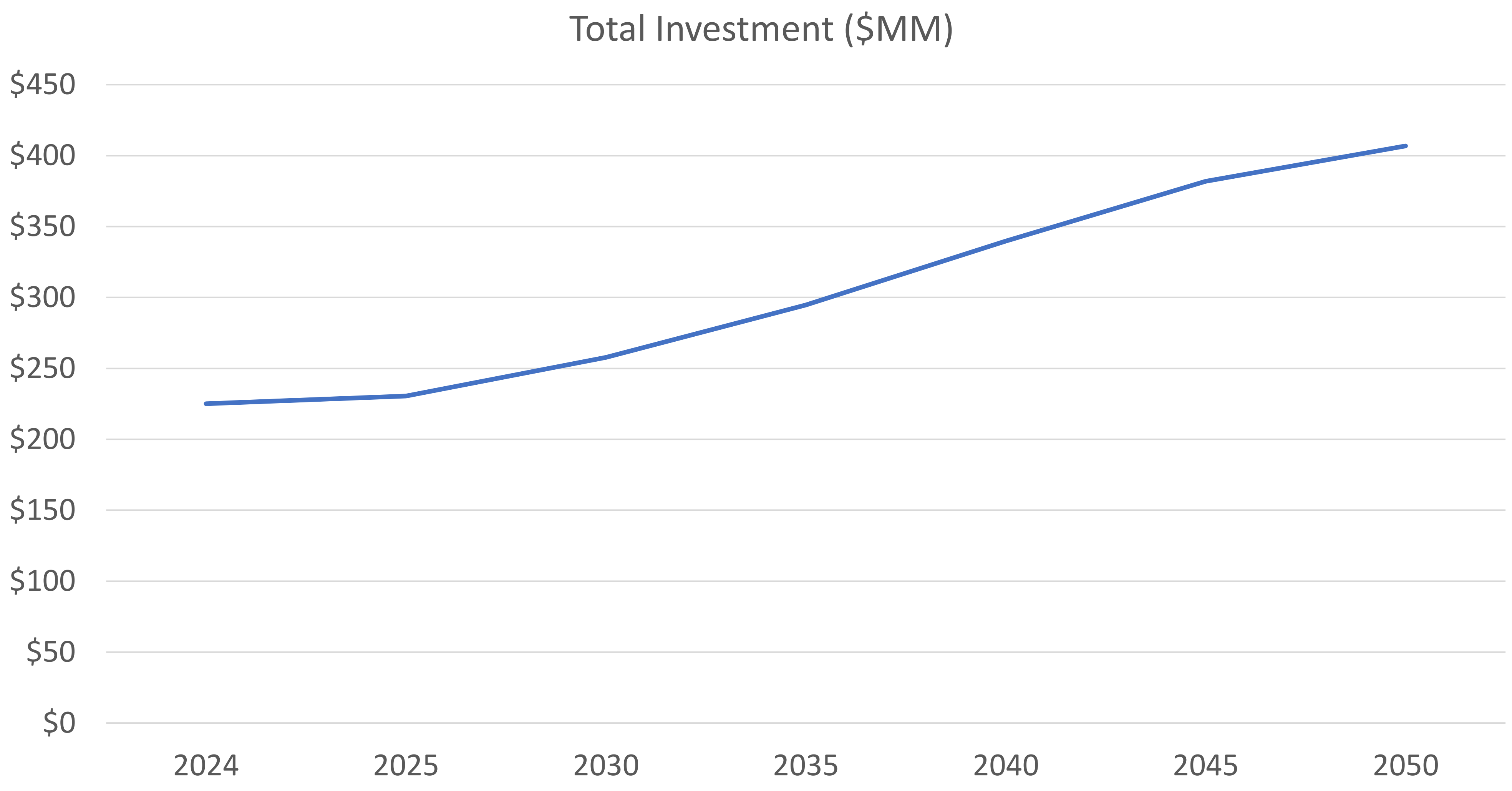


REFERENCE SCENARIO **INPUTS, DISTRIBUTED SOLAR PV**, EAST OREGON

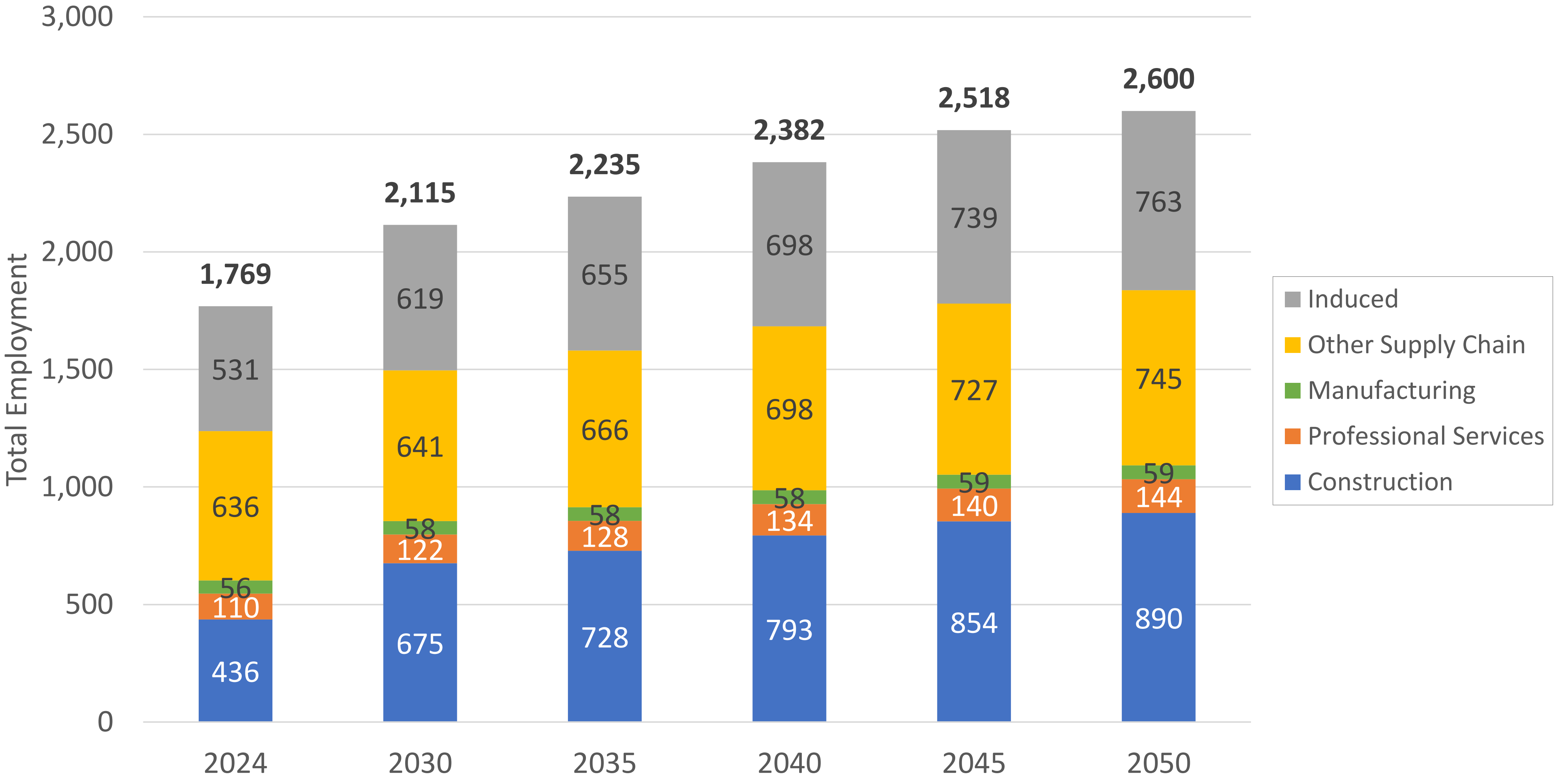



REFERENCE SCENARIO **OUTPUTS, DISTRIBUTED SOLAR PV**, EAST OREGON
Total Employment
1,600
1,400
1,200
1,000
800
600
400
200
0
2024
2030
2035
2040
2045
2050
1,400
1,455
1,476
1,411
1,407
1,344
355
369
375
358
357
341
183
190
192
184
183
175
342
356
361
345
344
329
140
146
148
141
141
135
380
395
400
383
381
364
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

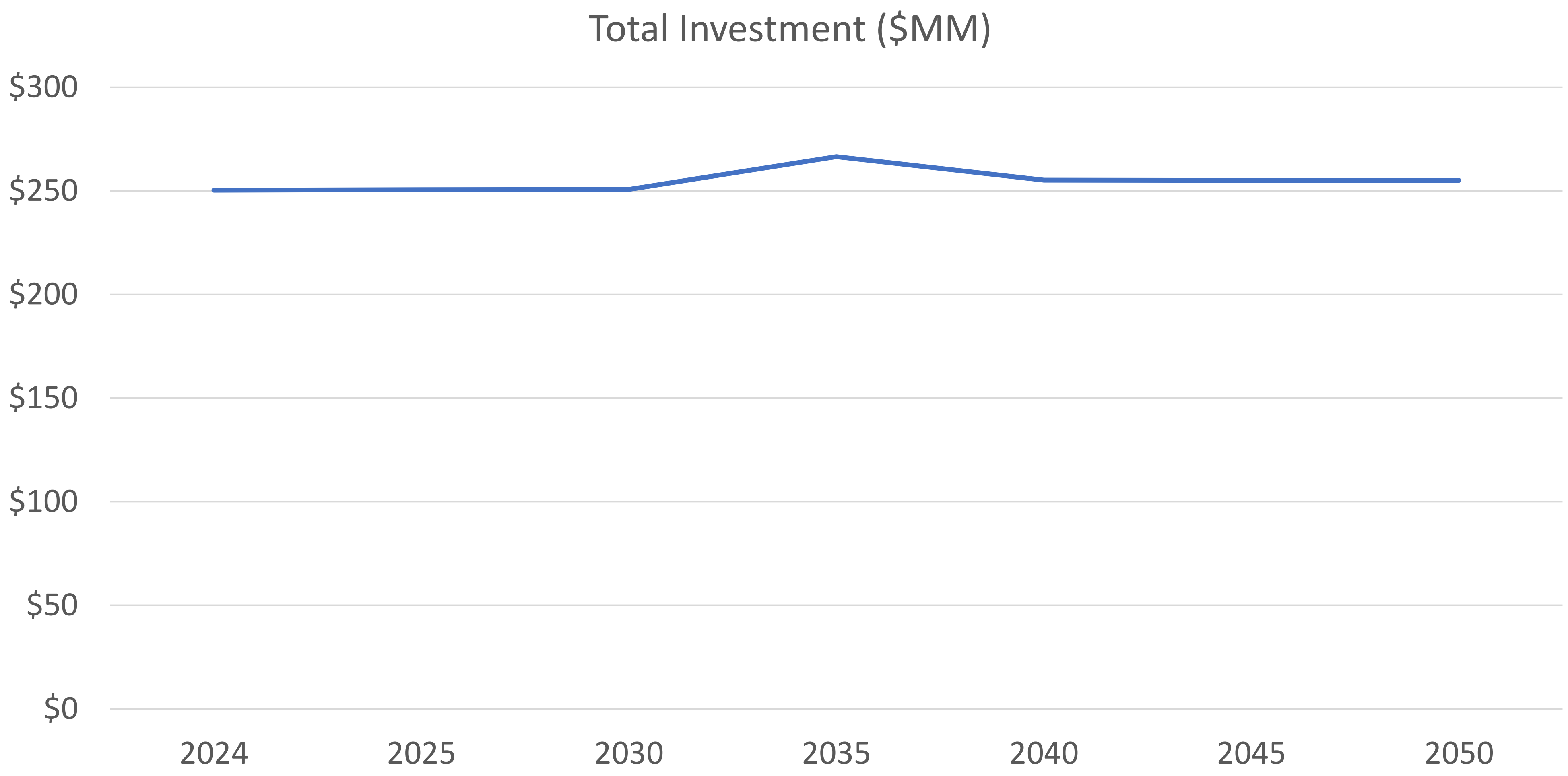
REFERENCE SCENARIO **INPUTS, DISTRIBUTION**, EAST OREGON

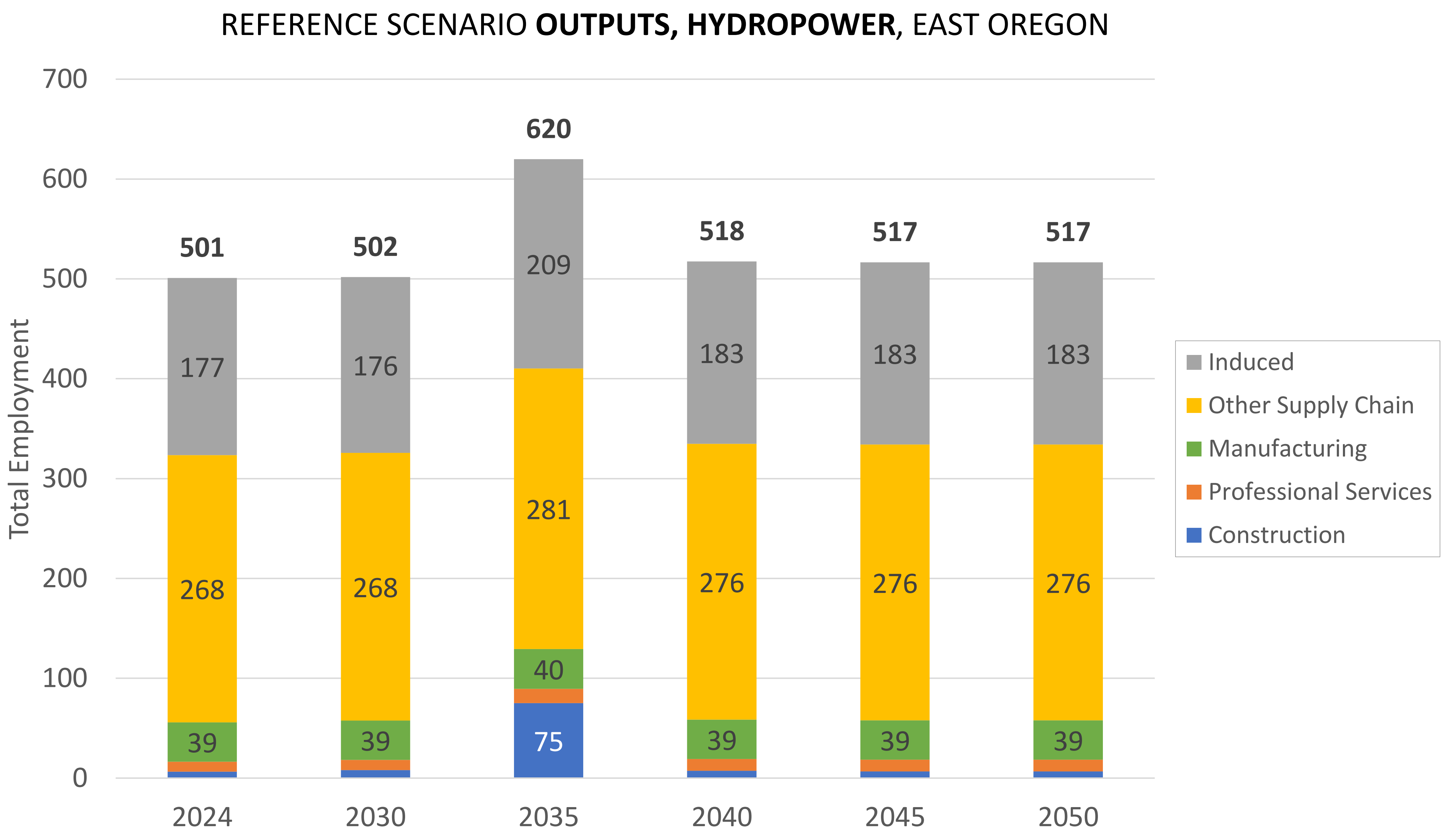


REFERENCE SCENARIO **OUTPUTS, DISTRIBUTION**, EAST OREGON

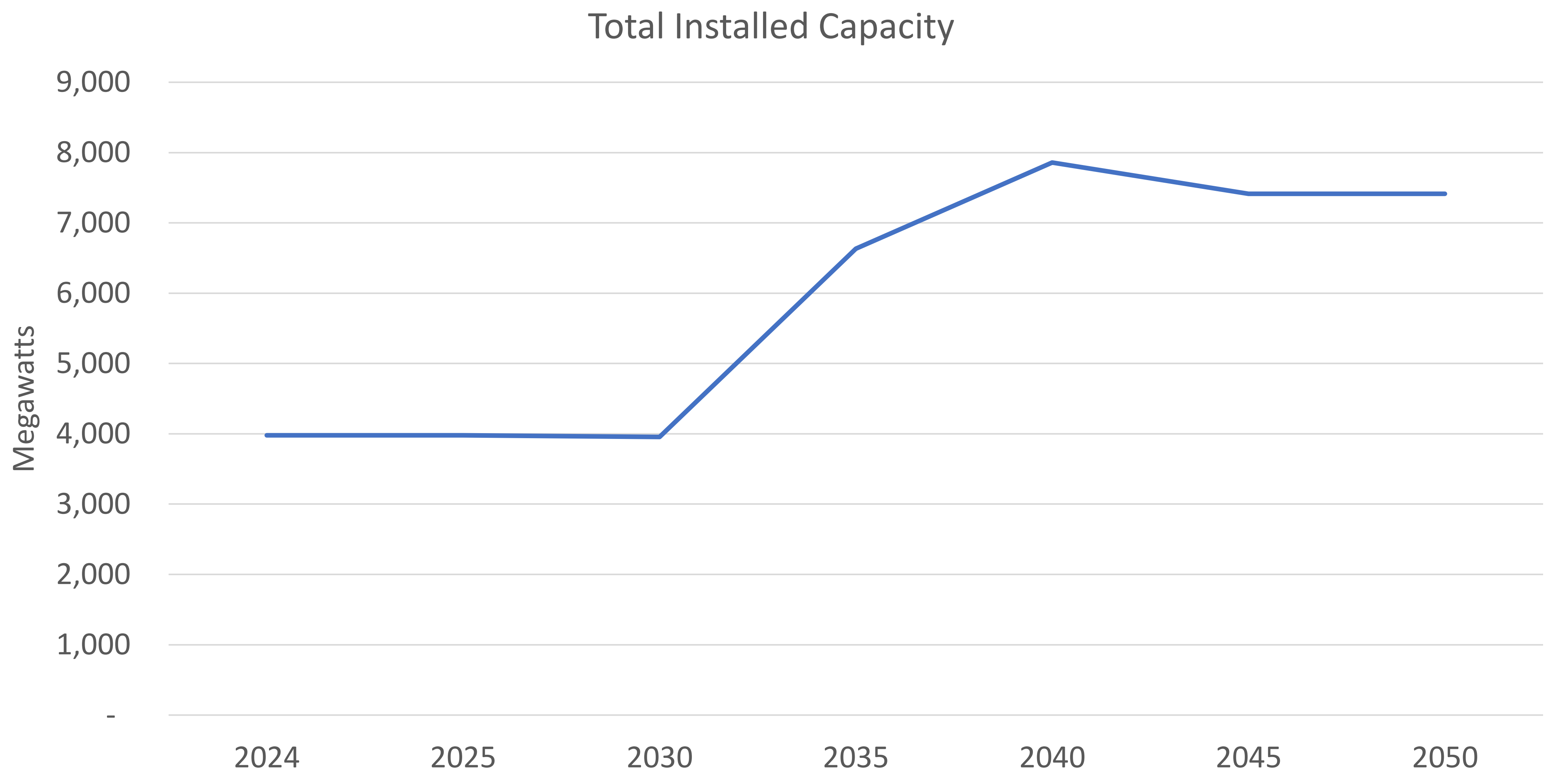


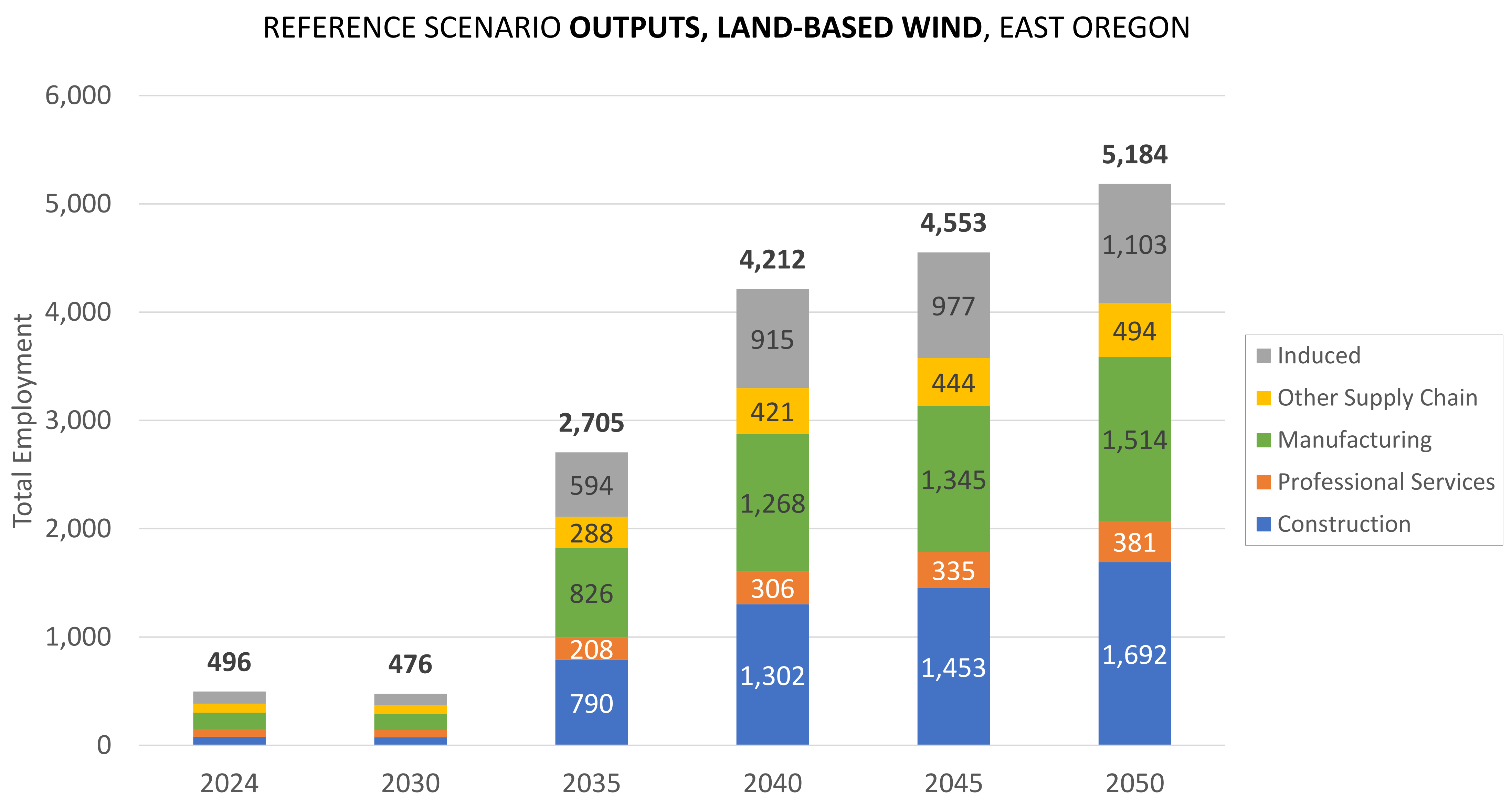
REFERENCE SCENARIO **INPUTS, HYROPOWER**, EAST OREGON



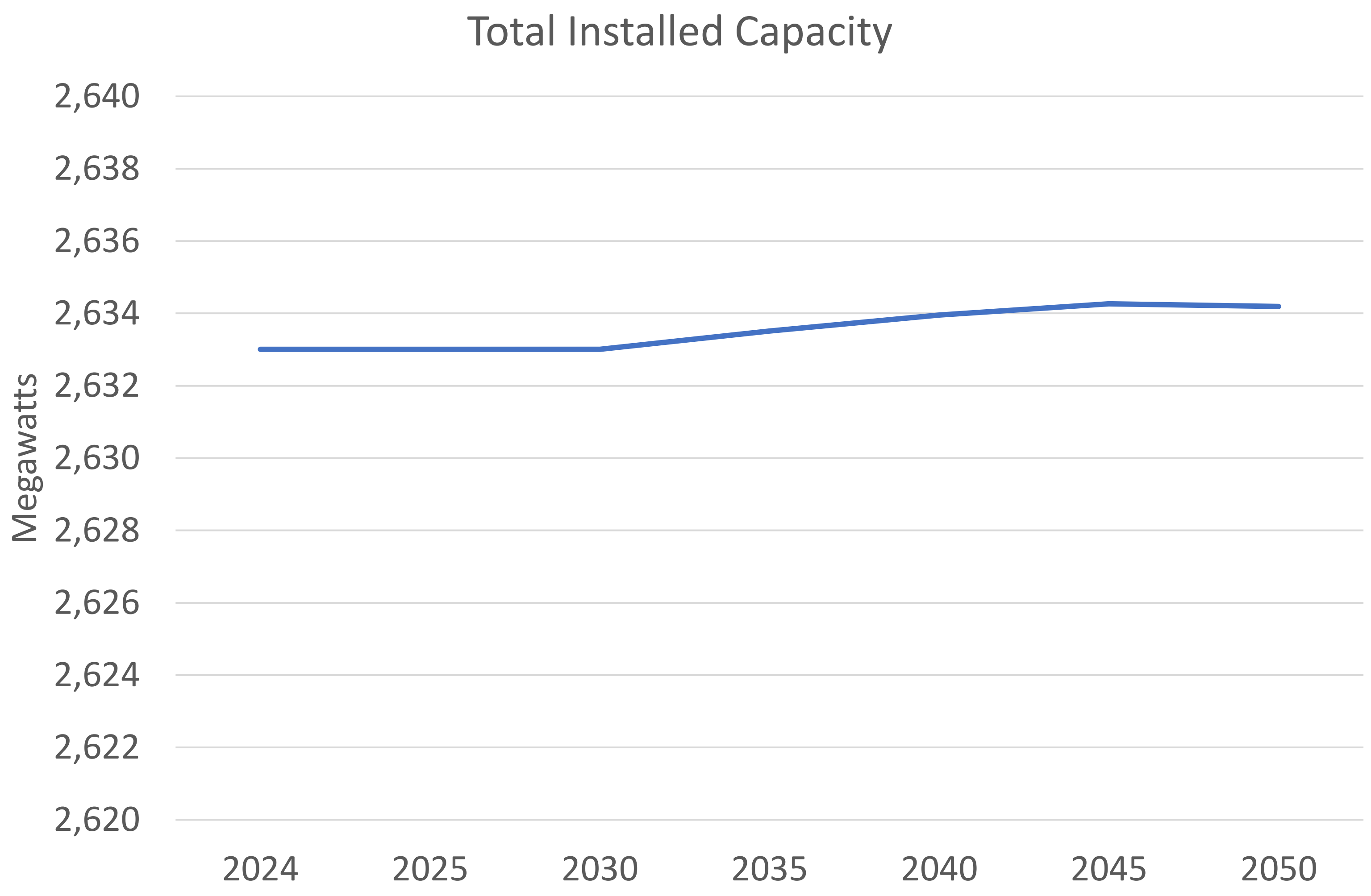

REFERENCE SCENARIO OUTPUTS, HYDROPOWER, EAST OREGON
Total Employment
700
600
500
400
300
200
100
0
501
502
620
518
517
517
177
176
209
183
183
183
268
268
281
276
276
276
39
39
40
39
39
39
75
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, LAND-BASED WIND**, EAST OREGON

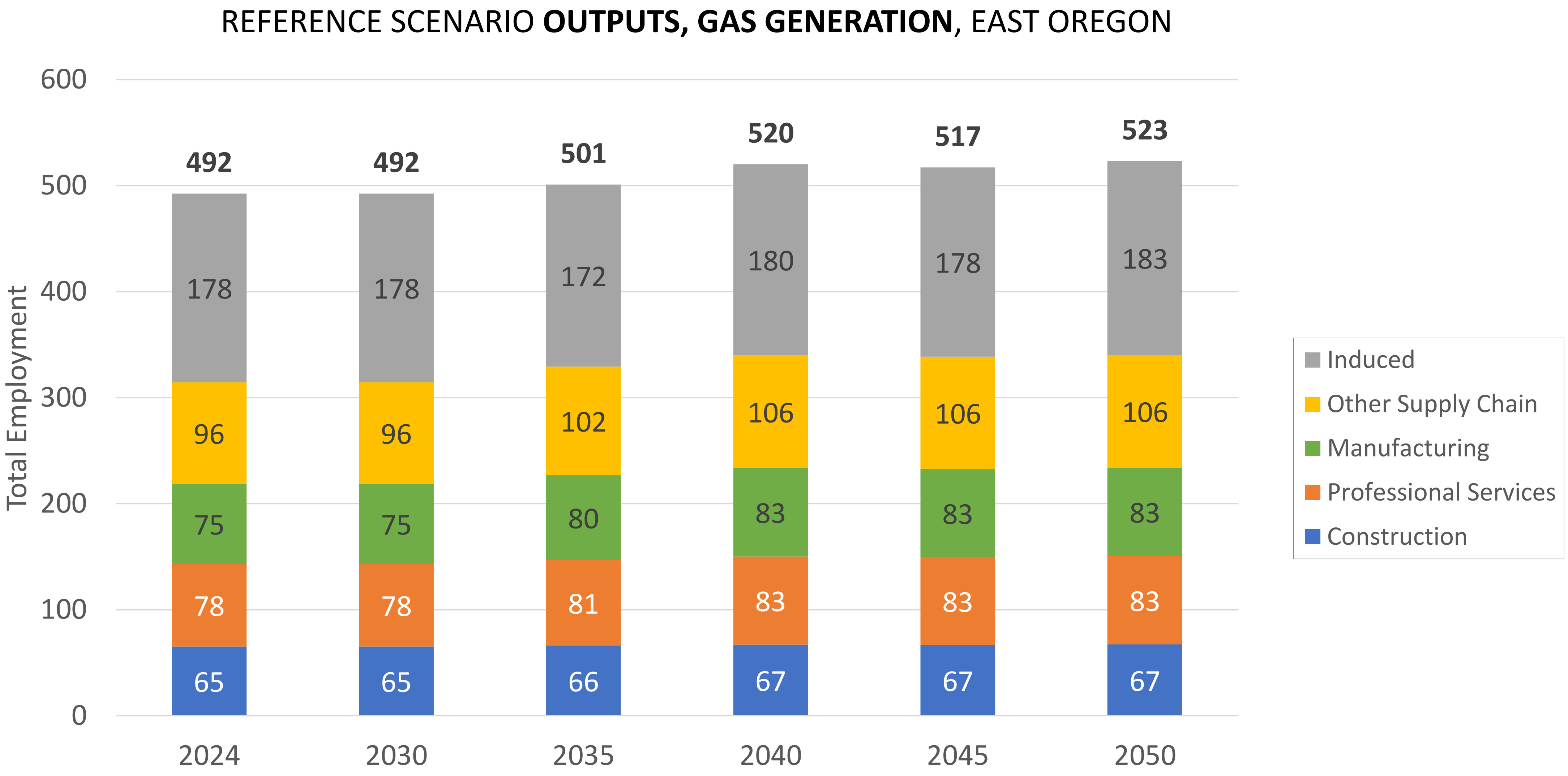



REFERENCE SCENARIO OUTPUTS, LAND-BASED WIND, EAST OREGON
Total Employment
6,000
5,000
4,000
3,000
2,000
1,000
0
2024
2030
2035
2040
2045
2050
496
476
2,705
4,212
4,553
5,184
594
288
826
208
790
915
421
1,268
306
1,302
977
444
1,345
335
1,453
1,103
494
1,514
381
1,692
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

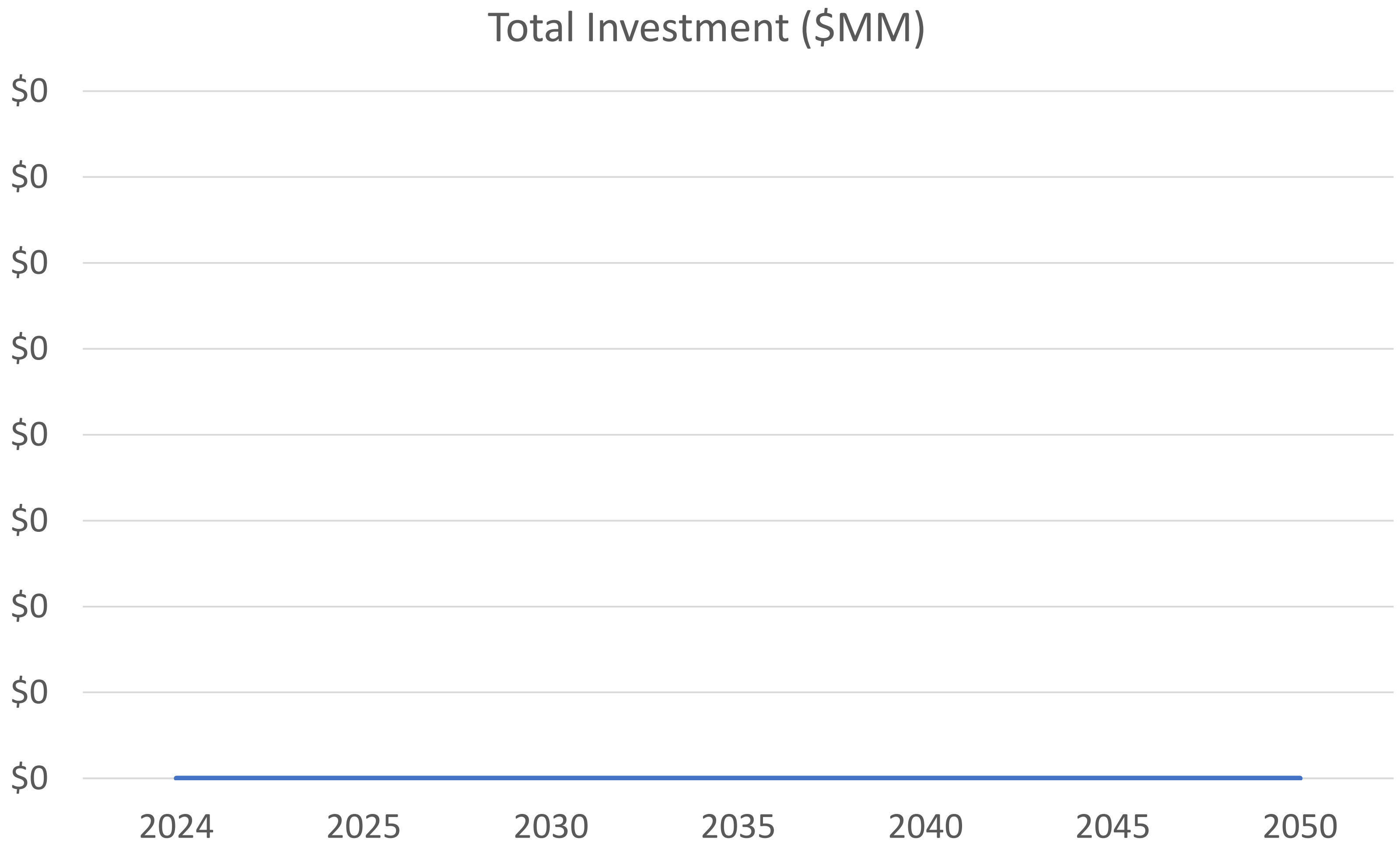
REFERENCE SCENARIO **INPUTS, GAS GENERATION**, EAST OREGON



The Gas Generation sub-sector includes existing natural gas plant capacity and newly installed clean gas capacity (including biogas and hydrogen gas), which causes the increase in total installed capacity from 2030 to 2050. No new natural gas generation is installed in Oregon throughout the study years.

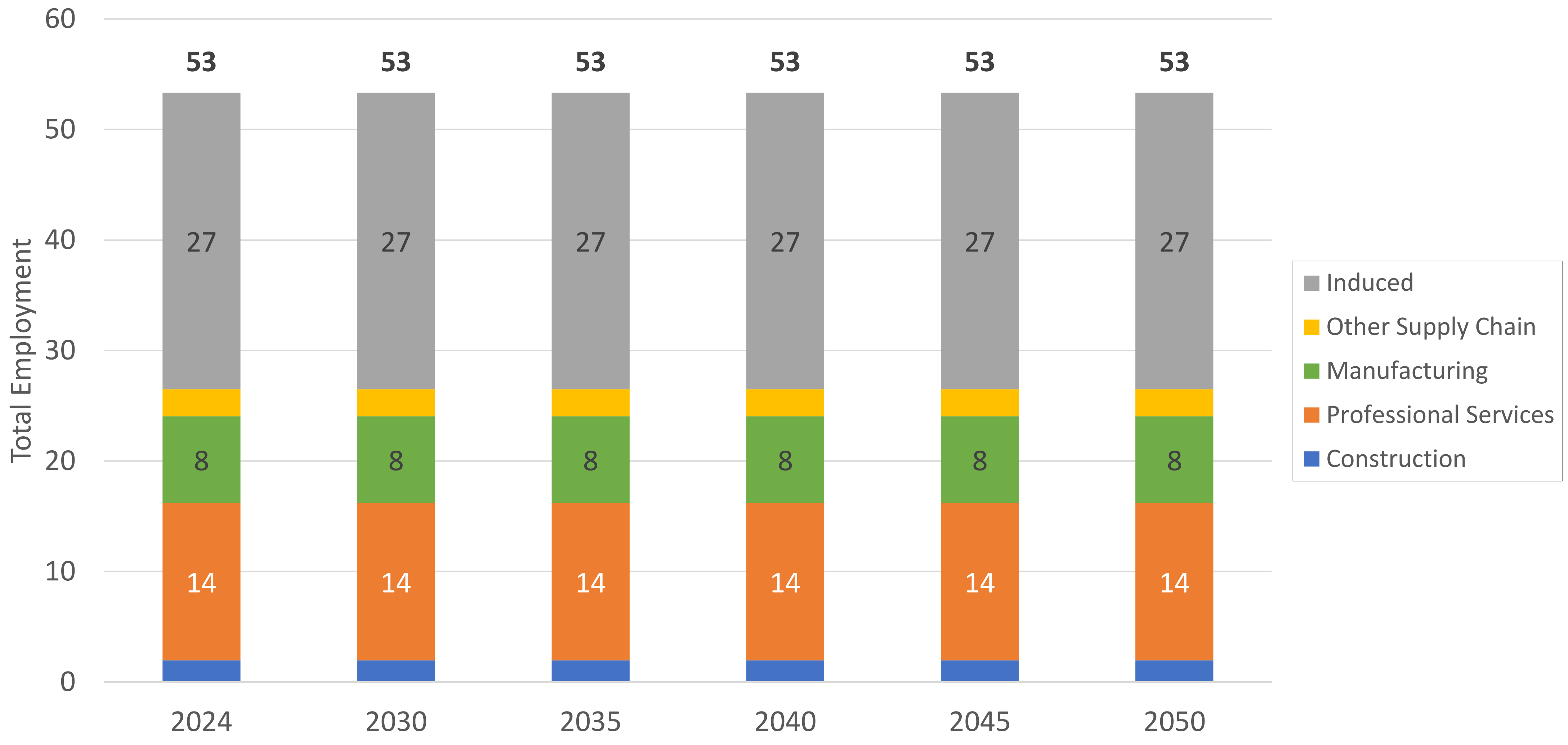

REFERENCE SCENARIO **OUTPUTS, GAS GENERATION**, EAST OREGON
Total Employment
600
500
400
300
200
100
0
2024
2030
2035
2040
2045
2050
492
492
501
520
517
523
178
178
172
180
178
183
96
96
102
106
106
106
75
75
80
83
83
83
78
78
81
83
83
83
65
65
66
67
67
67
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, NUCLEAR**, EAST OREGON

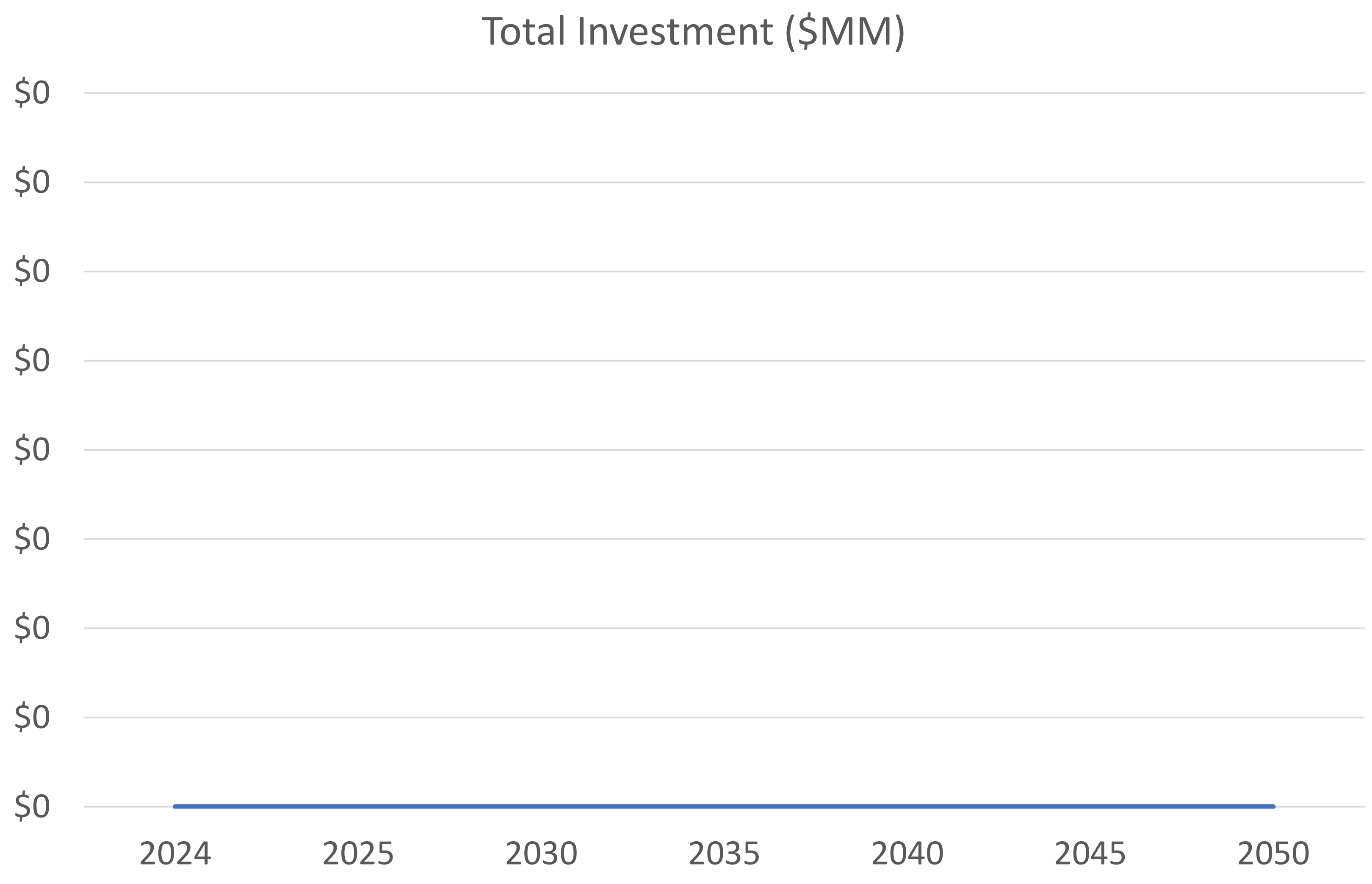


The EER model did not build nuclear generation in Oregon or any other states. Nuclear employment shows support services for existing nuclear generation in other states. These support services are assumed to stay the same throughout the study years.

REFERENCE SCENARIO **OUTPUTS, NUCLEAR**, EAST OREGON

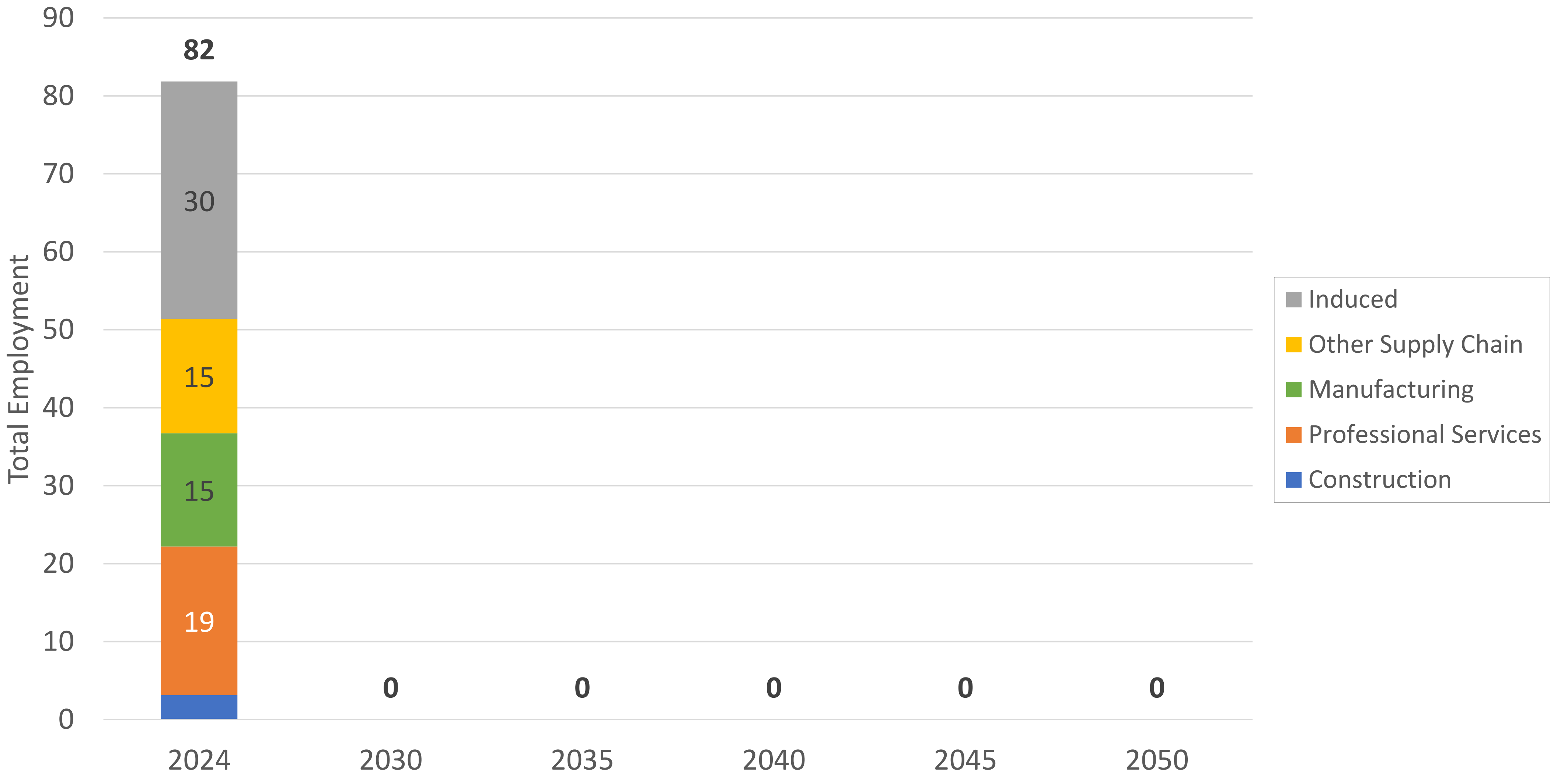


REFERENCE SCENARIO **INPUTS, OTHER FOSSIL GENERATION**, EAST OREGON

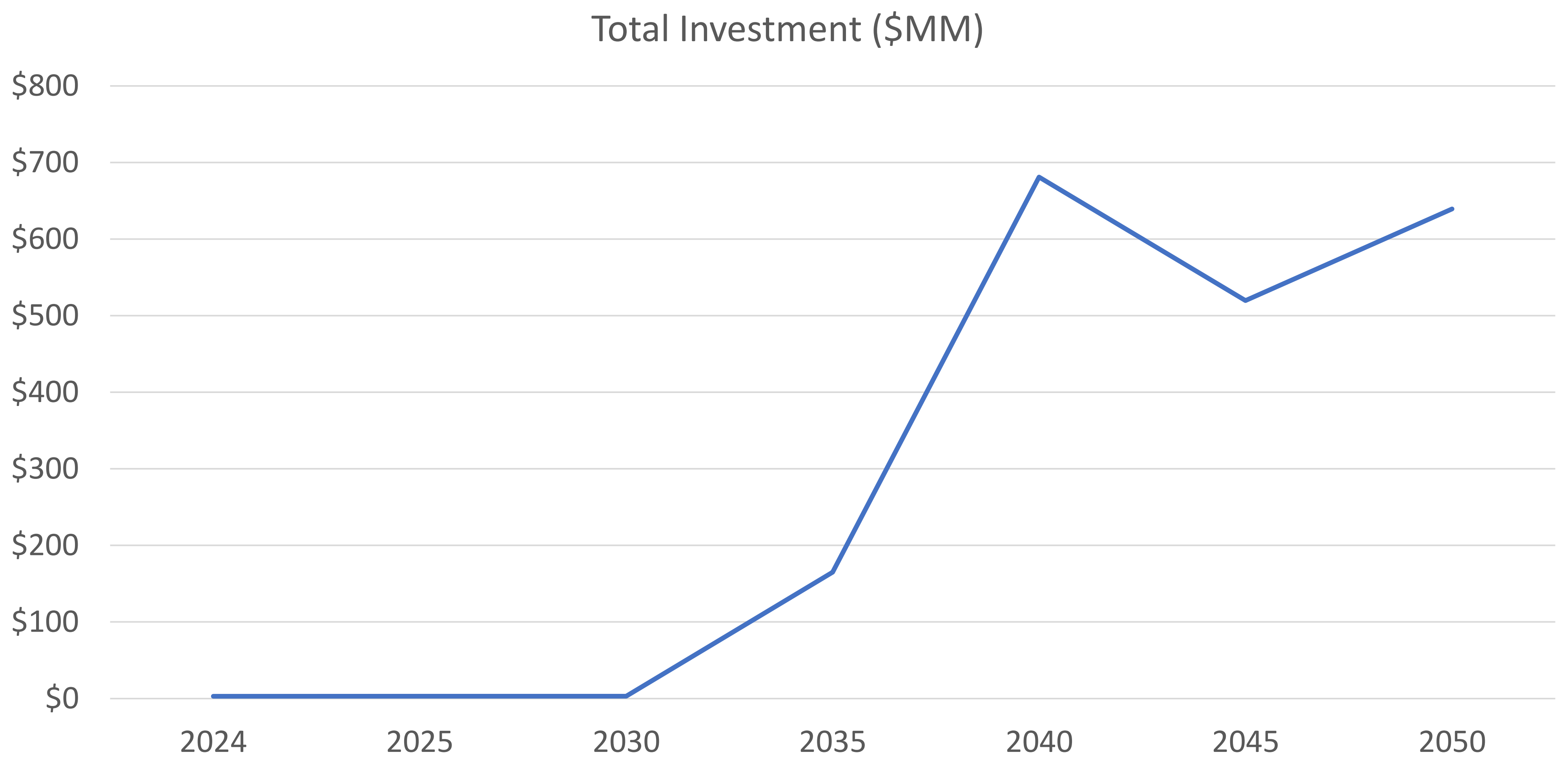


The EER model did not build petroleum or coal generation in Oregon. Other fossil generation employment shows support services for existing coal generation in neighboring states. These support services are assumed to decline with retirements throughout the study years, though there is uncertainty.

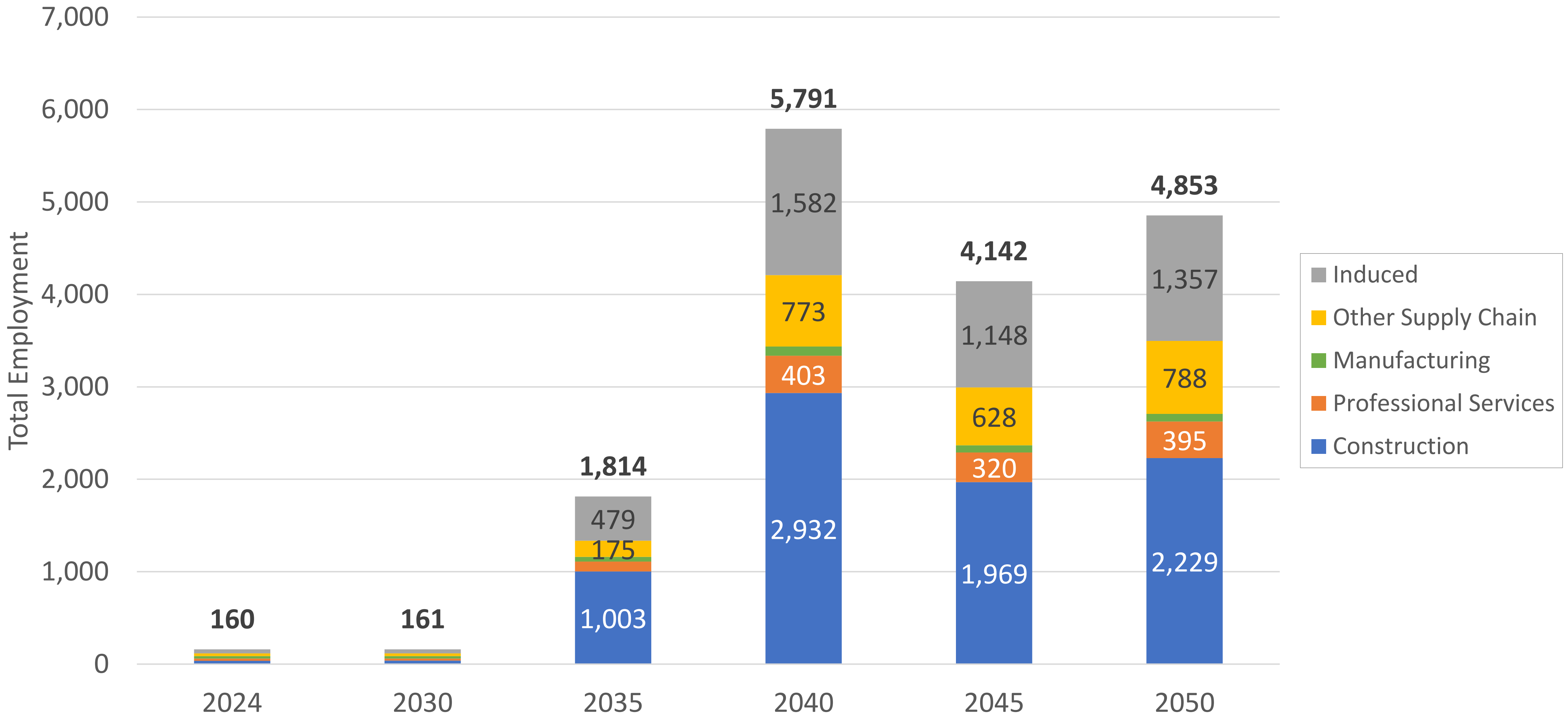
REFERENCE SCENARIO **OUTPUTS, OTHER FOSSIL GENERATION**, EAST OREGON



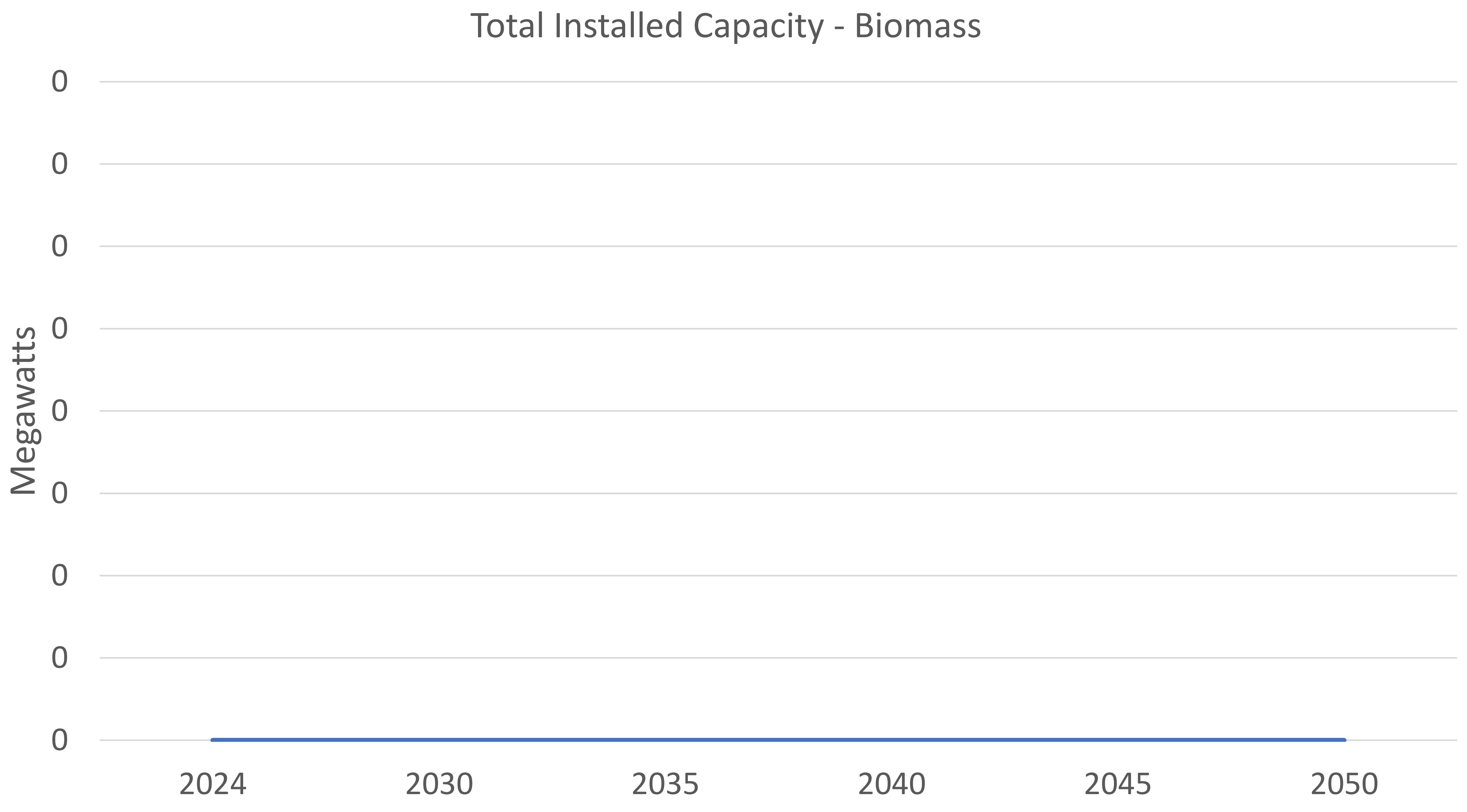
REFERENCE SCENARIO **INPUTS, OTHER RENEWABLE GENERATION - GEOTHERMAL**, EAST OREGON



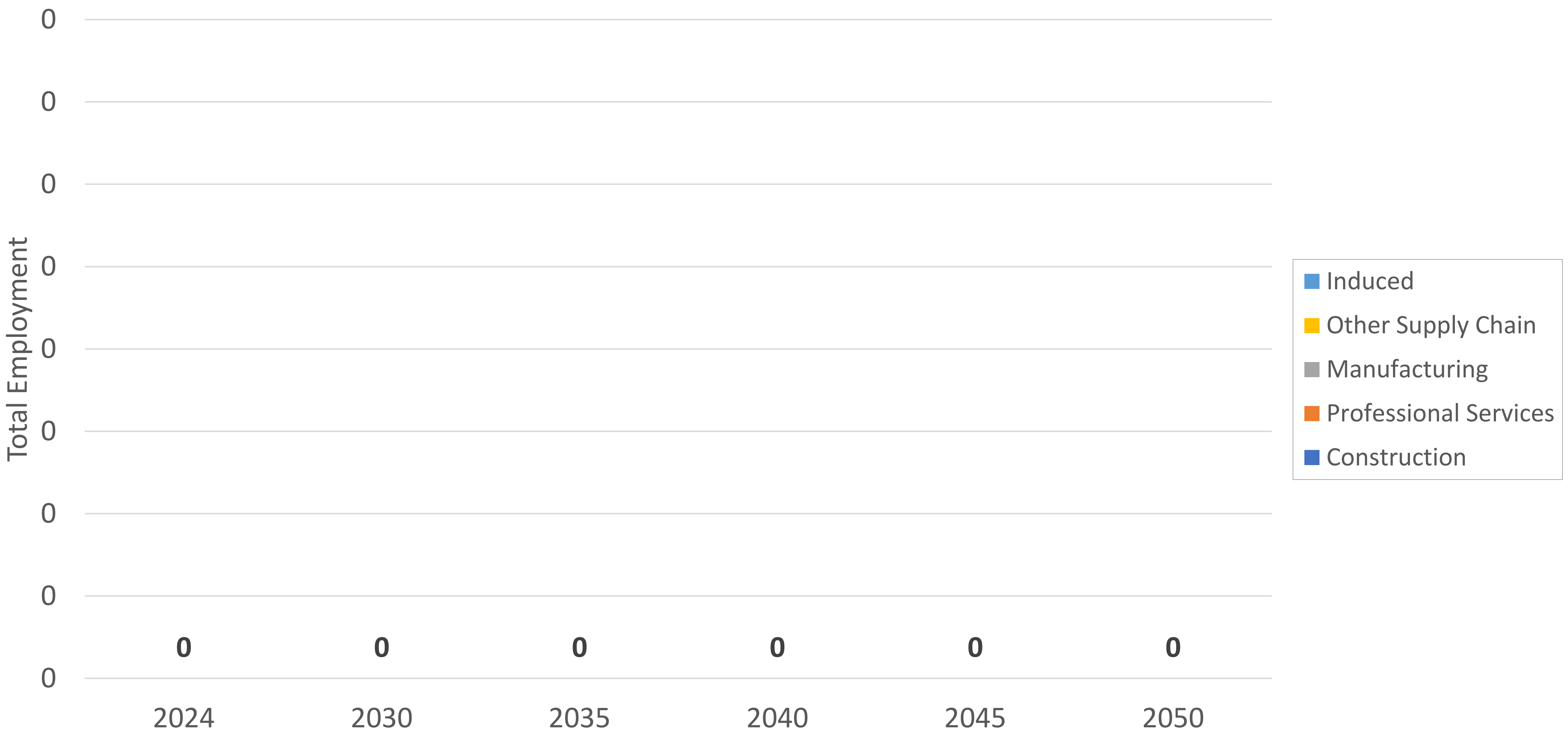
REFERENCE SCENARIO, **OTHER RENEWABLE GENERATION – GEOTHERMAL**, EAST OREGON



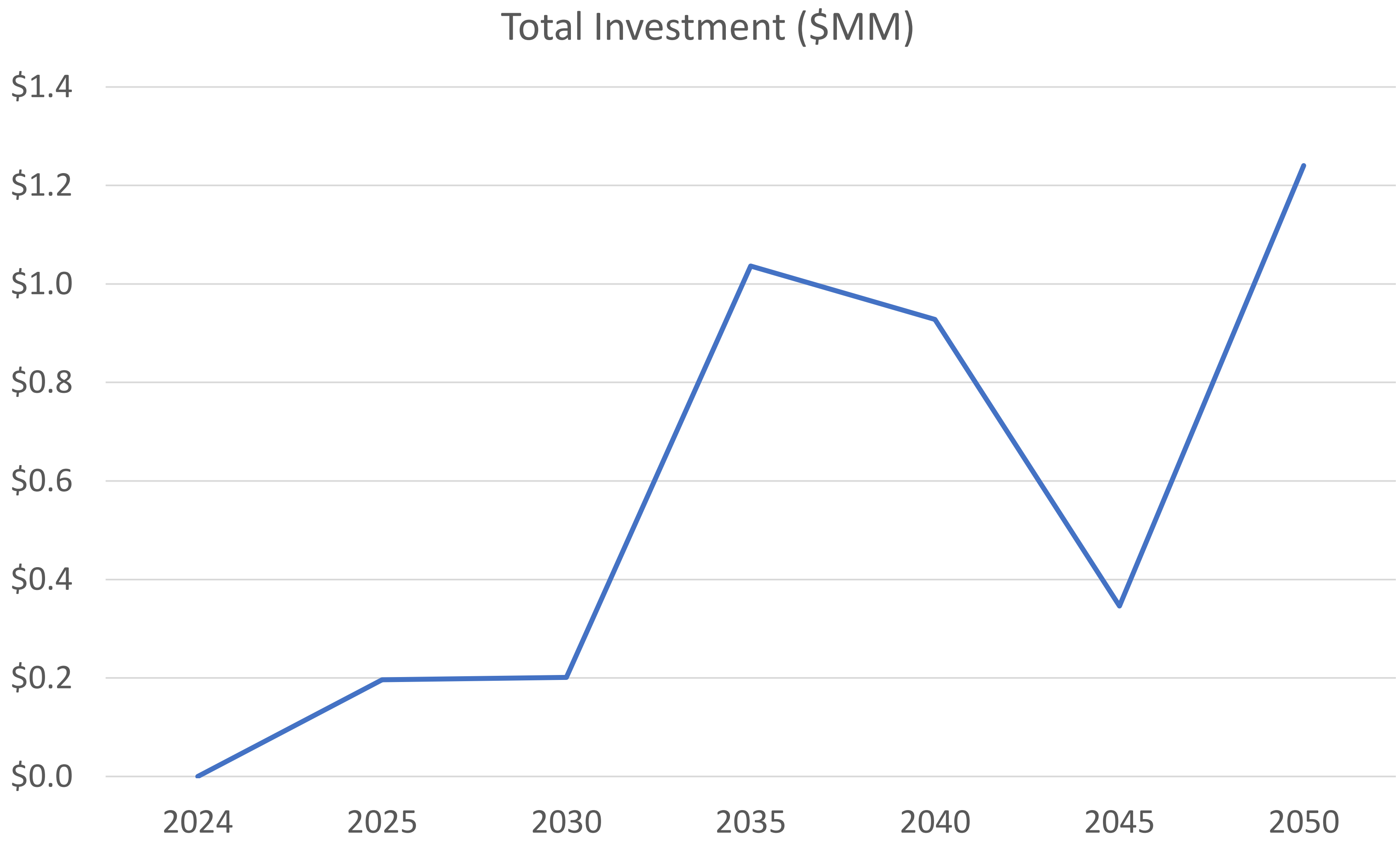
REFERENCE SCENARIO **INPUTS, OTHER RENEWABLE GENERATION - BIOMASS**, EAST OREGON



REFERENCE SCENARIO **OUTPUTS, OTHER RENEWABLE GENERATION – BIOMASS**, EAST OREGON

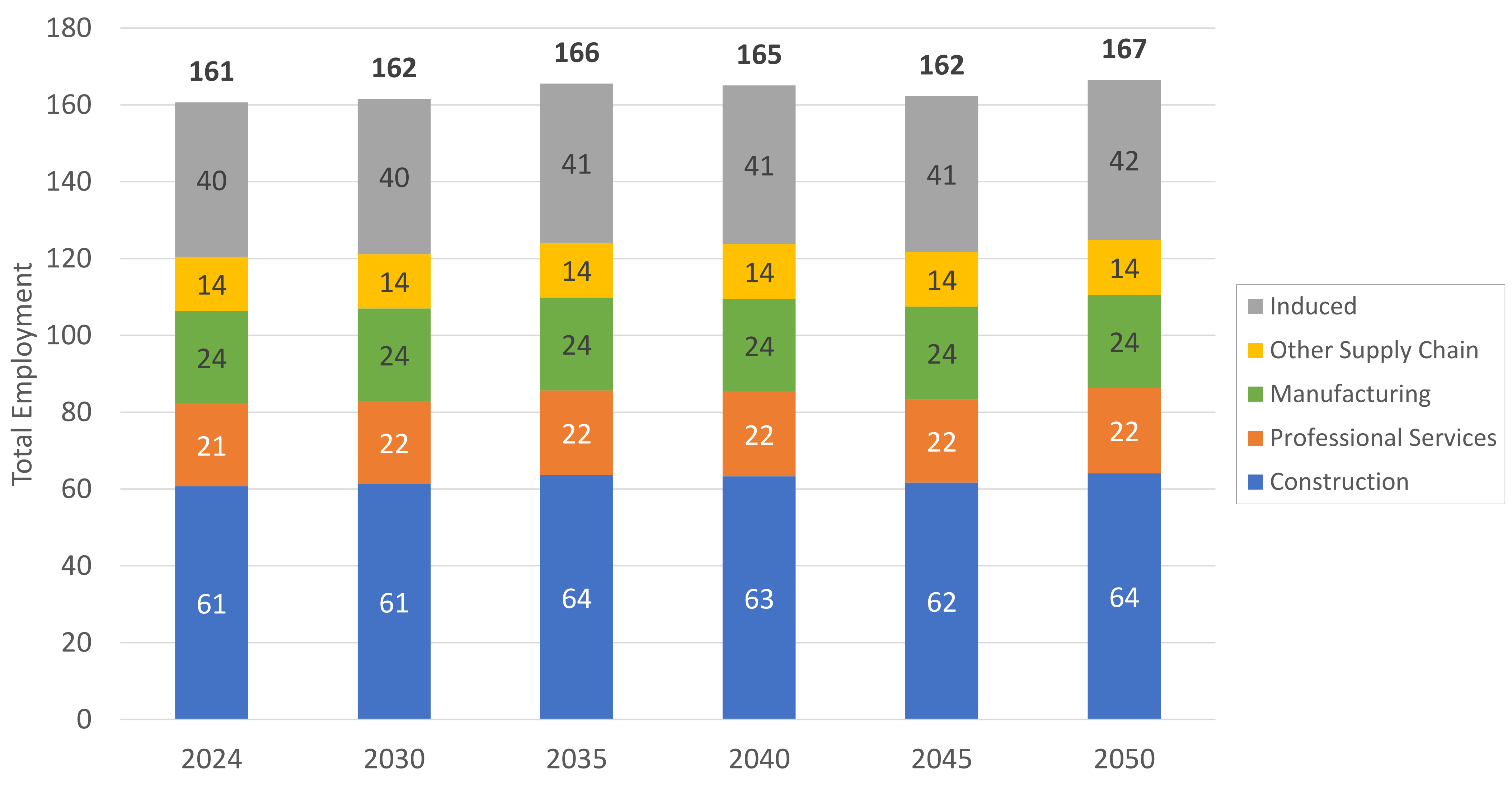


REFERENCE SCENARIO **INPUTS, STORAGE**, EAST OREGON

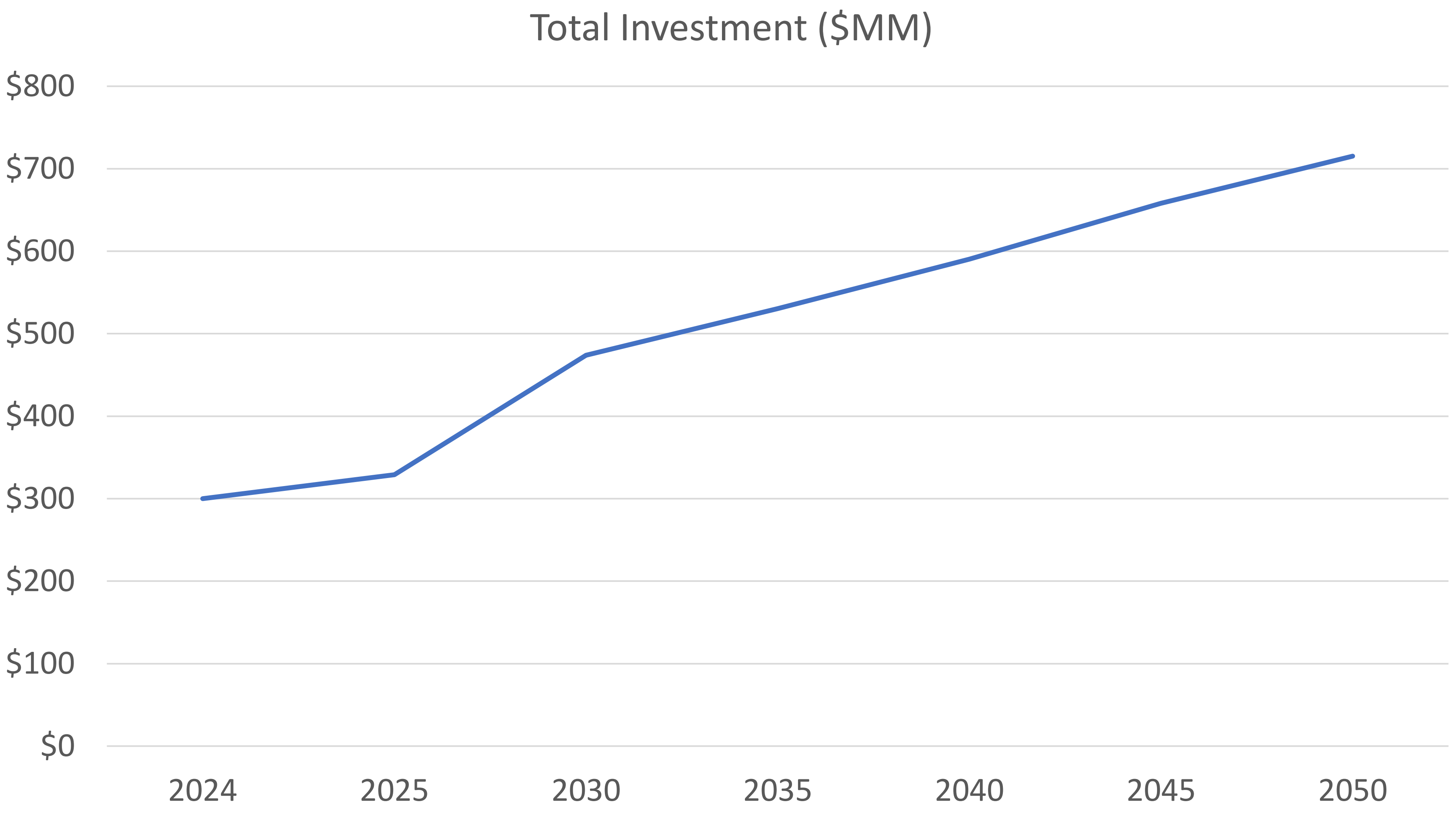


The investment for Storage found by the EER model is incremental to existing Storage capacity. The baseline for 2024 is shown as $0.

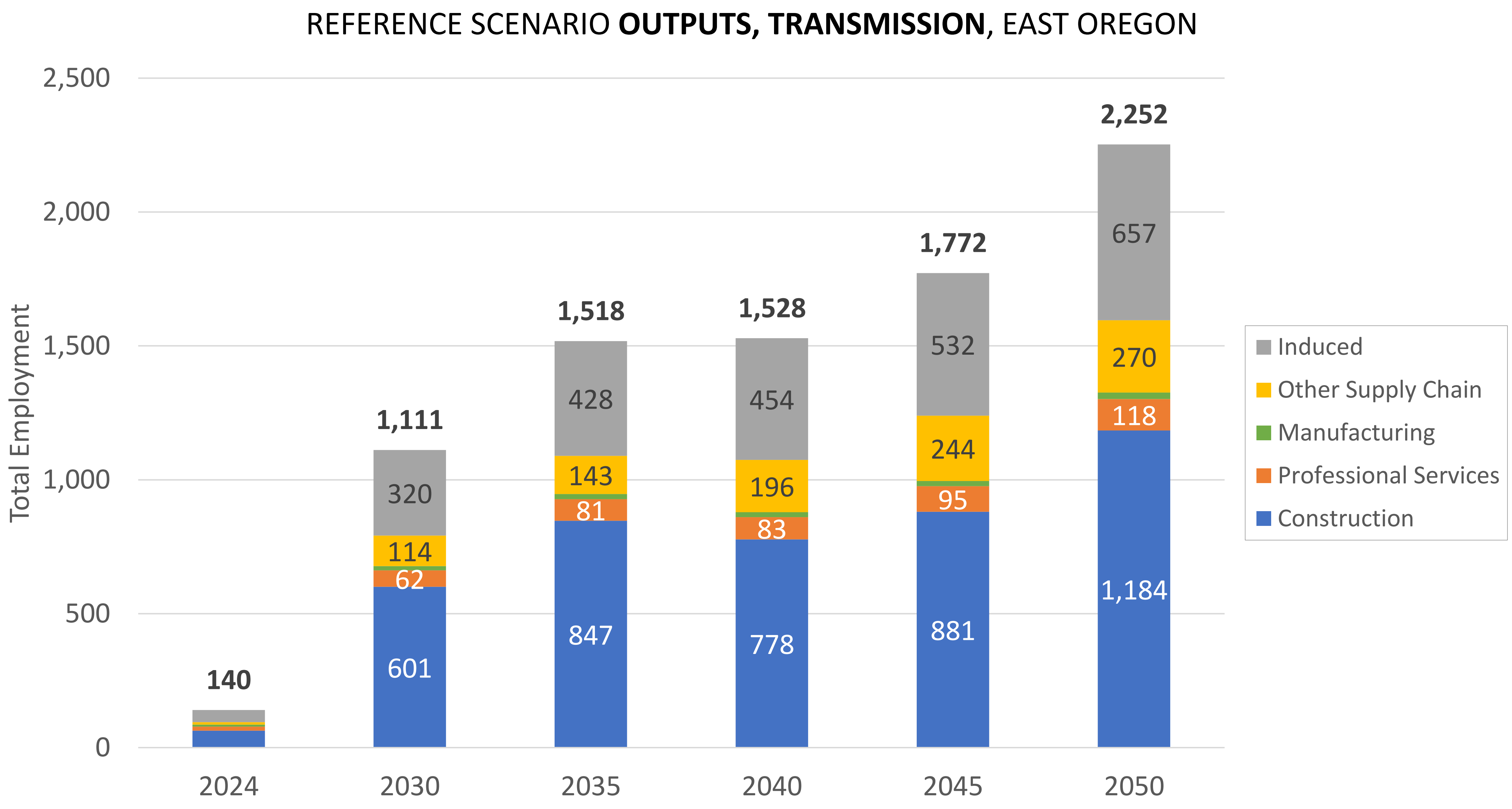
REFERENCE SCENARIO **OUTPUTS, STORAGE**, EAST OREGON



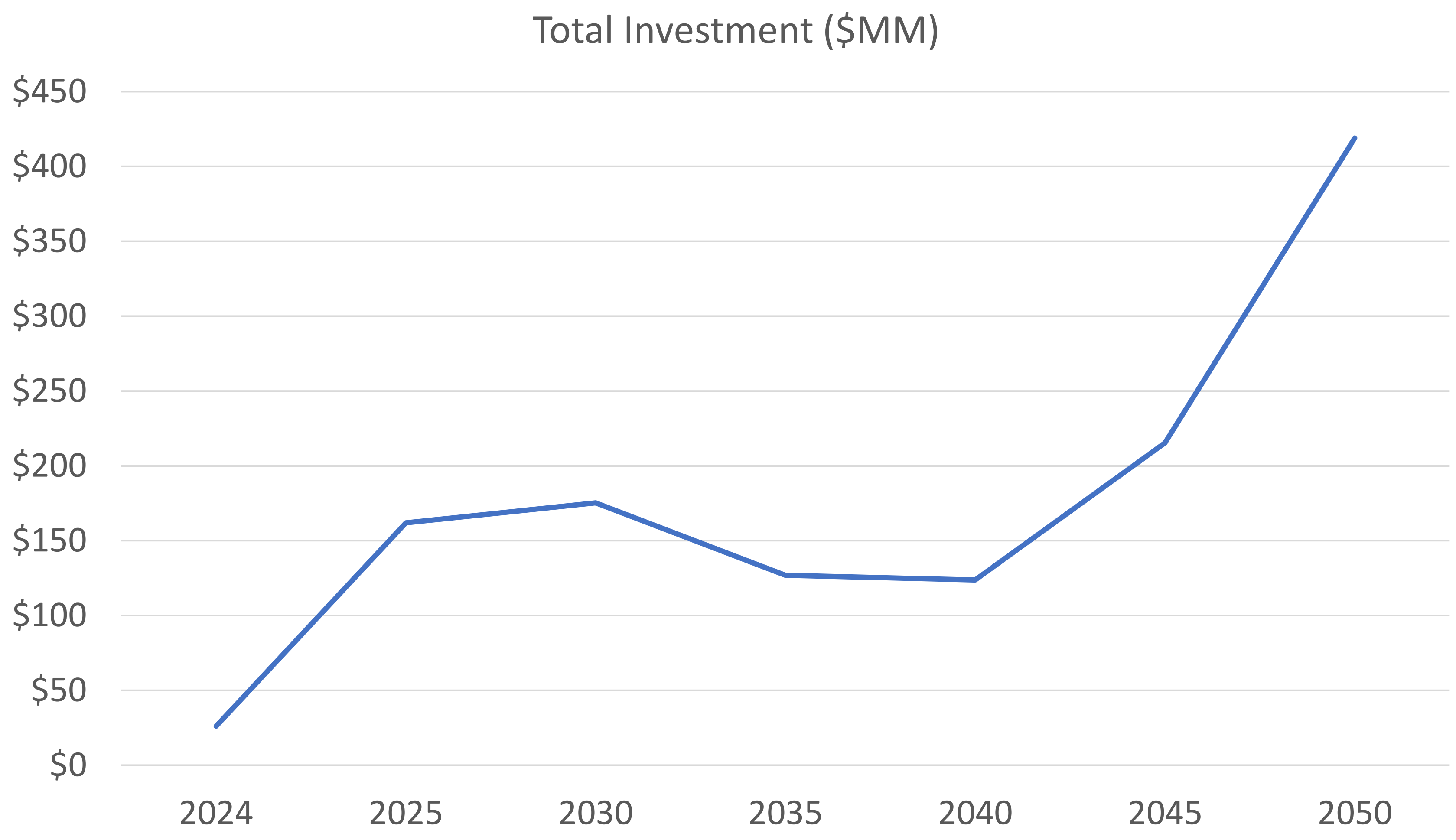
REFERENCE SCENARIO **INPUTS, TRANSMISSION**, EAST OREGON



Investments include both [intra- and inter-zonal transmission] in East Oregon.

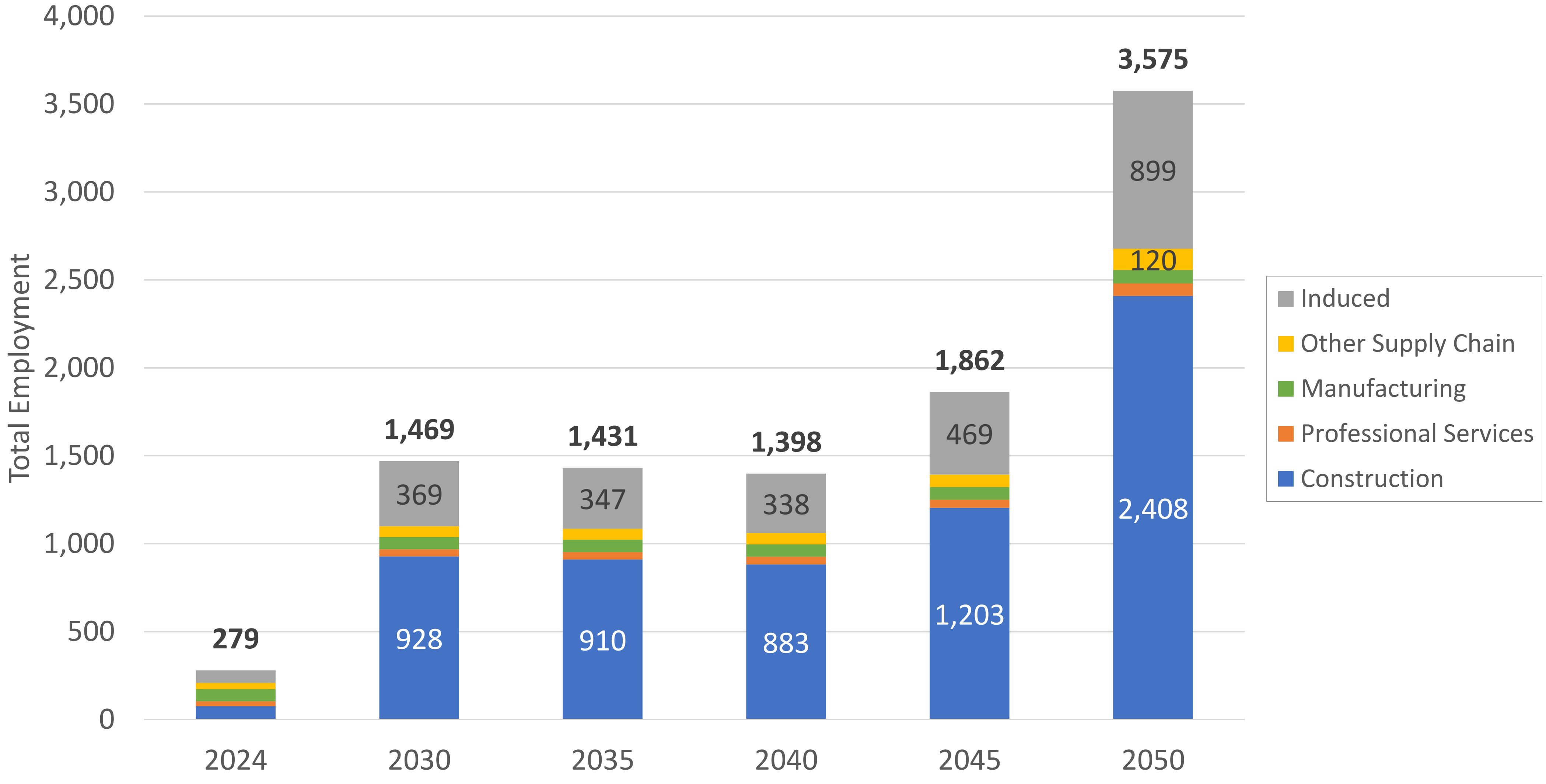

REFERENCE SCENARIO OUTPUTS, TRANSMISSION, EAST OREGON
Total Employment
2,500
2,000
1,500
1,000
500
0
2024
2030
2035
2040
2045
2050
140
1,111
1,518
1,528
1,772
2,252
601
62
114
320
847
81
143
428
778
83
196
454
881
95
244
532
1,184
118
270
657
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, UTILITY SOLAR**, EAST OREGON



Significant capital investments required to economically build out utility-scale solar electric generating capacity to meet load demand.

REFERENCE SCENARIO **OUTPUTS, UTILITY SOLAR**, EAST OREGON

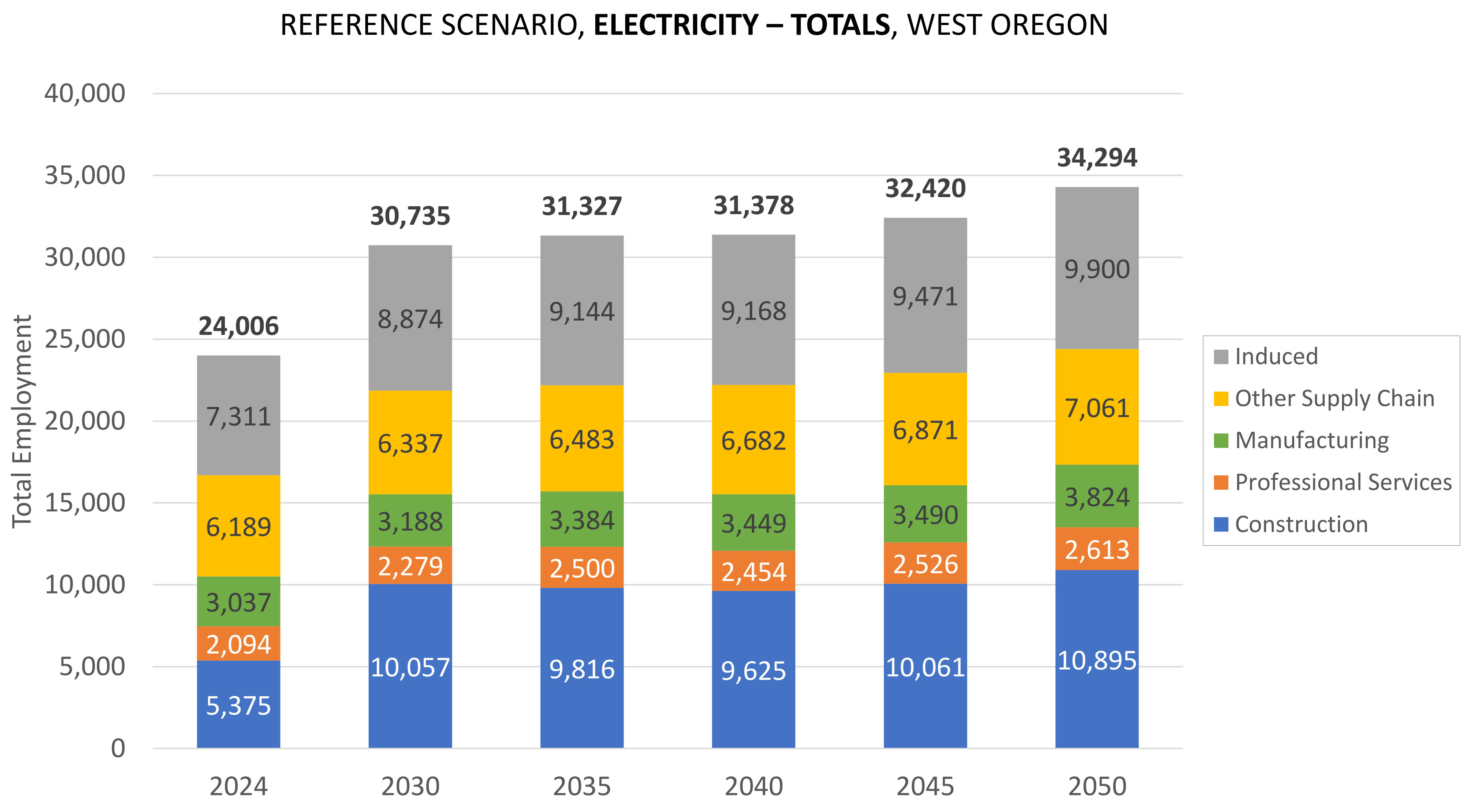


ELECTRICITY: REFERENCE,
WEST OREGON*

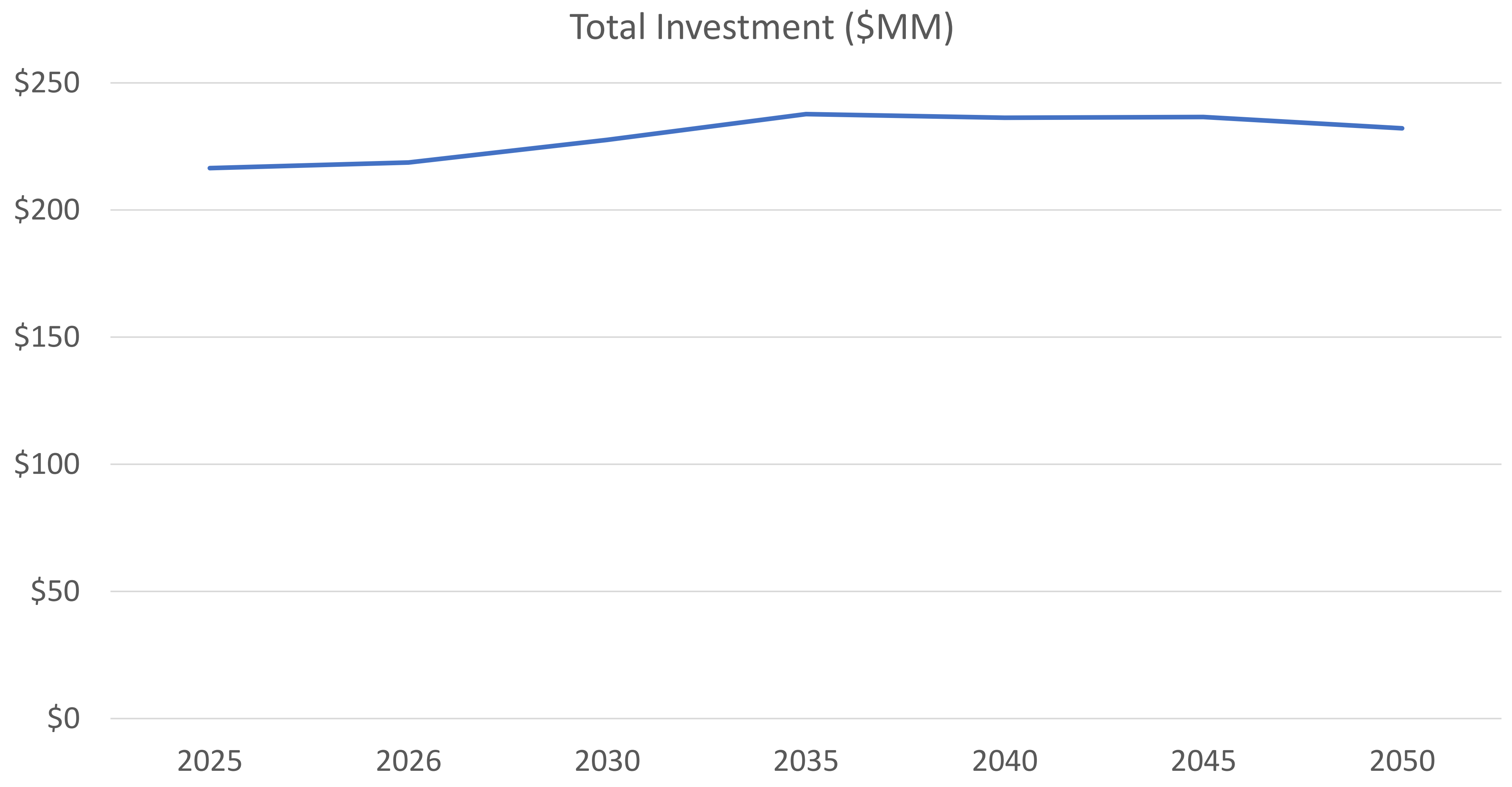
SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Distribution	7,960	10,185	10,686	11,295	11,874	12,231
Hydropower	2,494	3,236	2,621	2,617	2,616	2,616
Land-Based Wind	1,692	2,171	2,675	3,023	3,259	4,459
Gas Generation	497	497	1,932	1,077	1,264	948
Nuclear	347	347	347	347	347	347
Other Ren. Gen. – Geothermal	0	0	0	0	0	0
Storage	1,884	1,963	1,889	1,889	1,888	1,894
Transmission	2,079	3,270	3,909	3,926	4,363	5,139
Utility Solar	1,009	3,399	1,441	1,445	1,227	1,227
Distributed Solar	5,068	5,274	5,474	5,406	5,349	5,200
Sub-total	**23,031**	**30,342**	**30,975**	**31,025**	**32,188**	**34,061**
Change		**7,311**	**7,944**	**7,994**	**9,157**	**11,030**
Displacement Sub-Sectors						
Other Fossil Generation	345	41	0	0	0	0
Other Ren. Gen. – Biomass	630	352	352	353	232	233
Sub-total	**975**	**393**	**352**	**353**	**232**	**233**
Change		**-582**	**-623**	**-622**	**-743**	**-742**
Electricity OVERALL	**24,006**	**30,735**	**31,327**	**31,378**	**32,420**	**34,294**
Net Change from 2024		**6,729**	**7,321**	**7,372**	**8,414**	**10,288**

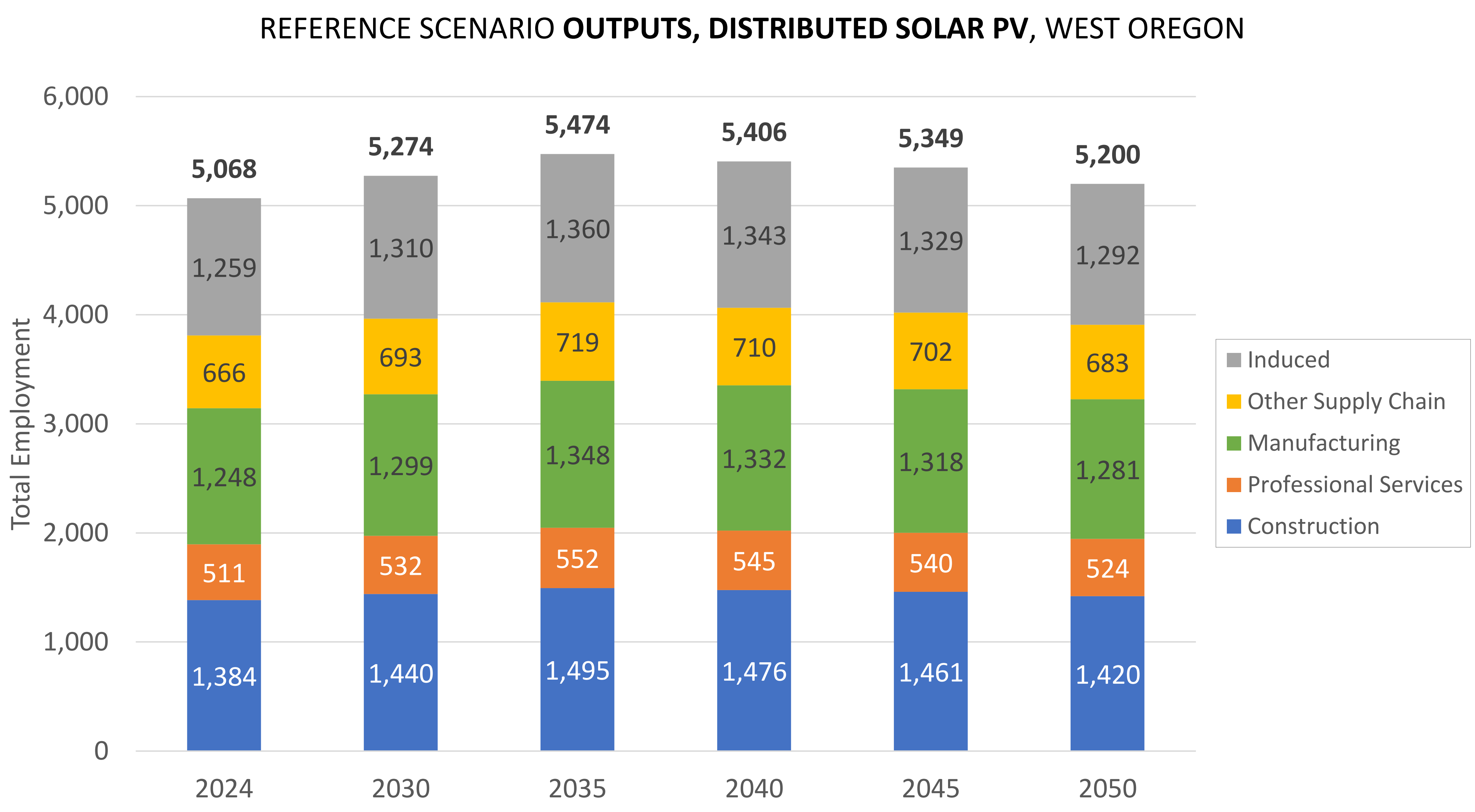
**Electricity: Reference, West Oregon employment by sub-sector and year*

**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

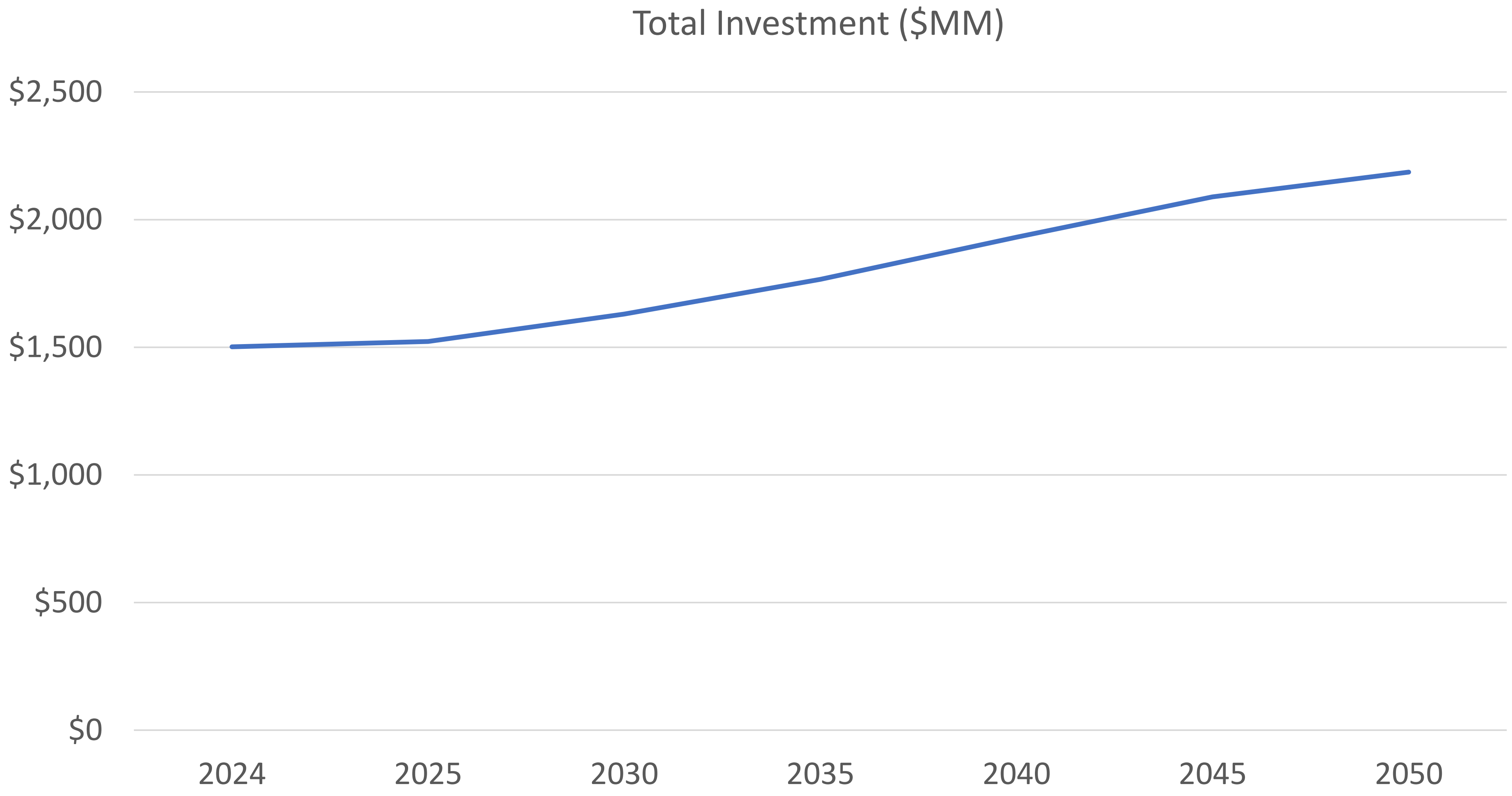

REFERENCE SCENARIO, ELECTRICITY – TOTALS, WEST OREGON
Total Employment
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2024
2030
2035
2040
2045
2050
24,006
30,735
31,327
31,378
32,420
34,294
7,311
6,189
3,037
2,094
5,375
8,874
6,337
3,188
2,279
10,057
9,144
6,483
3,384
2,500
9,816
9,168
6,682
3,449
2,454
9,625
9,471
6,871
3,490
2,526
10,061
9,900
7,061
3,824
2,613
10,895
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

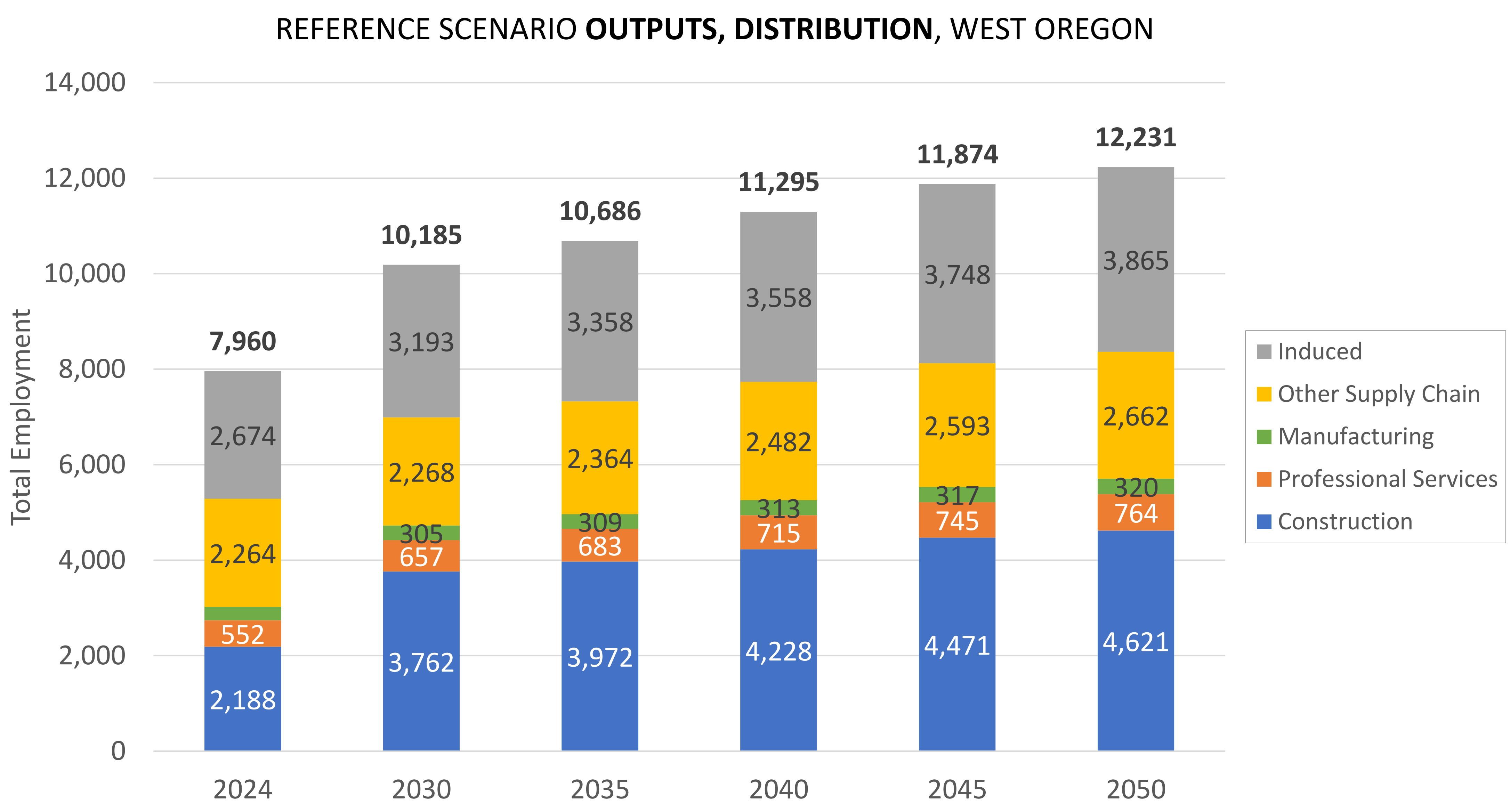
REFERENCE SCENARIO **INPUTS, DISTRIBUTED SOLAR PV**, WEST OREGON



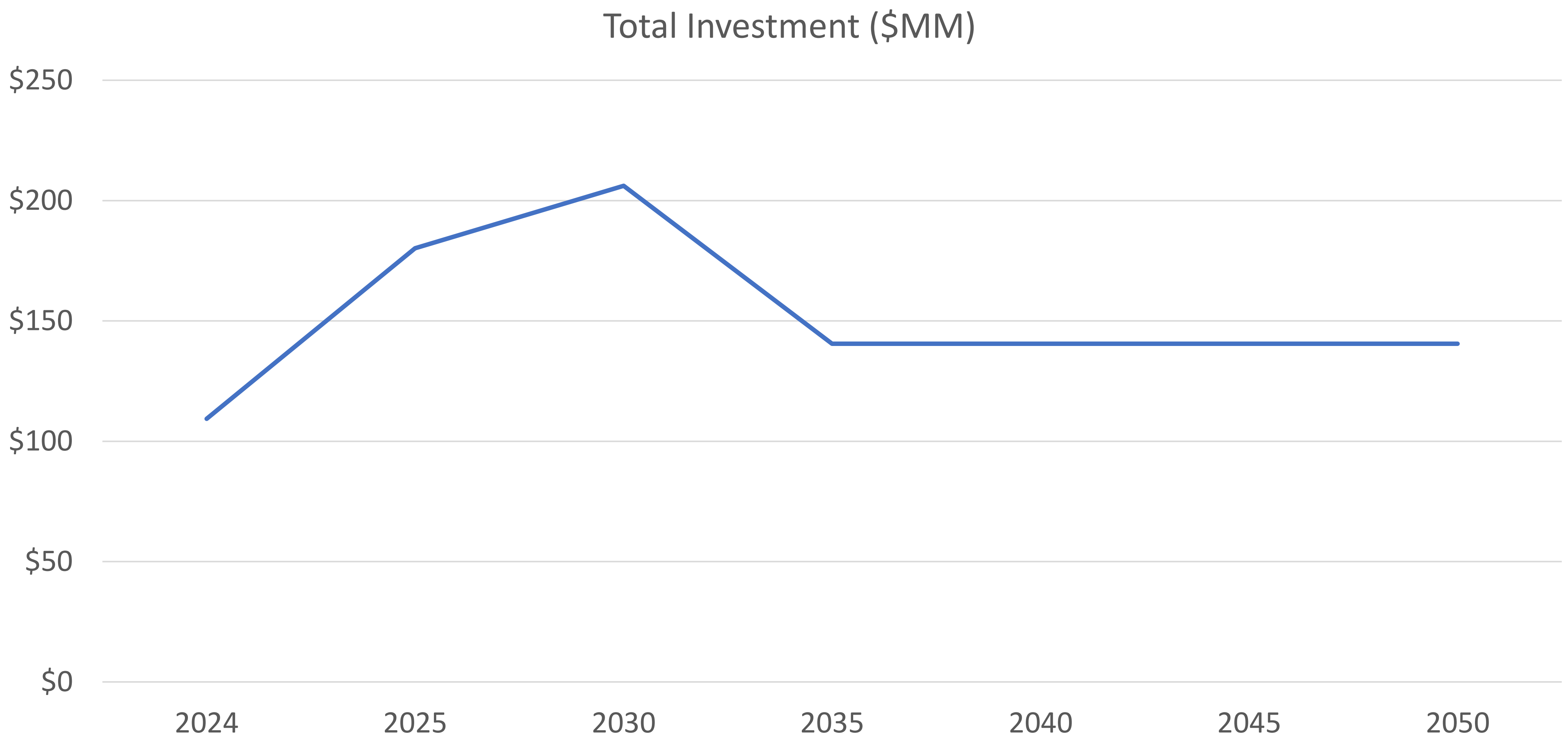

REFERENCE SCENARIO OUTPUTS, DISTRIBUTED SOLAR PV, WEST OREGON
Total Employment
6,000
5,000
4,000
3,000
2,000
1,000
0
2024
2030
2035
2040
2045
2050
5,068
5,274
5,474
5,406
5,349
5,200
1,259
1,310
1,360
1,343
1,329
1,292
666
693
719
710
702
683
1,248
1,299
1,348
1,332
1,318
1,281
511
532
552
545
540
524
1,384
1,440
1,495
1,476
1,461
1,420
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

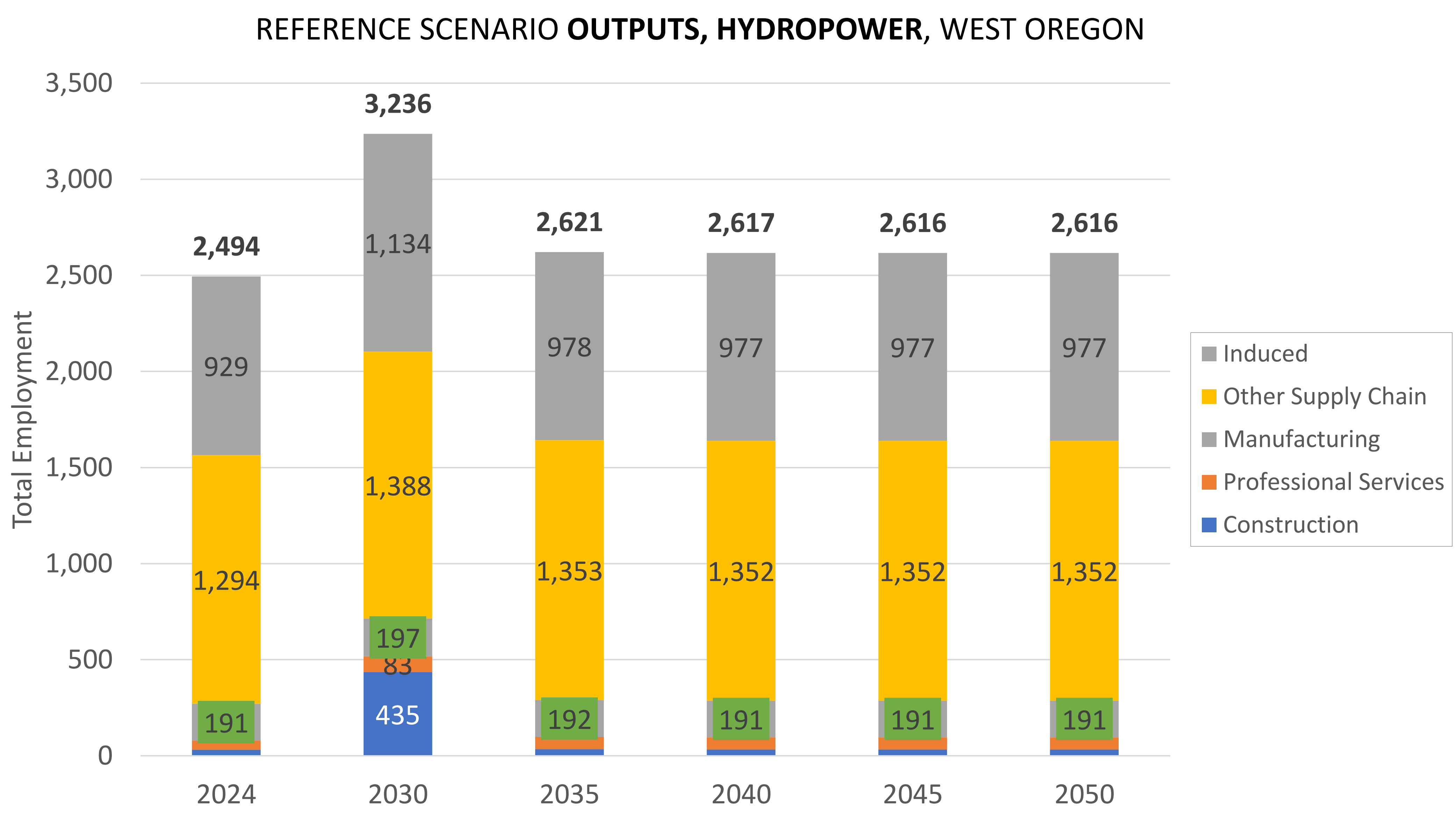
REFERENCE SCENARIO **INPUTS, DISTRIBUTION**, WEST OREGON



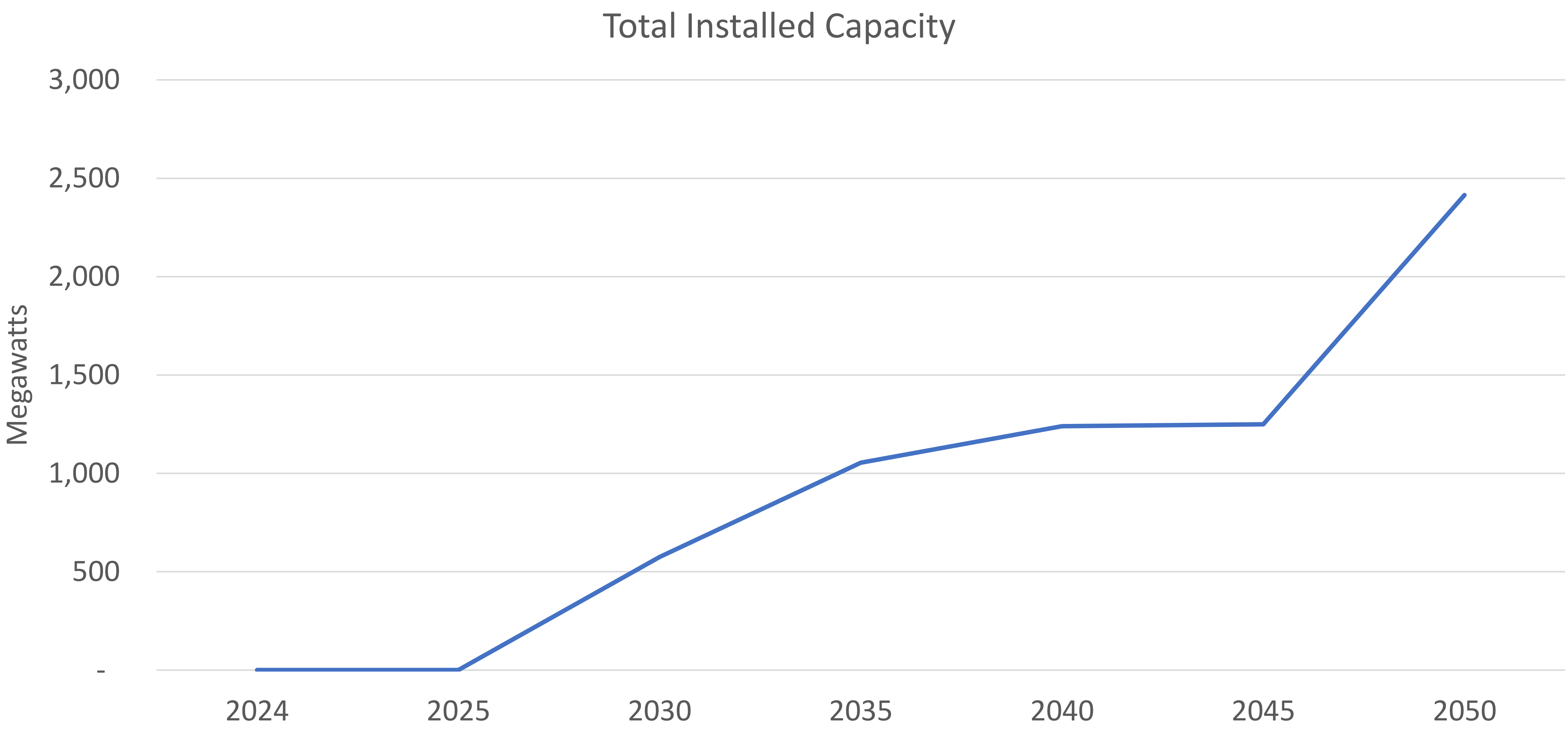

REFERENCE SCENARIO **OUTPUTS, DISTRIBUTION**, WEST OREGON
Total Employment
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2024
2030
2035
2040
2045
2050
7,960
2,674
2,264
552
2,188
10,185
3,193
2,268
305
657
3,762
10,686
3,358
2,364
309
683
3,972
11,295
3,558
2,482
313
715
4,228
11,874
3,748
2,593
317
745
4,471
12,231
3,865
2,662
320
764
4,621
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, HYDROPOWER**, WEST OREGON

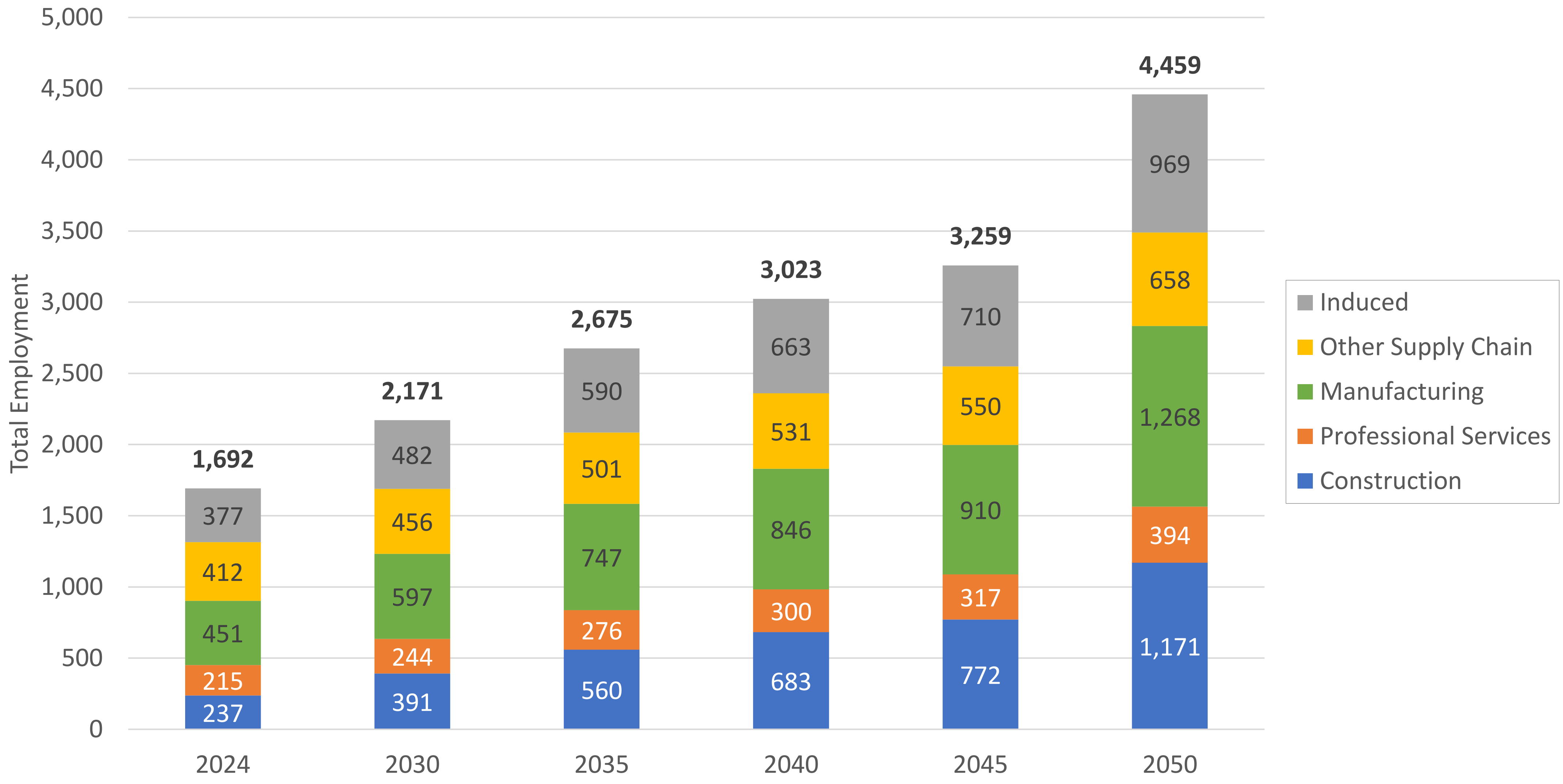



REFERENCE SCENARIO **OUTPUTS, HYDROPOWER**, WEST OREGON
Total Employment
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2,494
929
1,294
191
3,236
1,134
1,388
197
83
435
2,621
978
1,353
192
2,617
977
1,352
191
2,616
977
1,352
191
2,616
977
1,352
191
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

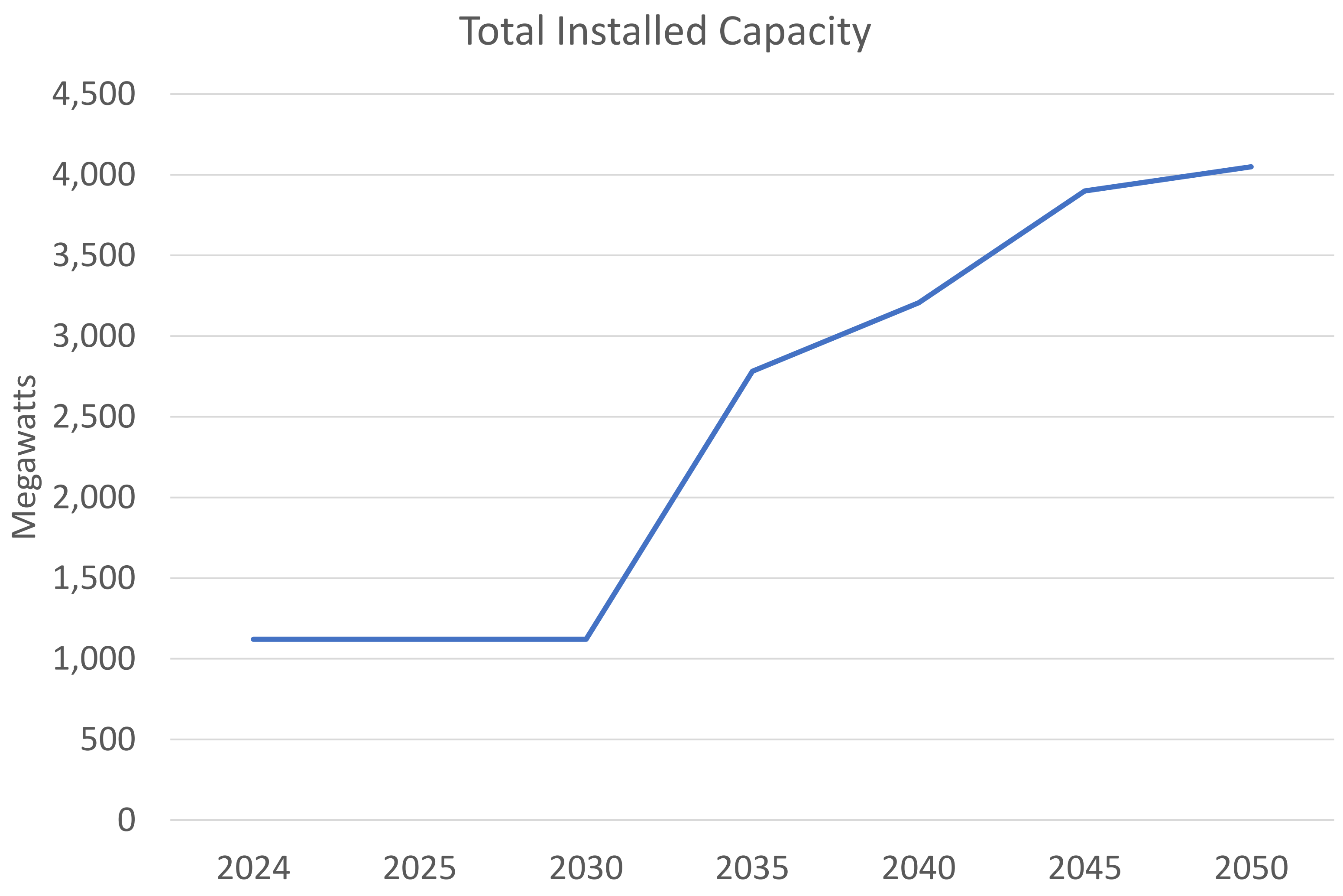
REFERENCE SCENARIO **INPUTS, LAND-BASED WIND**, WEST OREGON



REFERENCE SCENARIO **OUTPUTS, LAND-BASED WIND**, WEST OREGON

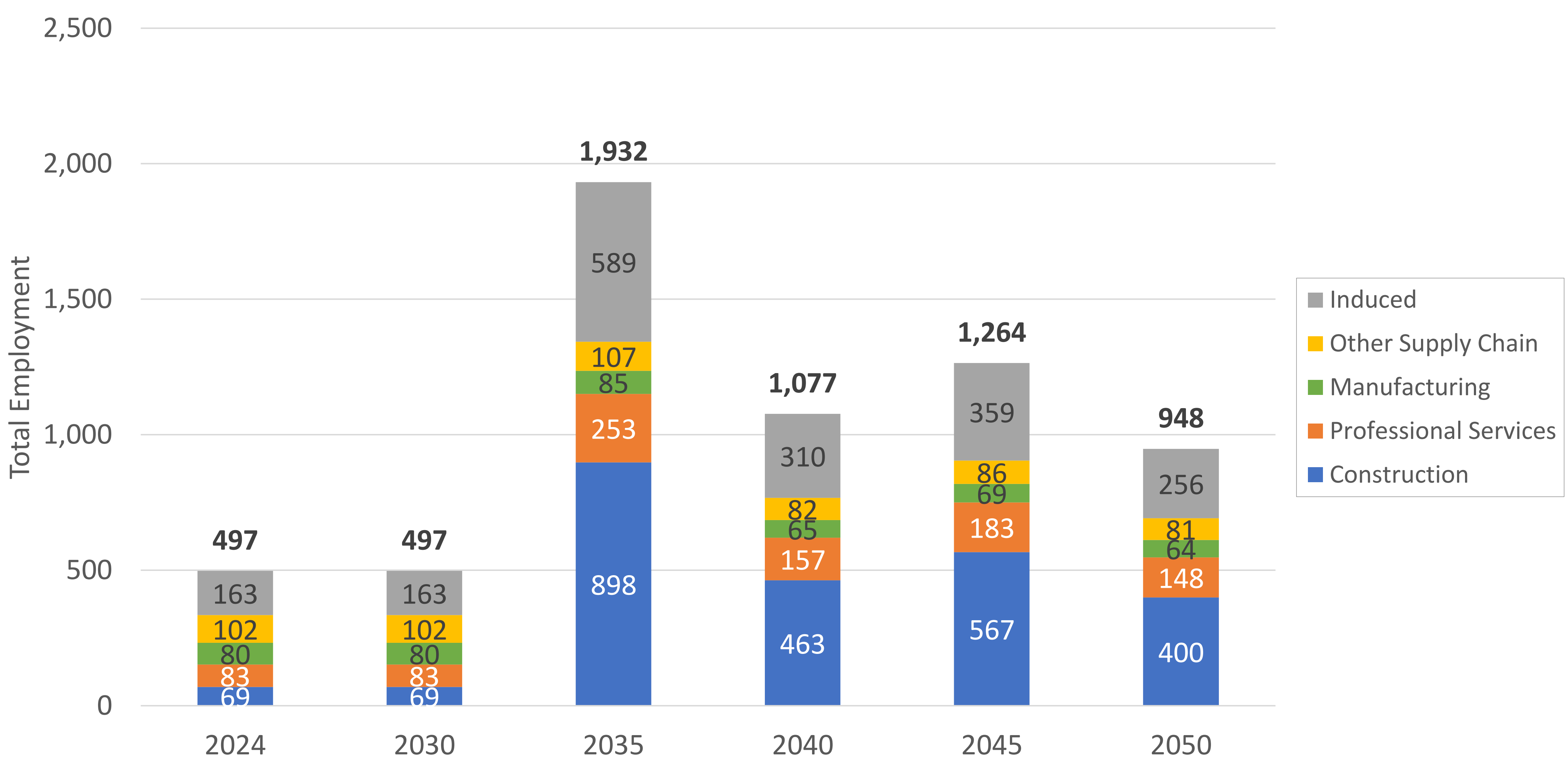


REFERENCE SCENARIO **INPUTS, GAS GENERATION**, WEST OREGON

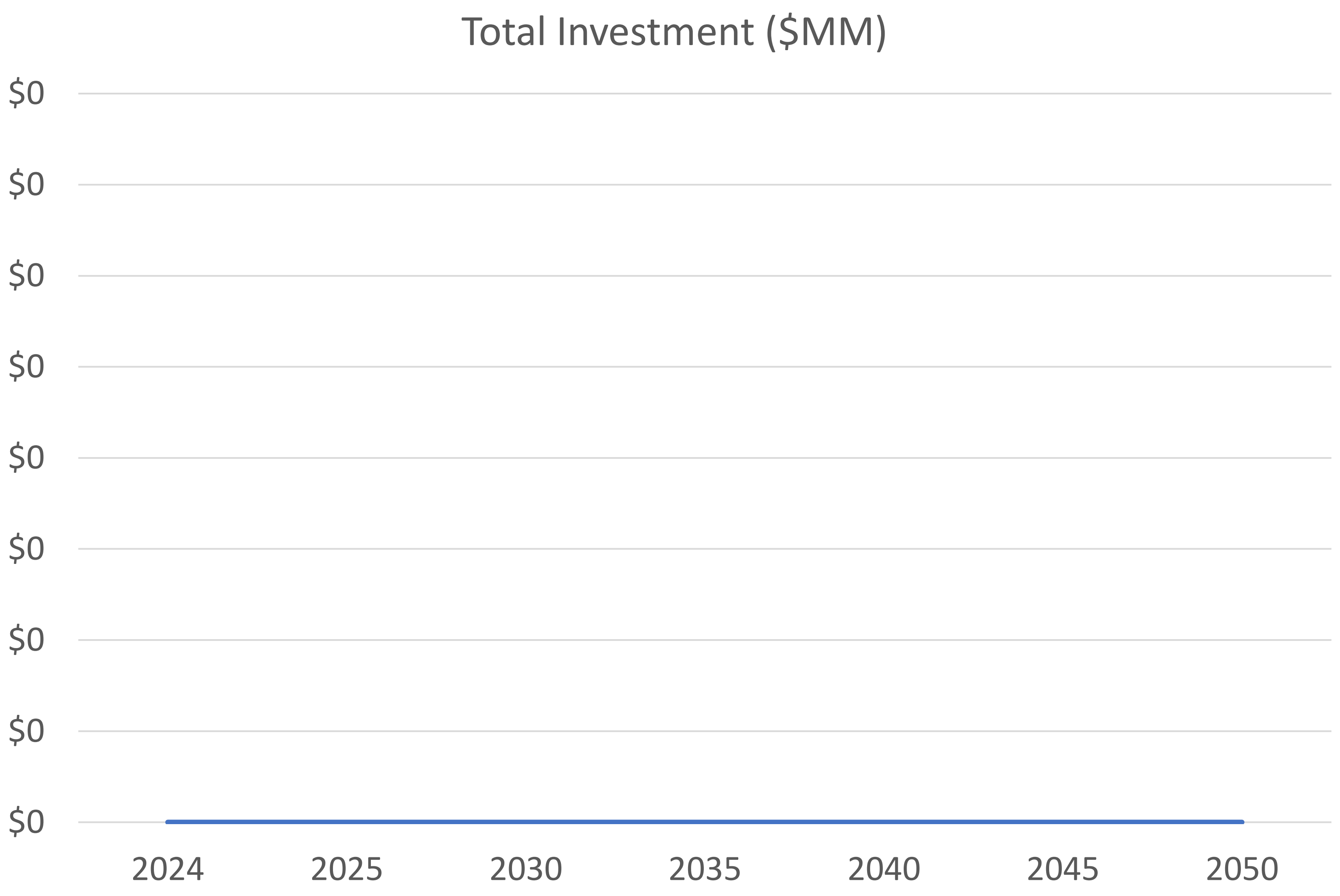


The Gas Generation sub-sector includes existing natural gas plant capacity and newly installed clean gas capacity (including biogas and hydrogen gas), which causes the increase in total installed capacity from 2030 to 2050. No new natural gas generation is installed in Oregon throughout the study years.

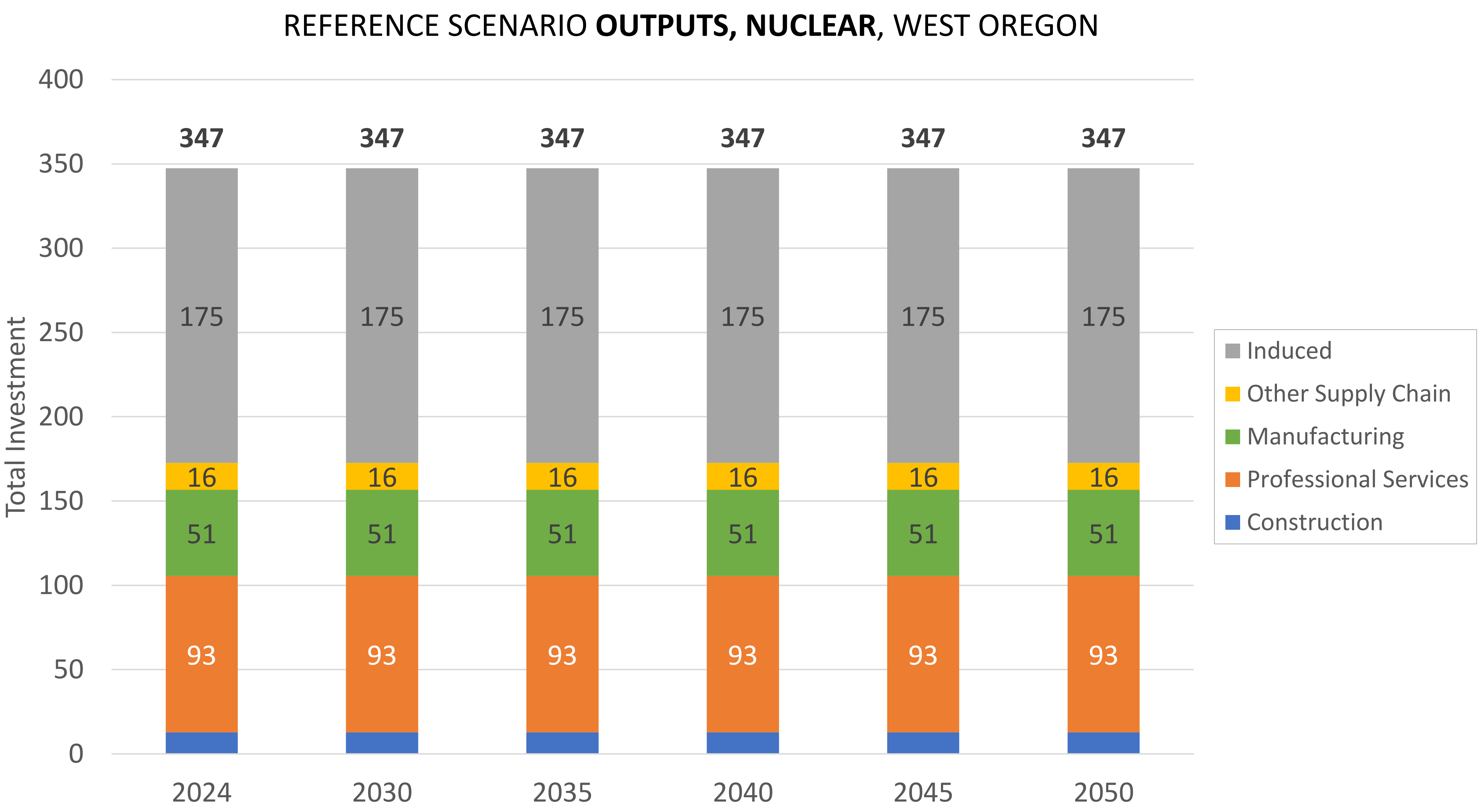
REFERENCE SCENARIO **OUTPUTS, GAS GENERATION**, WEST OREGON



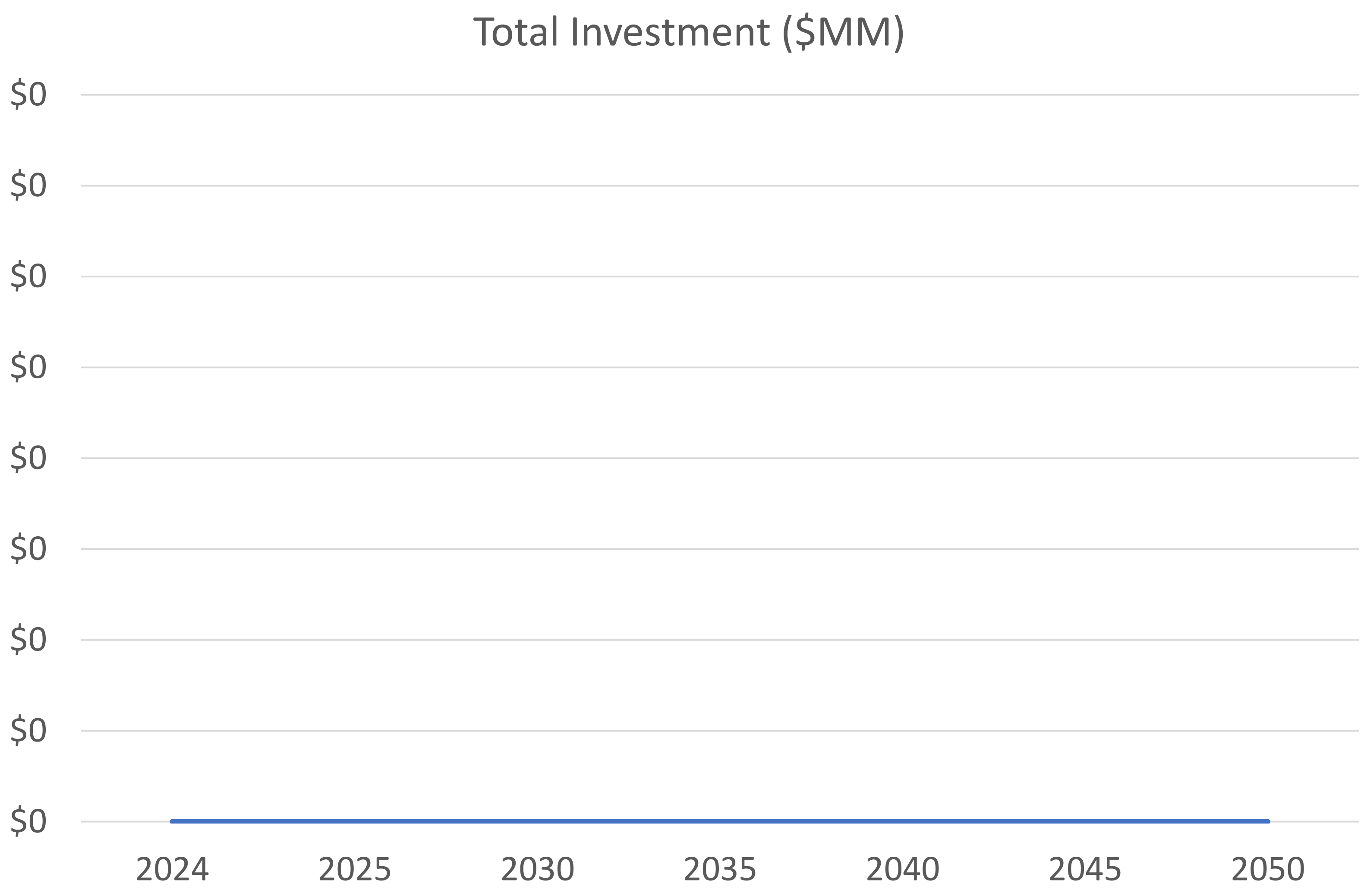
REFERENCE SCENARIO **INPUTS, NUCLEAR**, WEST OREGON



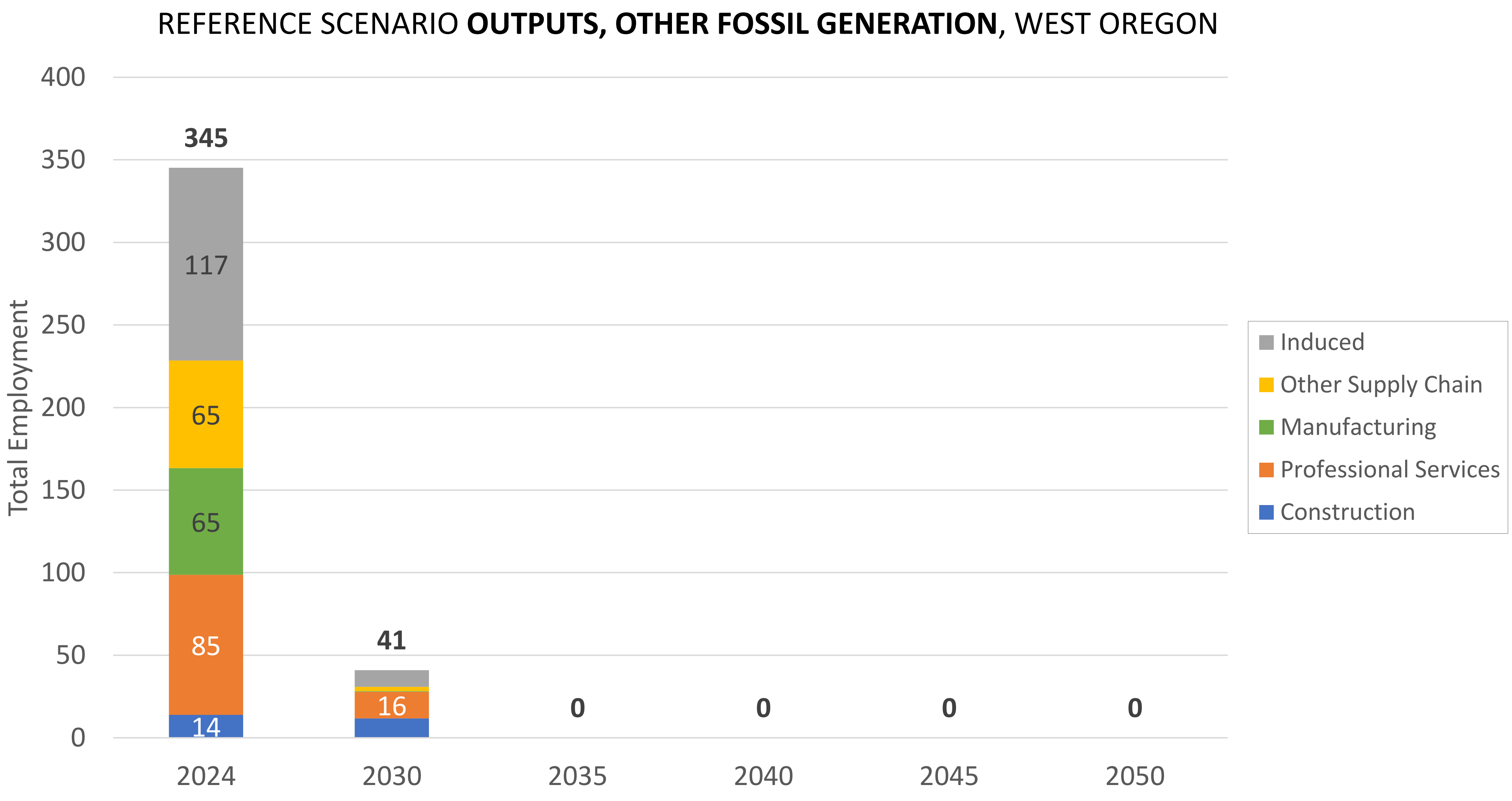
The EER model did not build nuclear generation in Oregon or any other states. Nuclear employment shows support services for existing nuclear generation in other states. These support services are assumed to stay the same throughout the study years.


REFERENCE SCENARIO **OUTPUTS, NUCLEAR**, WEST OREGON
Total Investment
400
350
300
250
200
150
100
50
0
347
175
16
51
93
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

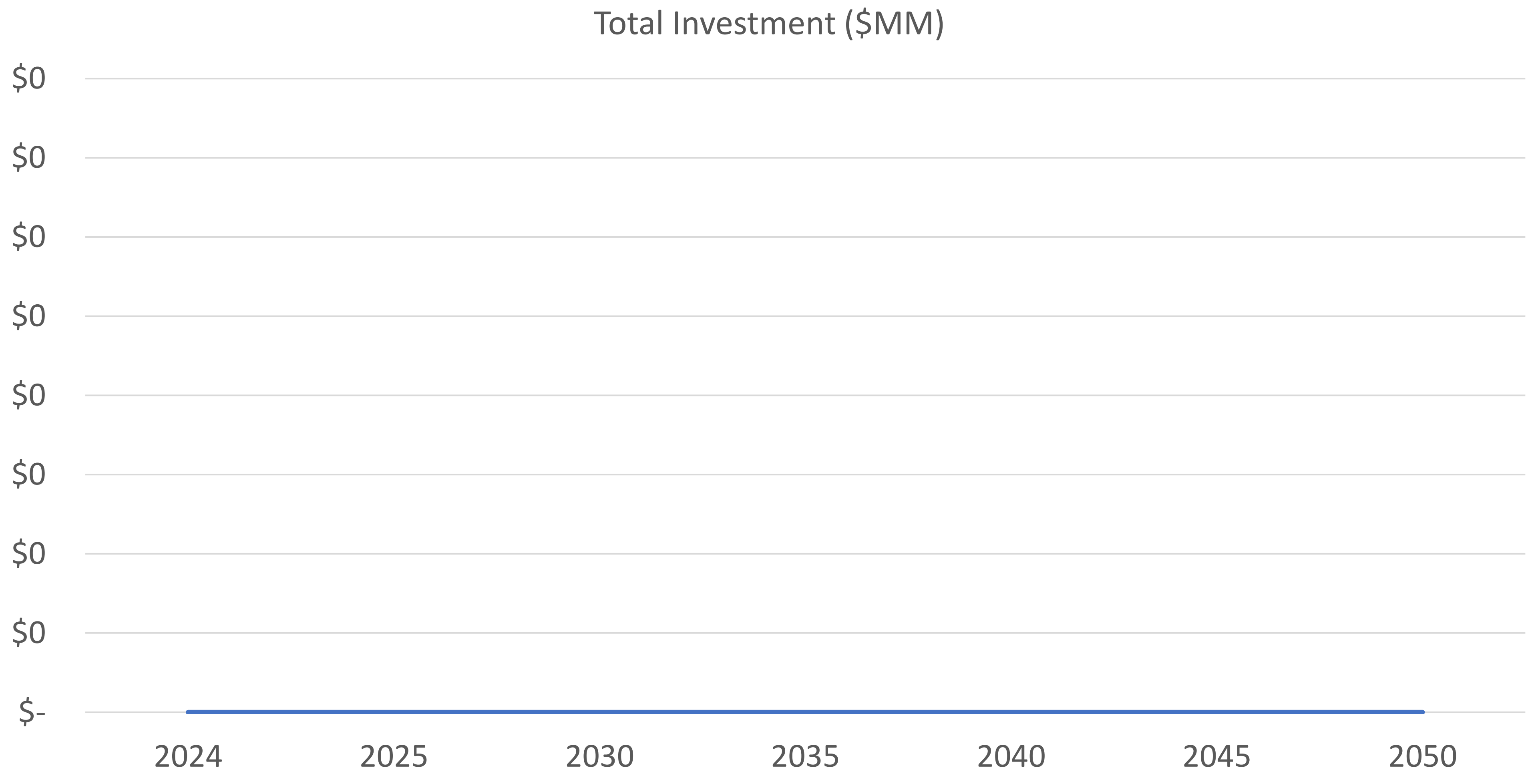
REFERENCE SCENARIO **INPUTS, OTHER FOSSIL GENERATION**, WEST OREGON



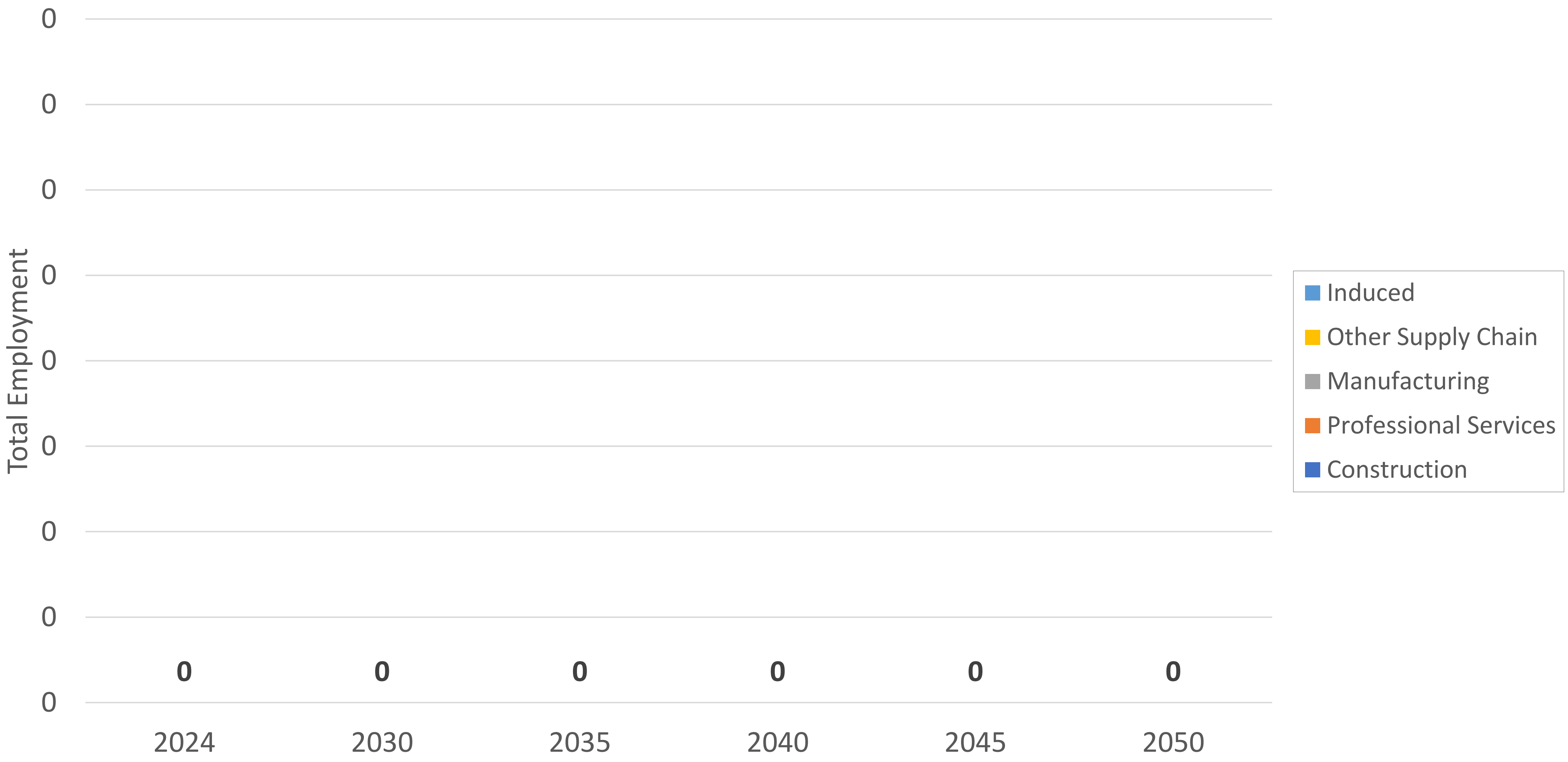
The EER model did not build petroleum or coal generation in Oregon. Other fossil generation employment shows support services for existing coal generation in neighboring states. These support services are assumed to decline with retirements throughout the study years, though there is uncertainty.


REFERENCE SCENARIO OUTPUTS, OTHER FOSSIL GENERATION, WEST OREGON
400
350
300
250
200
150
100
50
0
Total Employment
345
117
65
65
85
14
41
16
0
0
0
0
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

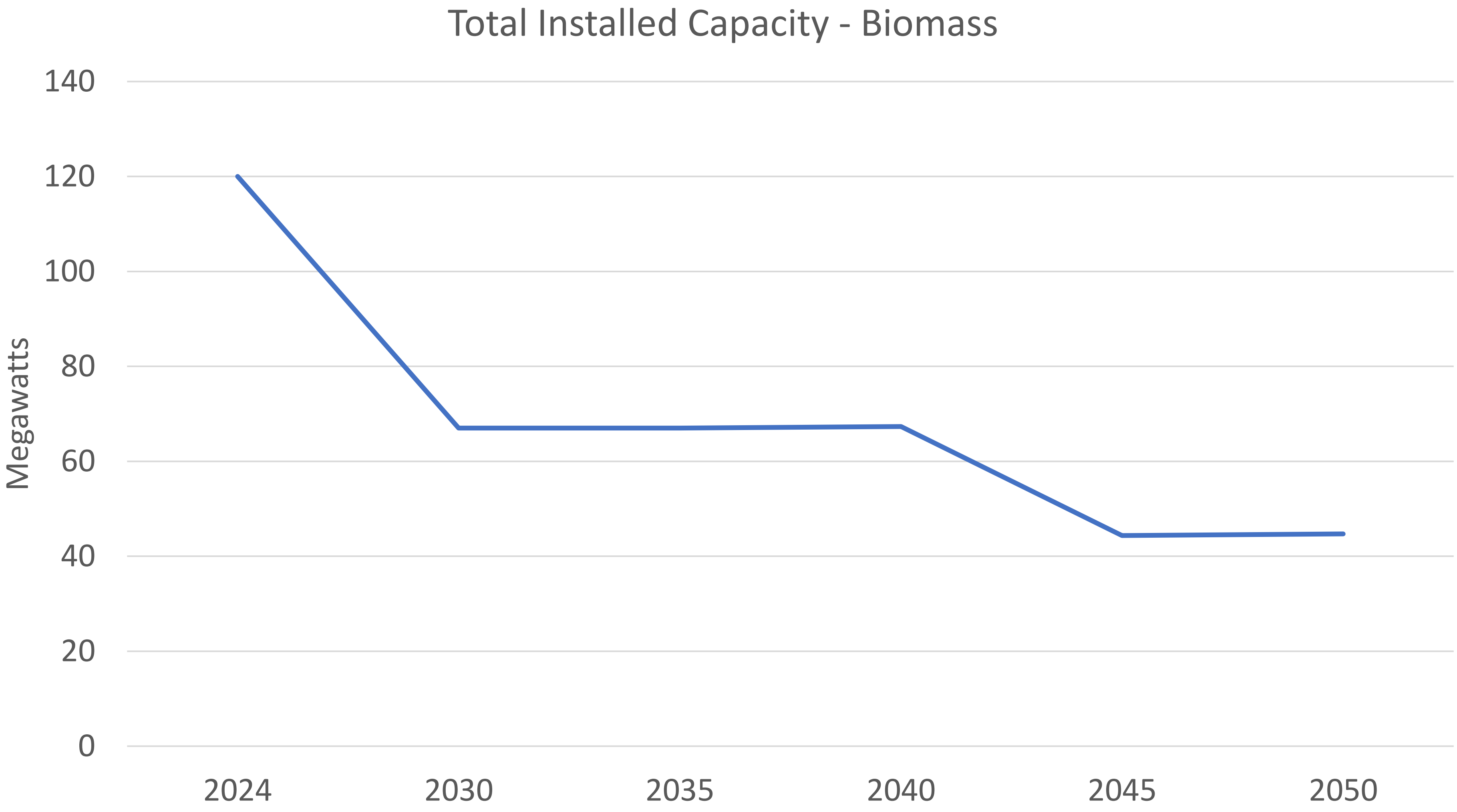
REFERENCE SCENARIO **INPUTS, OTHER RENEWABLE GENERATION - GEOTHERMAL**, WEST OREGON



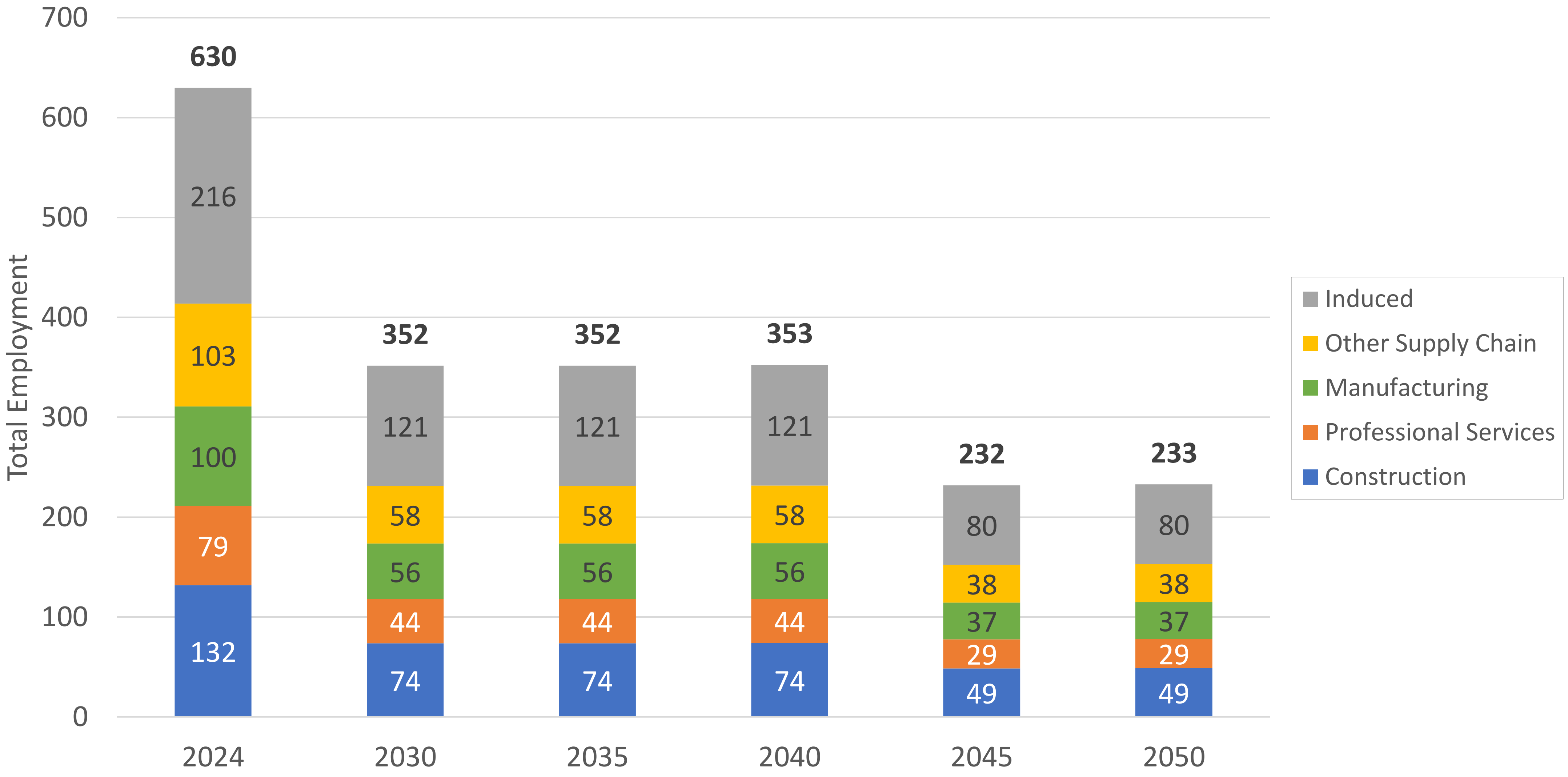
REFERENCE SCENARIO **OUTPUTS, OTHER RENEWABLE GENERATION - GEOTHERMAL**, WEST OREGON



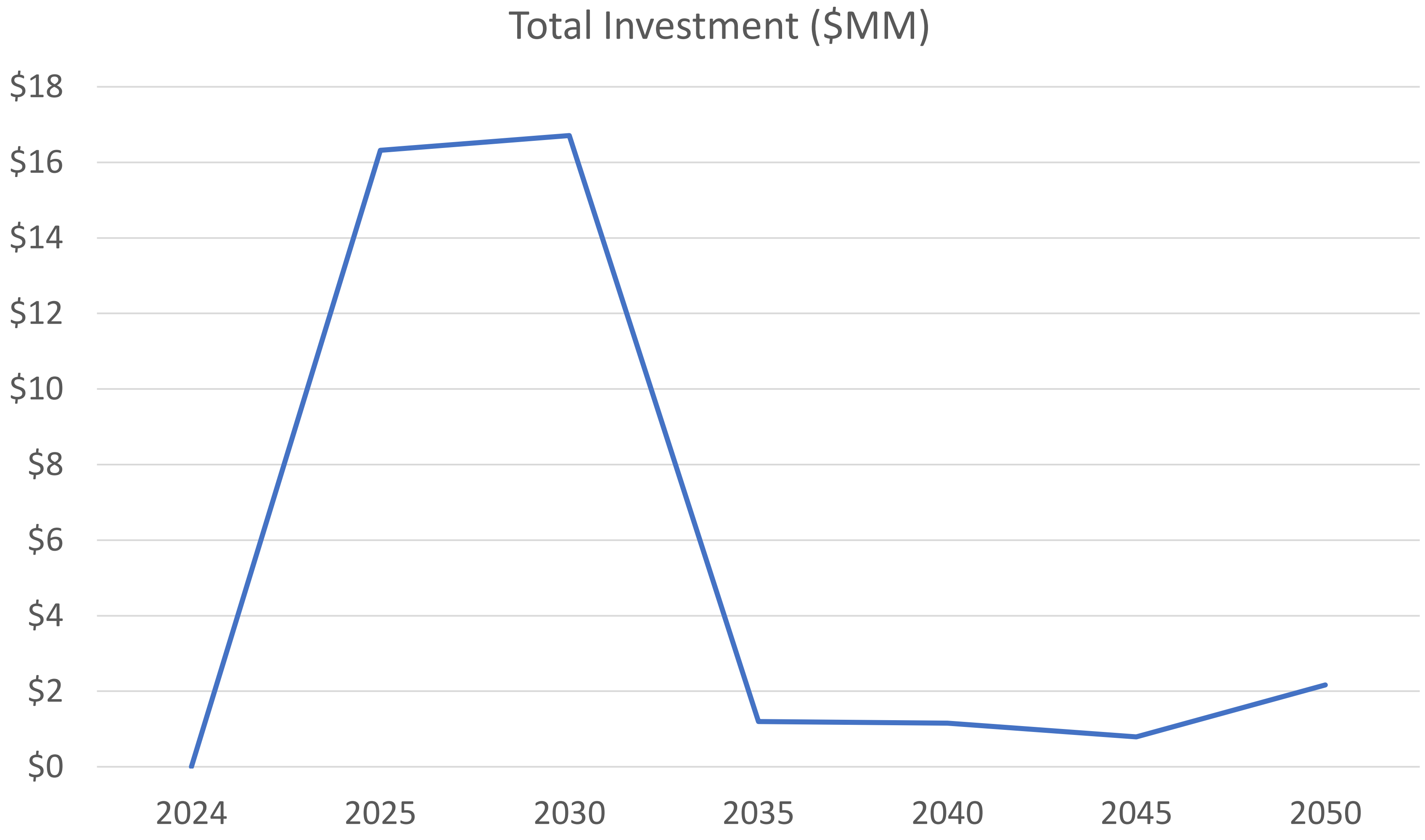
REFERENCE SCENARIO **INPUTS, OTHER RENEWABLE GENERATION - BIOMASS**, WEST OREGON



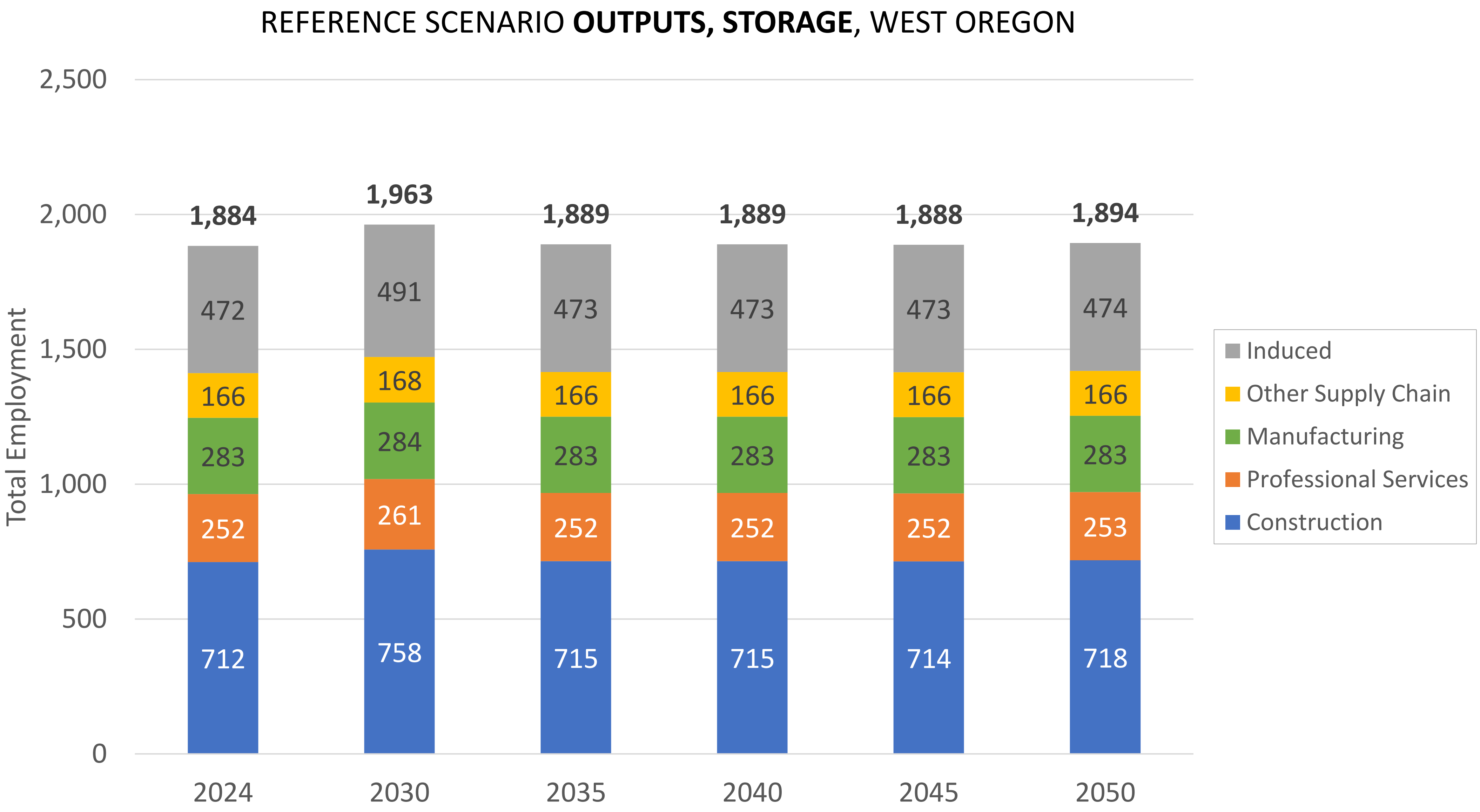
REFERENCE SCENARIO **OUTPUTS, OTHER RENEWABLE GENERATION – BIOMASS**, WEST OREGON



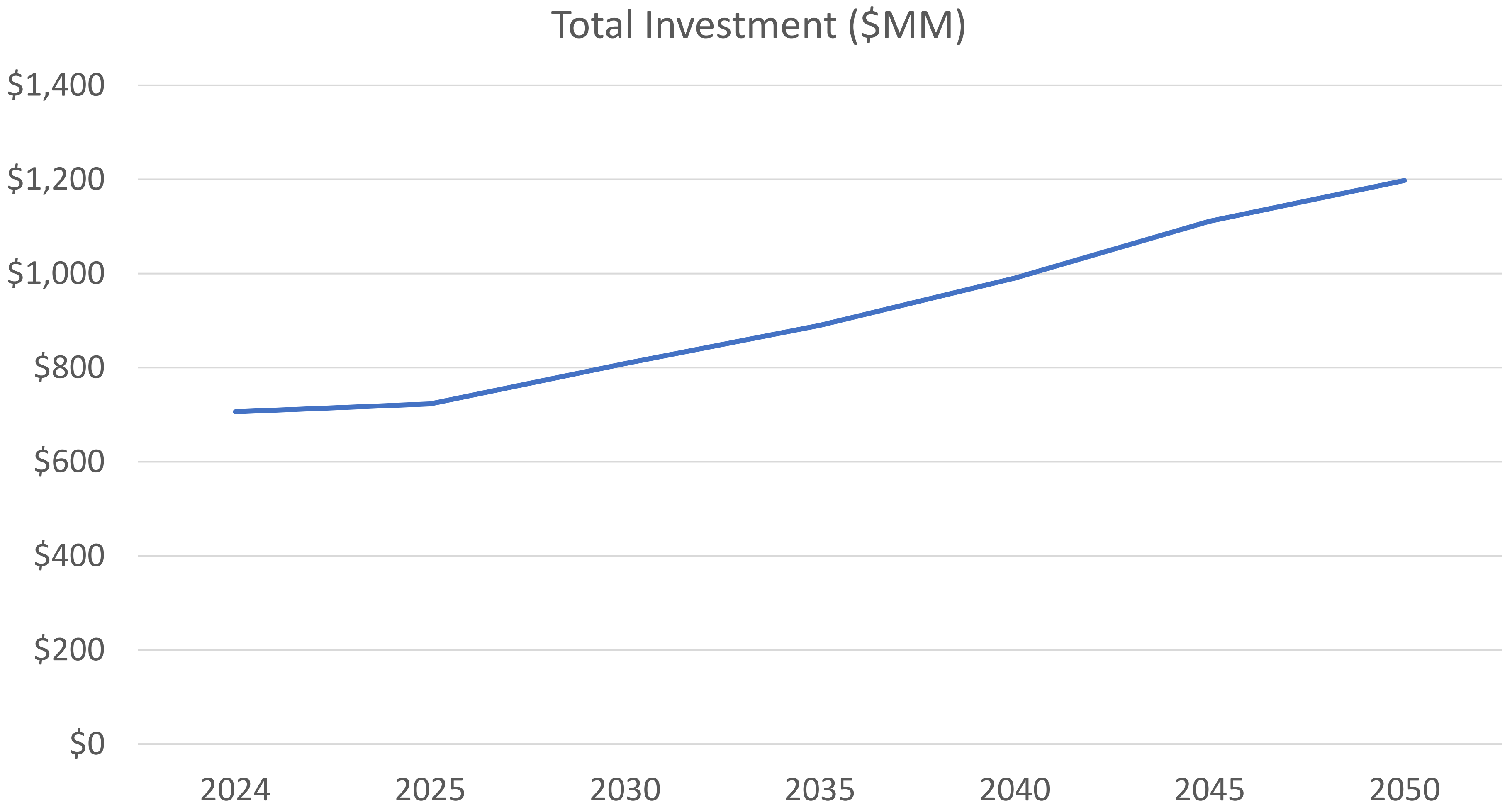
REFERENCE SCENARIO **INPUTS, STORAGE**, WEST OREGON



The investment for Storage found by the EER model is incremental to existing Storage capacity. The baseline for 2024 is shown as $0.

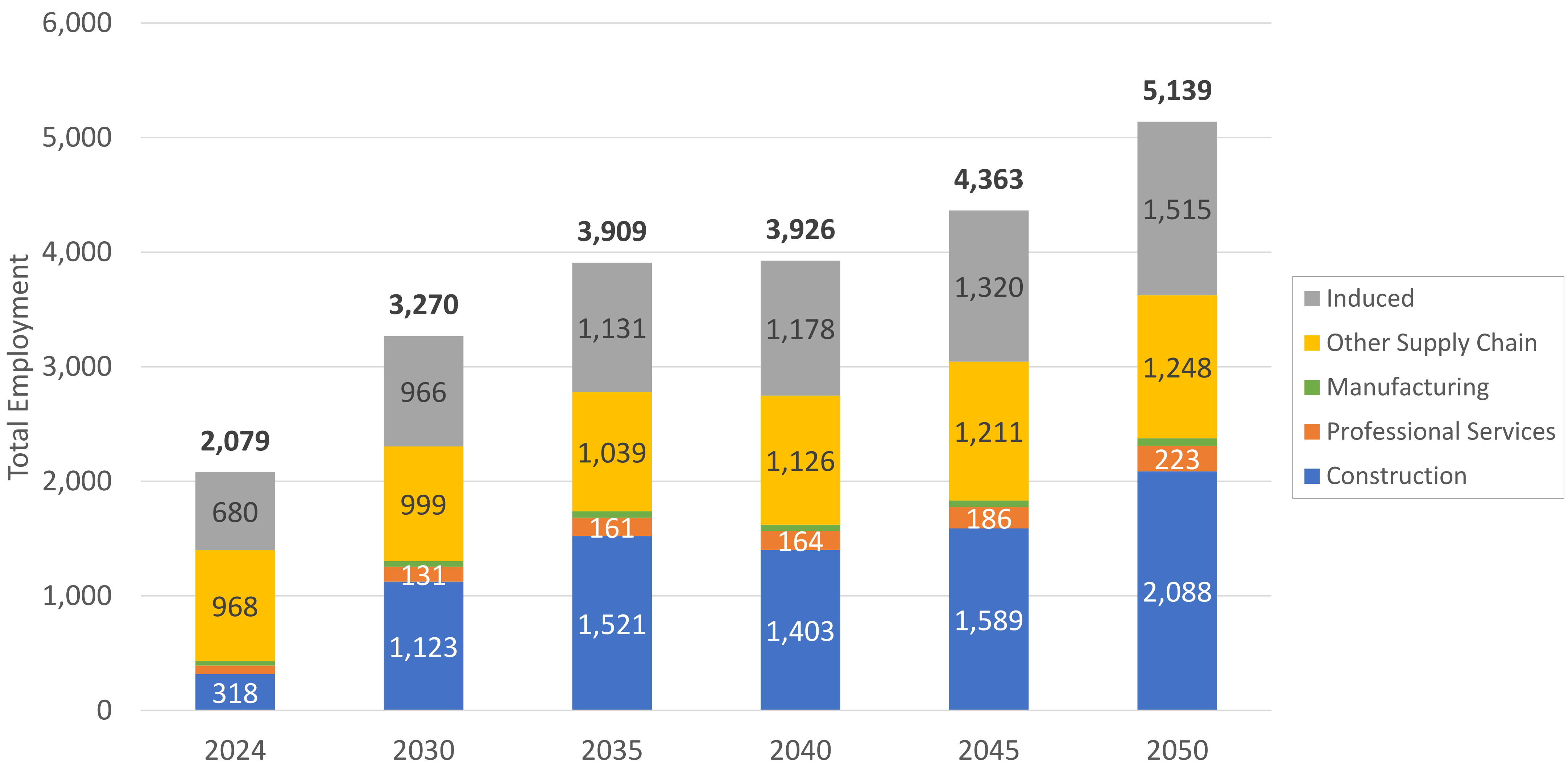

REFERENCE SCENARIO **OUTPUTS, STORAGE**, WEST OREGON
Total Employment
2,500
2,000
1,500
1,000
500
0
1,884
1,963
1,889
1,889
1,888
1,894
472
491
473
473
473
474
166
168
166
166
166
166
283
284
283
283
283
283
252
261
252
252
252
253
712
758
715
715
714
718
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS, TRANSMISSION**, WEST OREGON

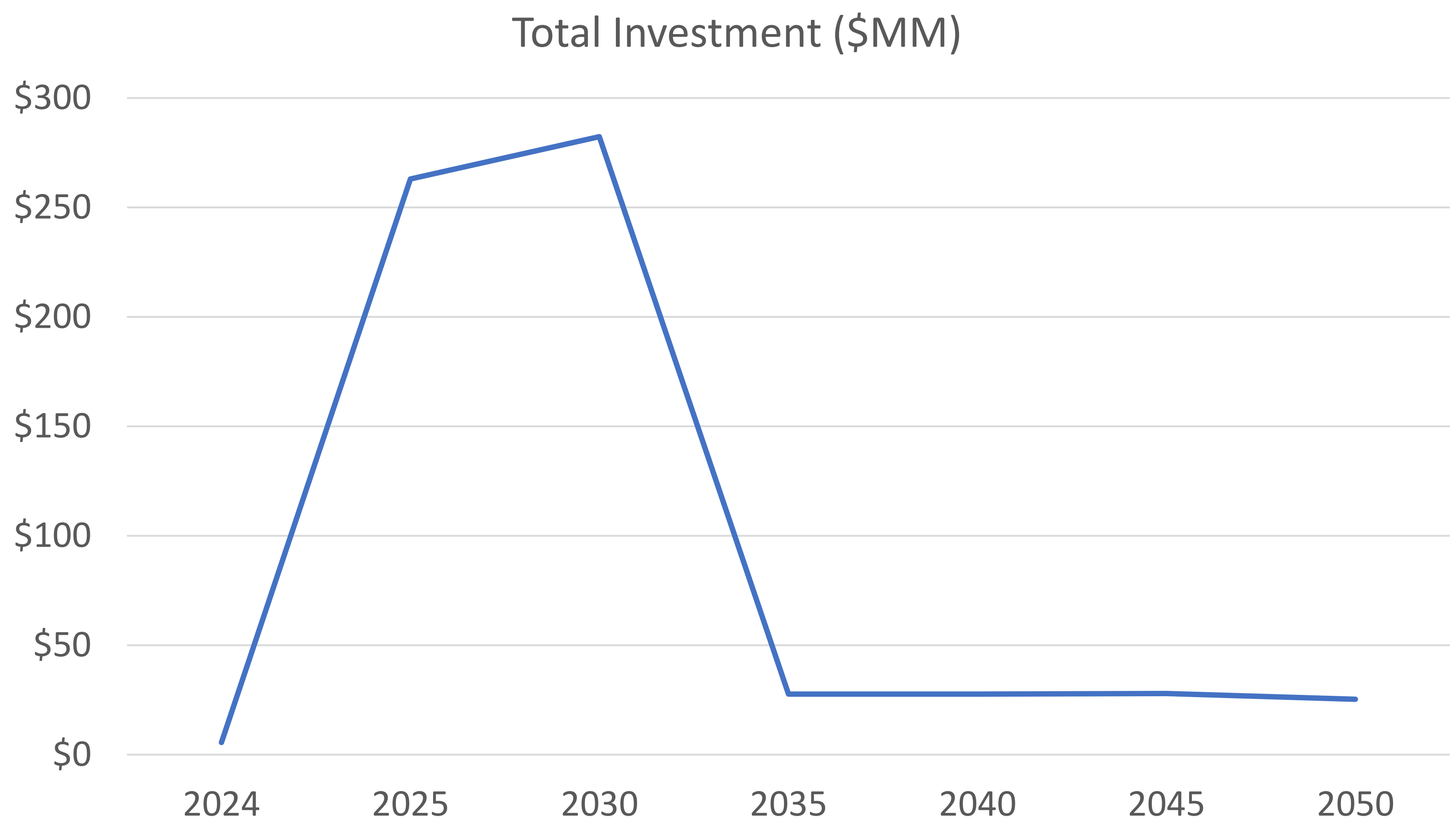


Investments include both intra- and inter-zonal transmission in West Oregon.

REFERENCE SCENARIO **OUTPUTS, TRANSMISSION**, WEST OREGON

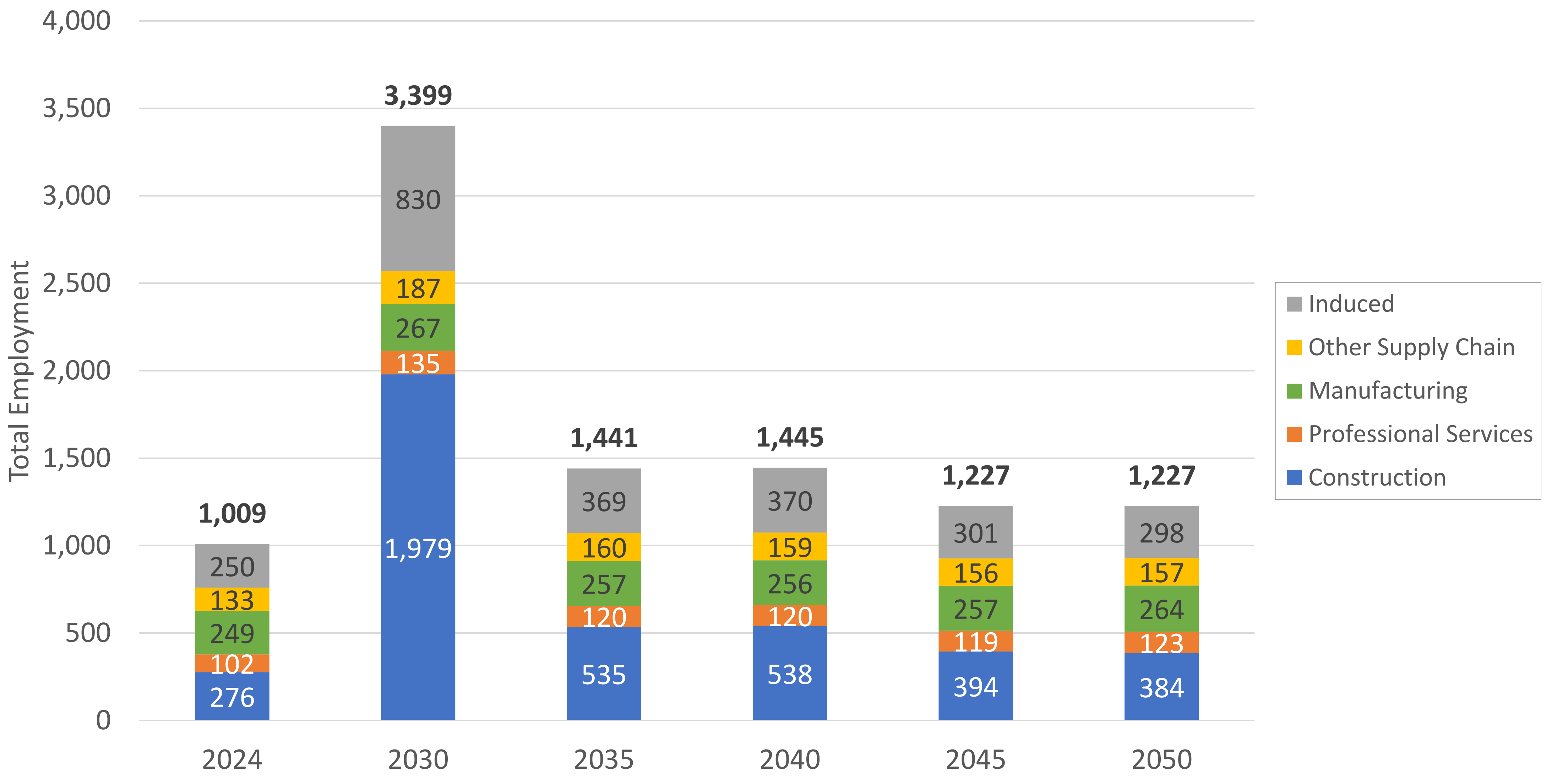


REFERENCE SCENARIO **INPUTS, UTILITY SOLAR**, WEST OREGON



Utility-scale solar investments support progress toward 2030 clean energy targets, but investment declines over time.

REFERENCE SCENARIO **OUTPUTS, UTILITY SOLAR**, WEST OREGON



Oregon Energy Strategy

Part 3: Initial Employment Outputs

Fuels

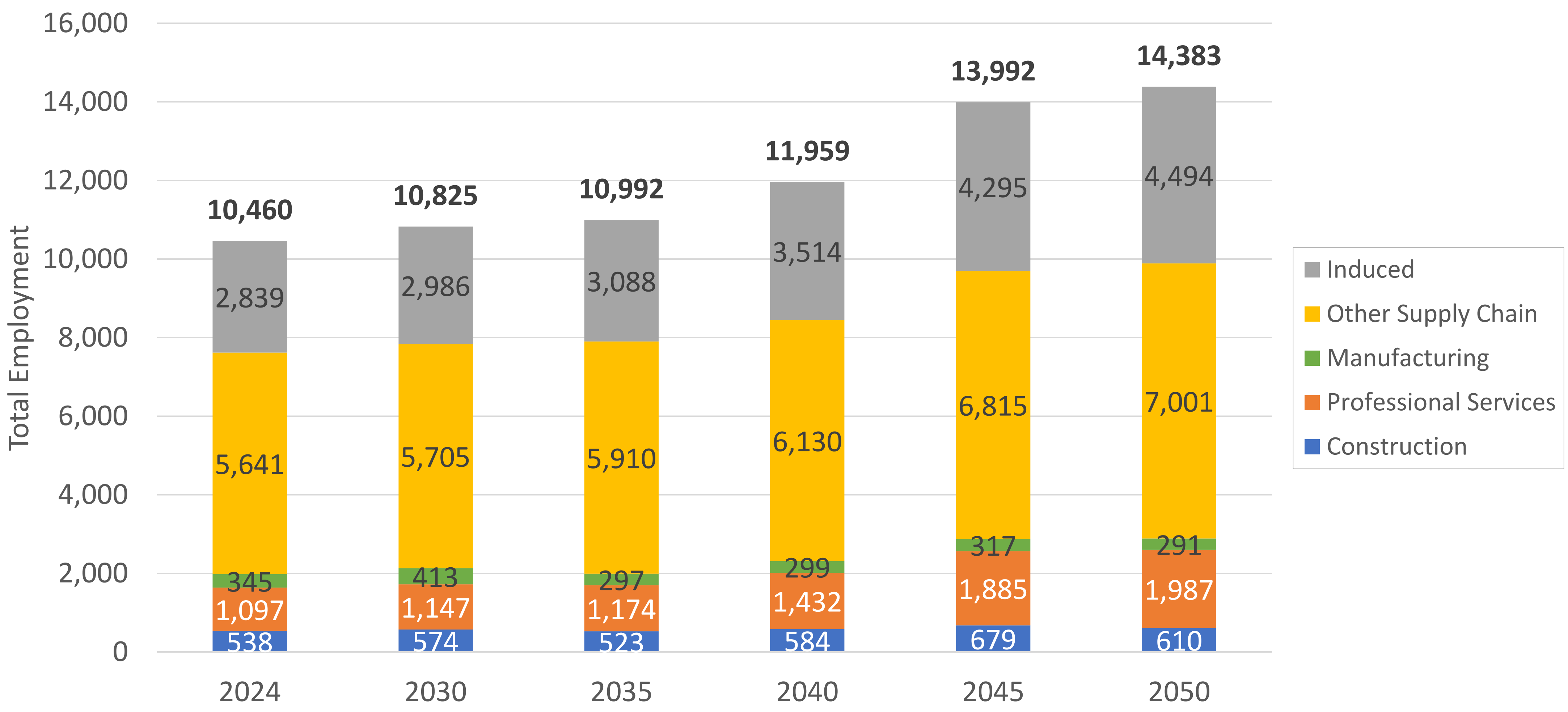
II. Fuels

1. Hydrogen
2. Biofuels
3. Natural Gas Production, Trade, and Support Services
4. Natural Gas Distribution
5. Other Fossil Fuels

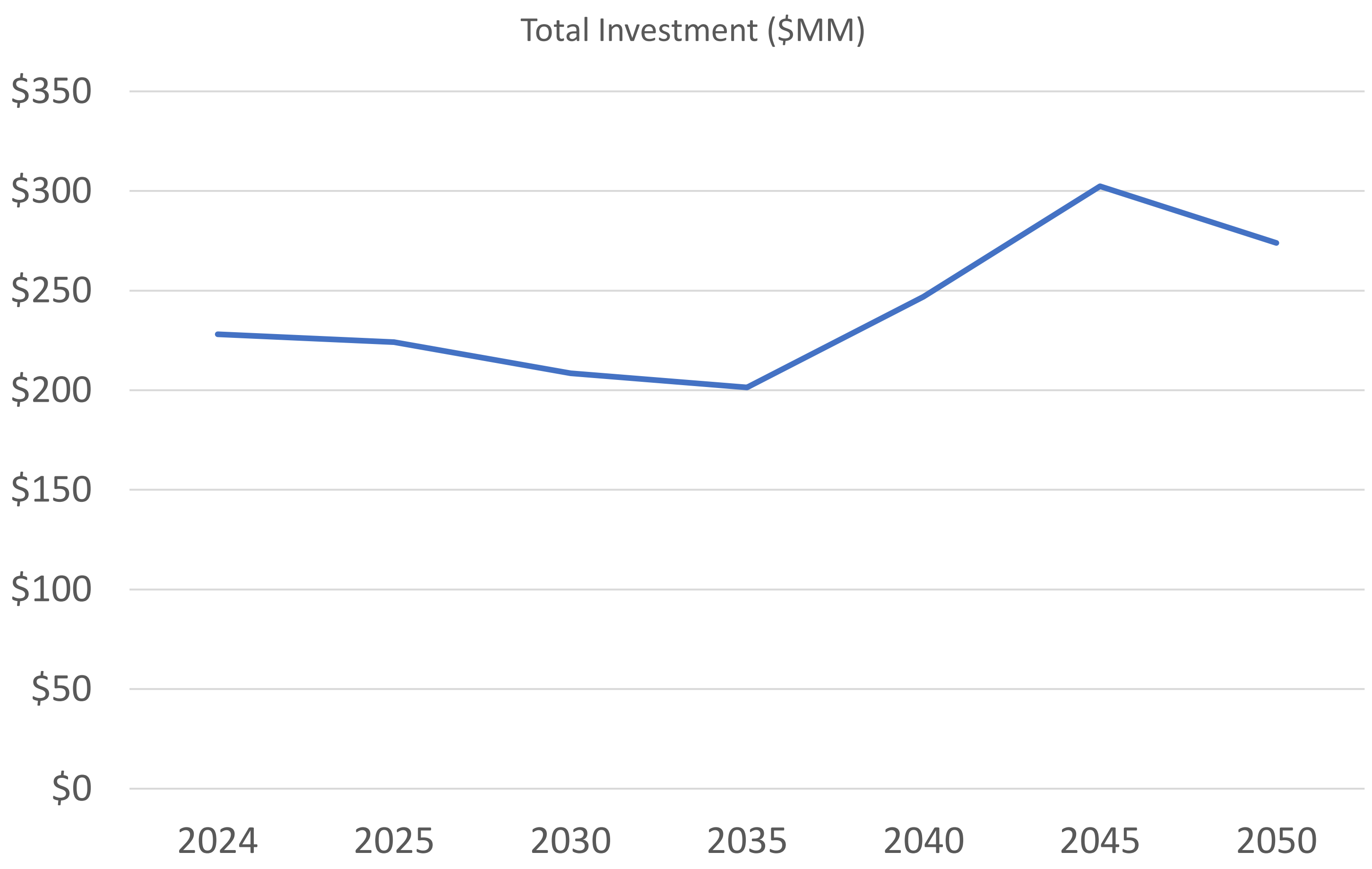
FUELS: REFERENCE, OREGON

SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Hydrogen	0	686	1,375	2,541	4,589	5,419
Sub-total	**0**	**686**	**1,375**	**2,541**	**4,589**	**5,419**
Change		**686**	**1,375**	**2,541**	**4,589**	**5,419**
Displacement Sub-Sectors						
Biofuels	6,184	6,079	6,040	6,359	6,762	6,540
Natural Gas Production, Trade, and Support Services	307	242	167	140	109	93
Natural Gas Distribution	3,197	3,094	2,904	2,630	2,379	2,242
Other Fossil Fuels	772	724	505	289	153	87
Sub-total	**10,460**	**10,139**	**9,617**	**9,417**	**9,403**	**8,963**
Change		**-321**	**-843**	**-1,043**	**-1,058**	**-1,497**
Fuels OVERALL	**10,460**	**10,825**	**10,992**	**11,959**	**13,992**	**14,383**
Net Change from 2024		**365**	**532**	**1,499**	**3,531**	**3,922**

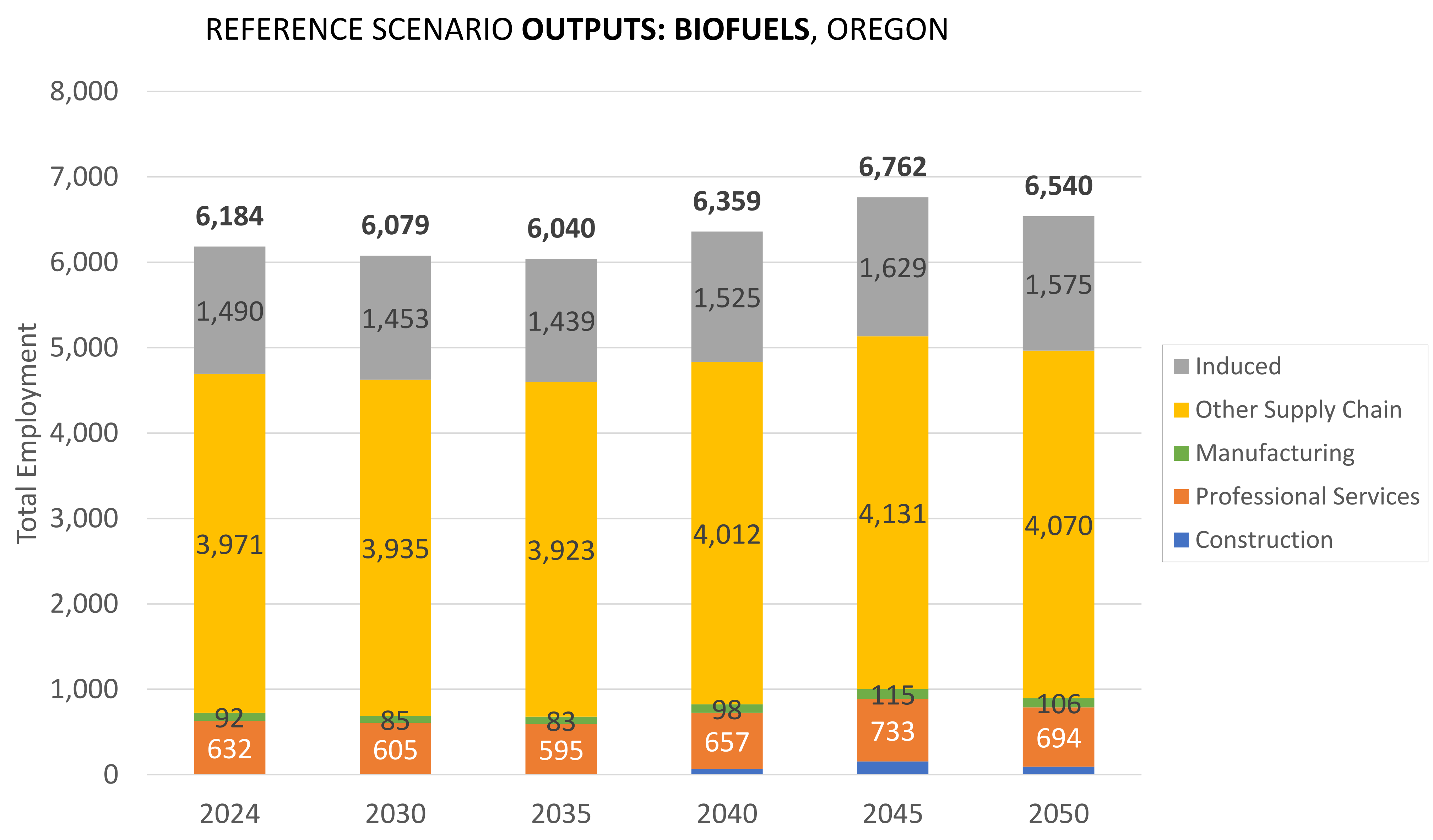
REFERENCE SCENARIO: **FUELS – TOTALS**, OREGON



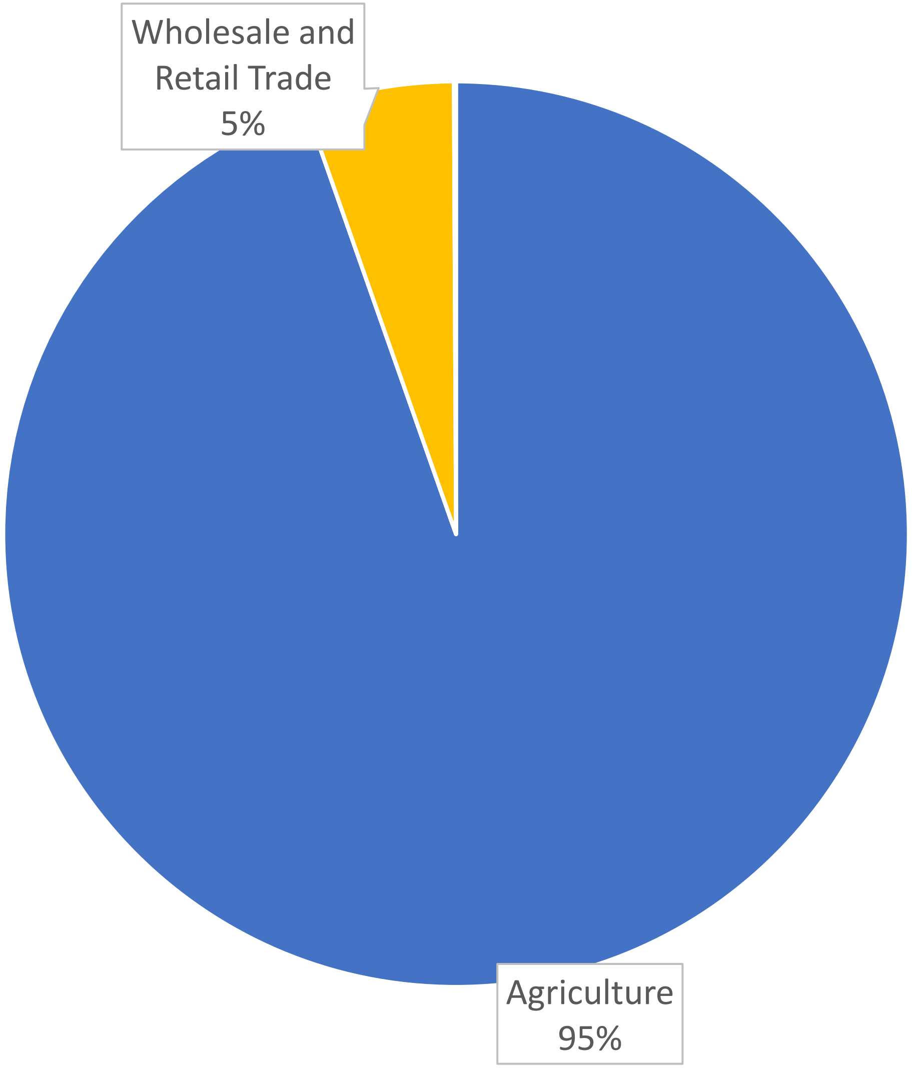
REFERENCE SCENARIO **INPUTS: BIOFUELS**, OREGON



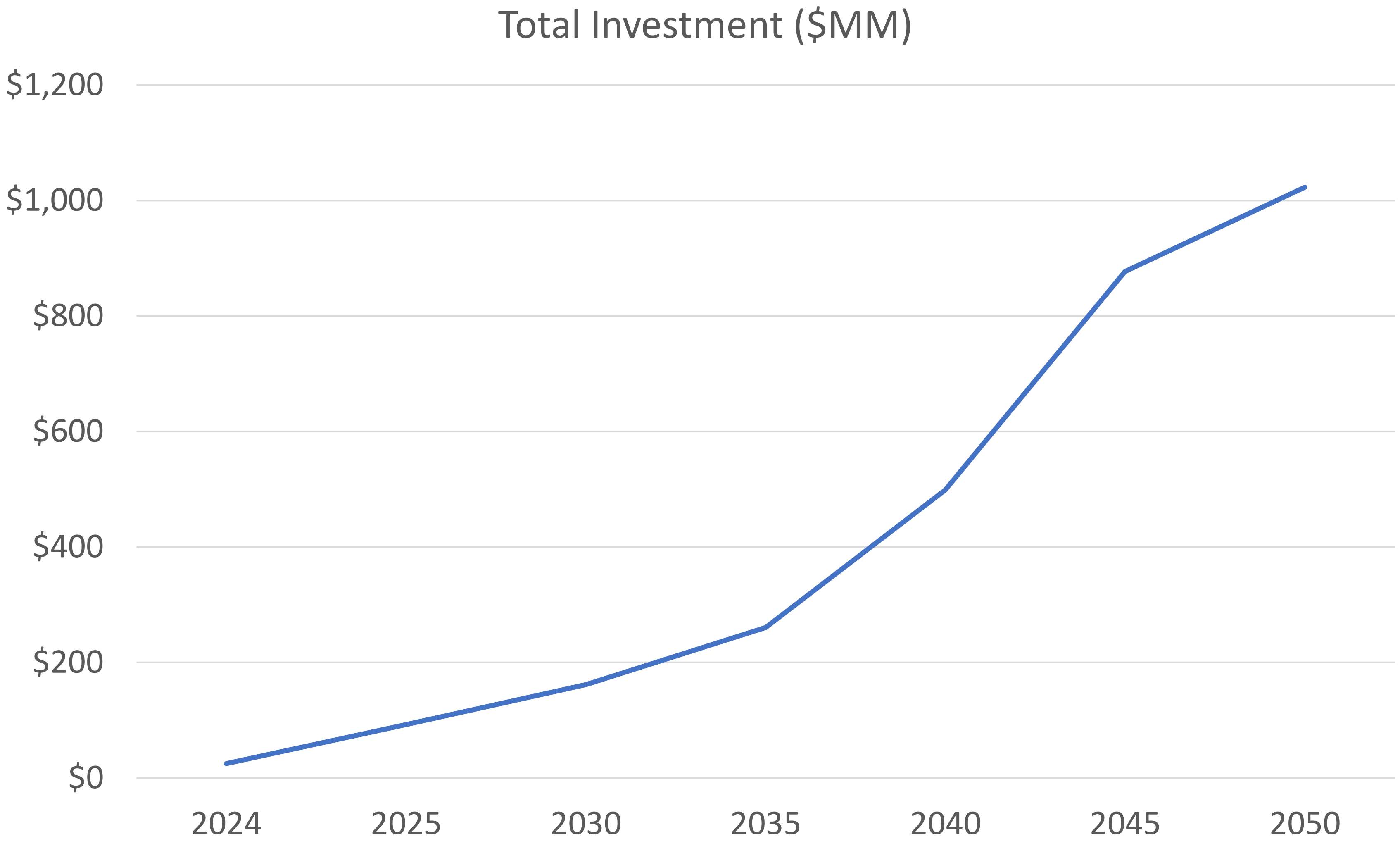
Investments in biofuel production and distribution decline due to ongoing electrification of buildings and the vehicle fleet, then recover in later years.

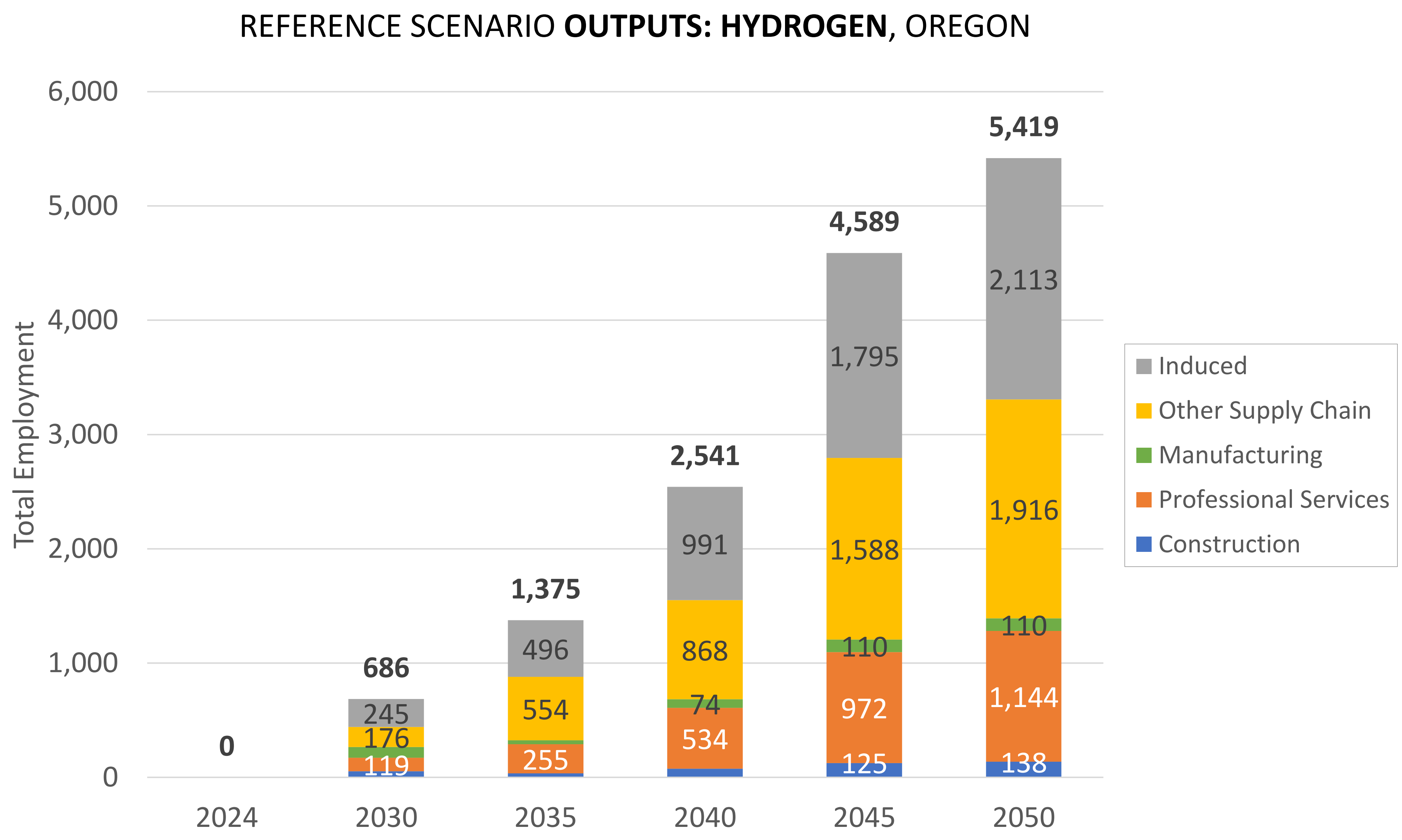

REFERENCE SCENARIO OUTPUTS: BIOFUELS, OREGON
Total Employment
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
6,184
6,079
6,040
6,359
6,762
6,540
1,490
1,453
1,439
1,525
1,629
1,575
3,971
3,935
3,923
4,012
4,131
4,070
92
85
83
98
115
106
632
605
595
657
733
694
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

OTHER SUPPLY CHAIN BREAKOUT, **BIOFUELS**, OREGON

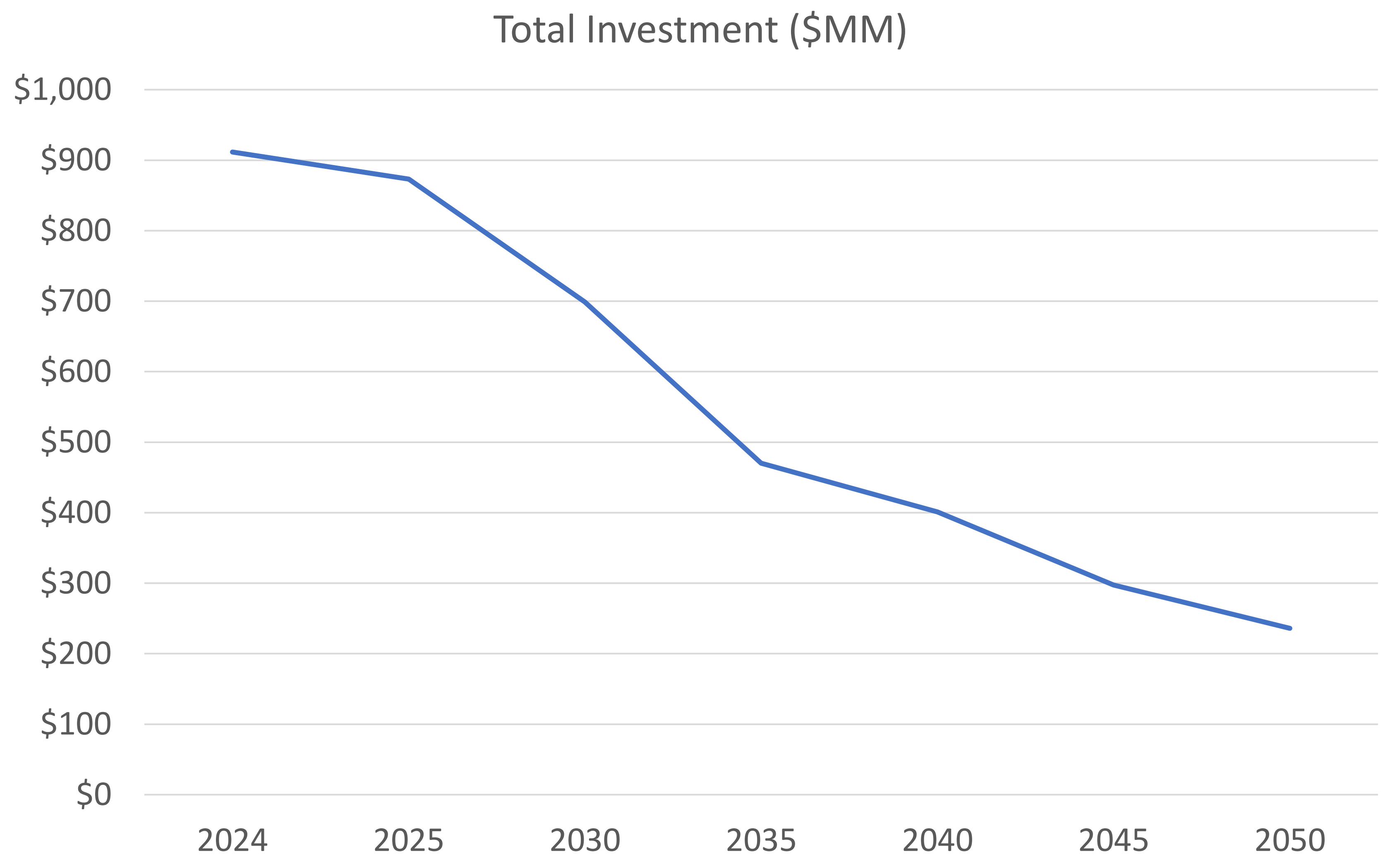


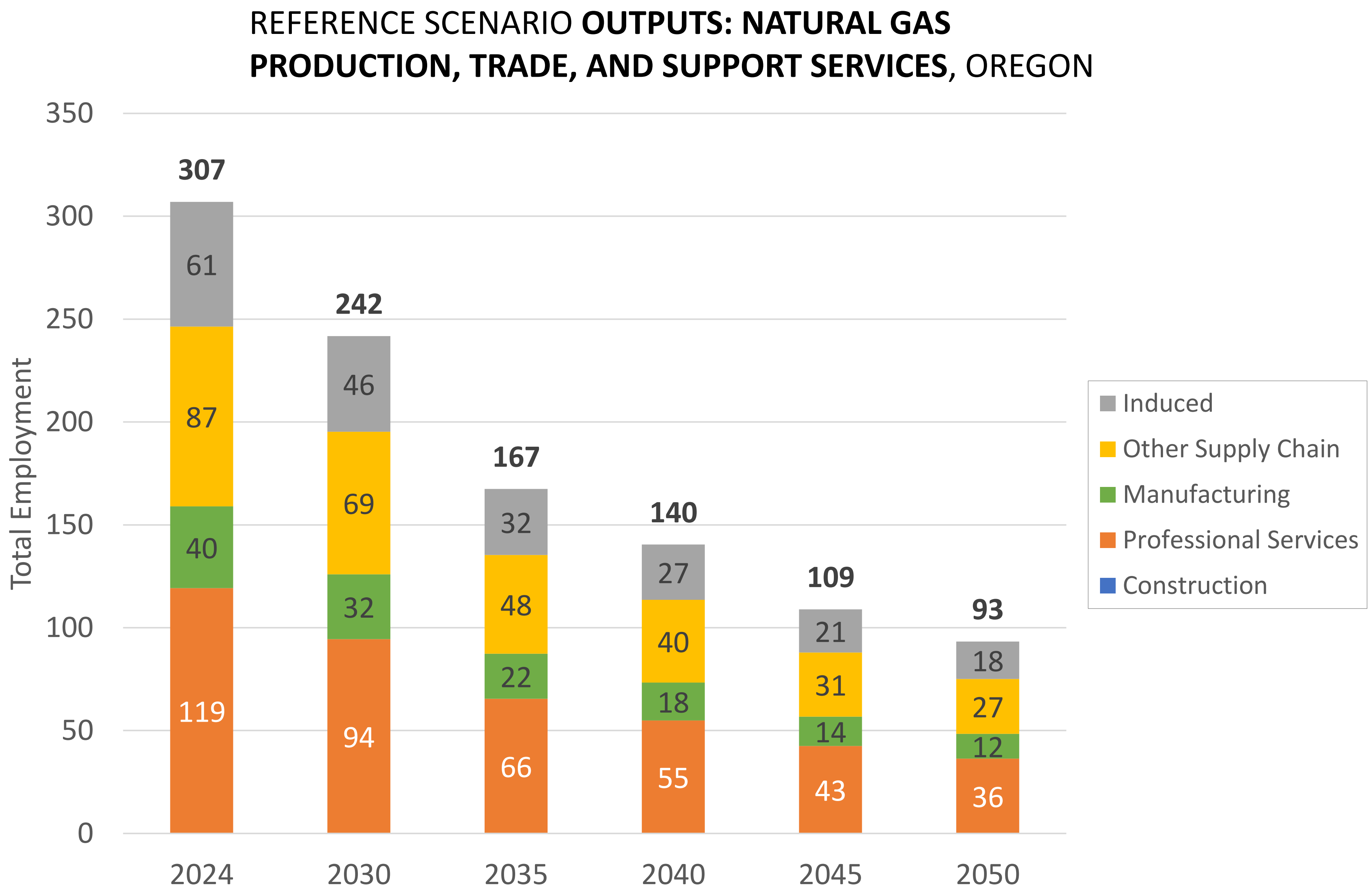
REFERENCE SCENARIO **INPUTS: HYDROGEN**, OREGON



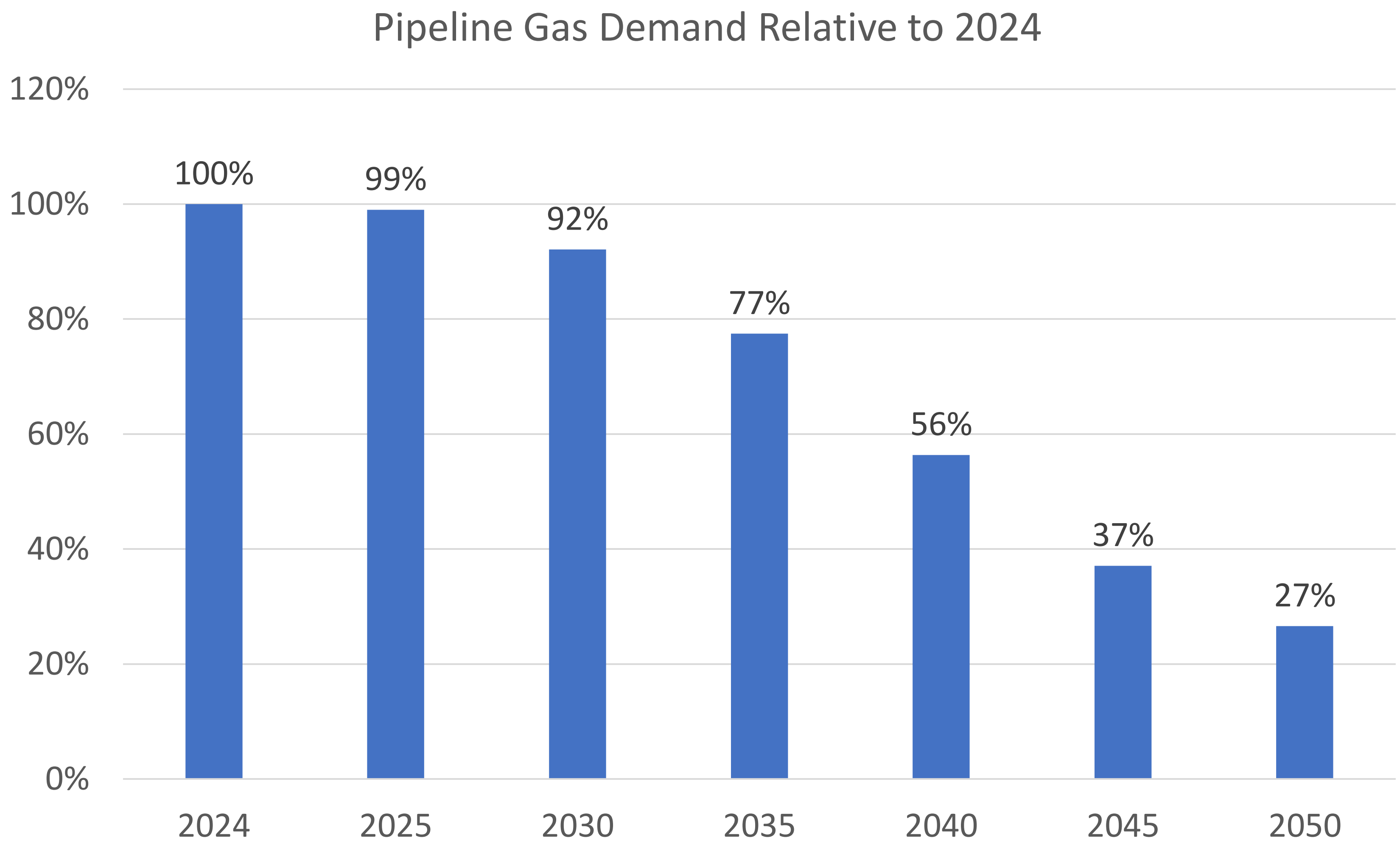

REFERENCE SCENARIO **OUTPUTS: HYDROGEN**, OREGON
Total Employment
6,000
5,000
4,000
3,000
2,000
1,000
0
2024
2030
2035
2040
2045
2050
0
686
245
176
119
1,375
496
554
255
2,541
991
868
74
534
4,589
1,795
1,588
110
972
125
5,419
2,113
1,916
110
1,144
138
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: NATURAL GAS PRODUCTION, TRADE, AND SUPPORT SERVICES**, OREGON

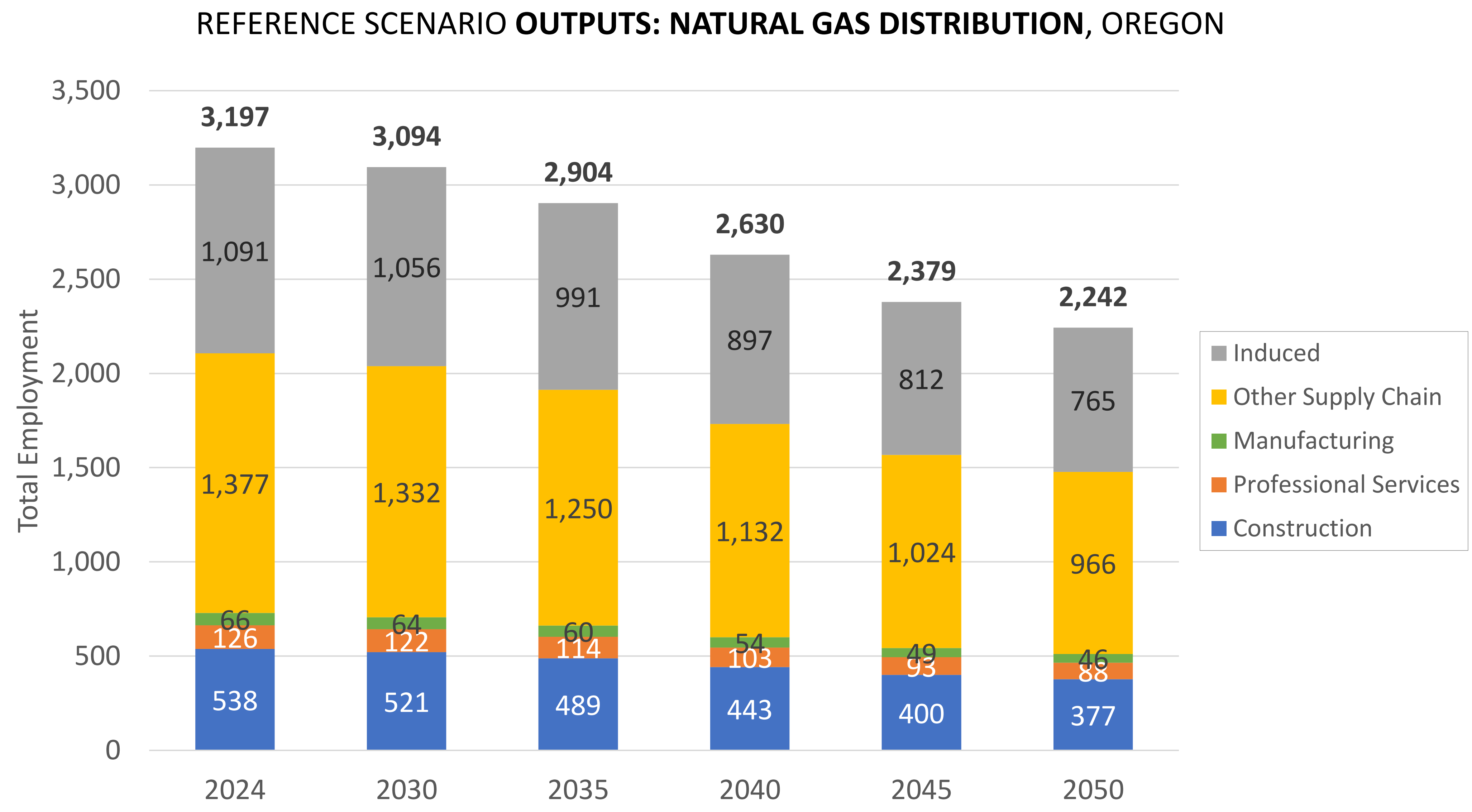



REFERENCE SCENARIO **OUTPUTS: NATURAL GAS PRODUCTION, TRADE, AND SUPPORT SERVICES**, OREGON
Total Employment
350
300
250
200
150
100
50
0
2024
2030
2035
2040
2045
2050
307
61
87
40
119
242
46
69
32
94
167
32
48
22
66
140
27
40
18
55
109
21
31
14
43
93
18
27
12
36
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

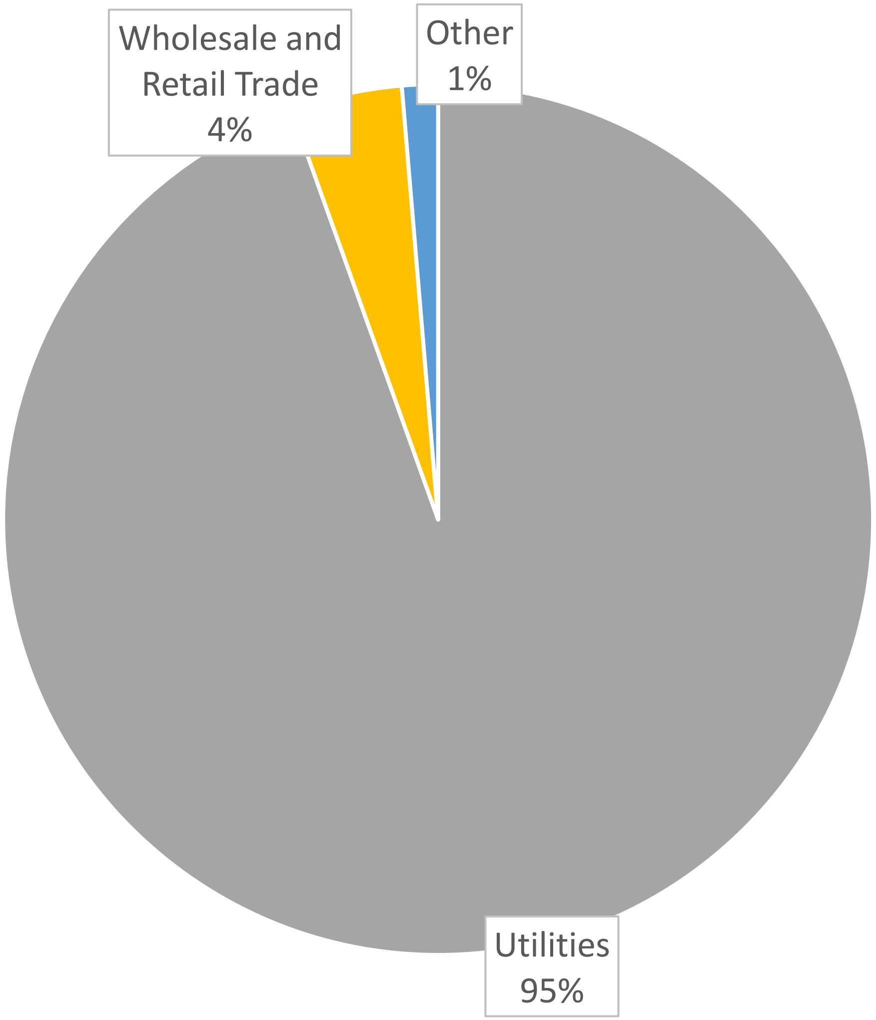
REFERENCE SCENARIO **INPUTS: NATURAL GAS DISTRIBUTION**, OREGON



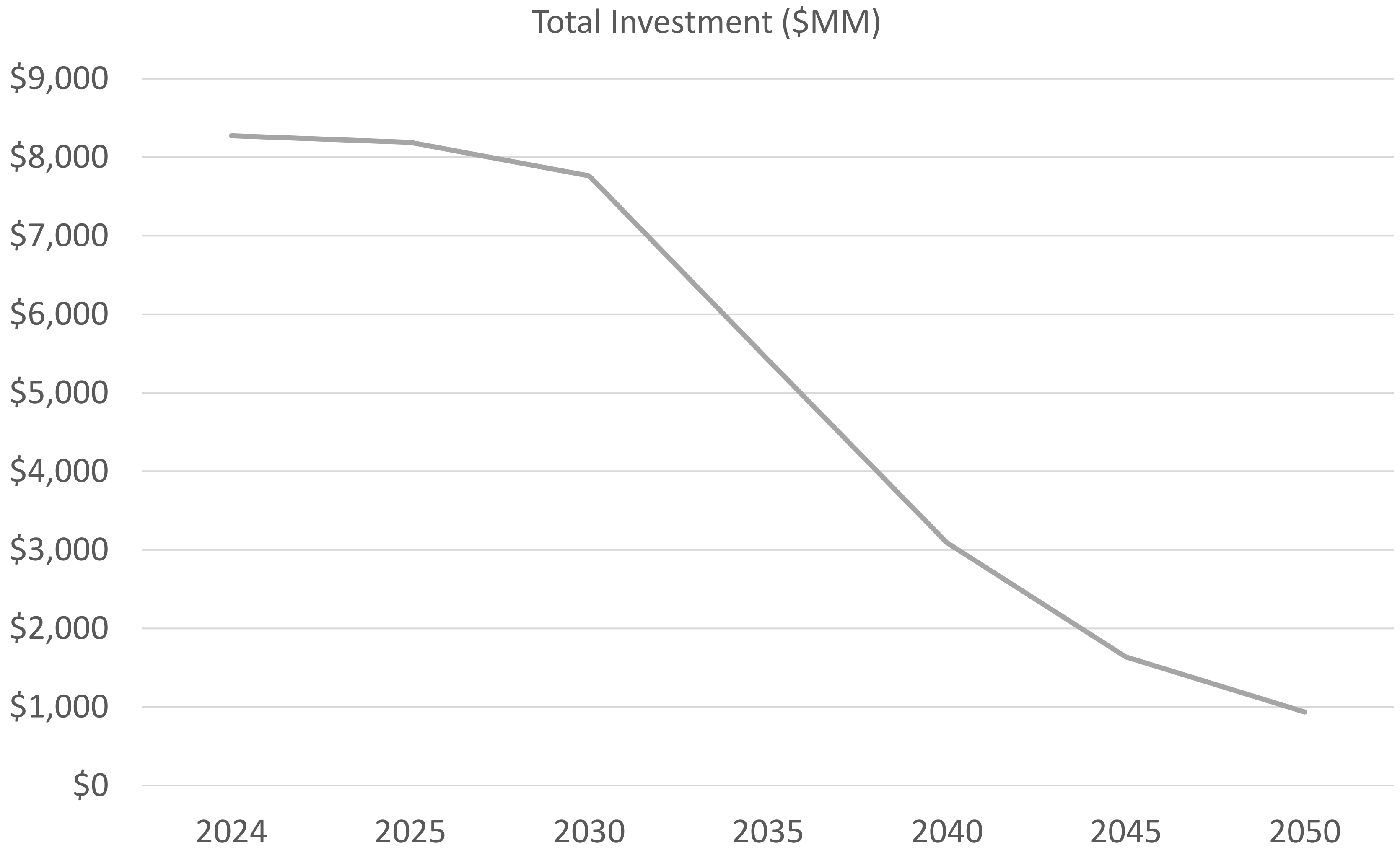
BWR uses pipeline gas demand derived from EER modeling to determine customer base, which serves as the input to the employment model.

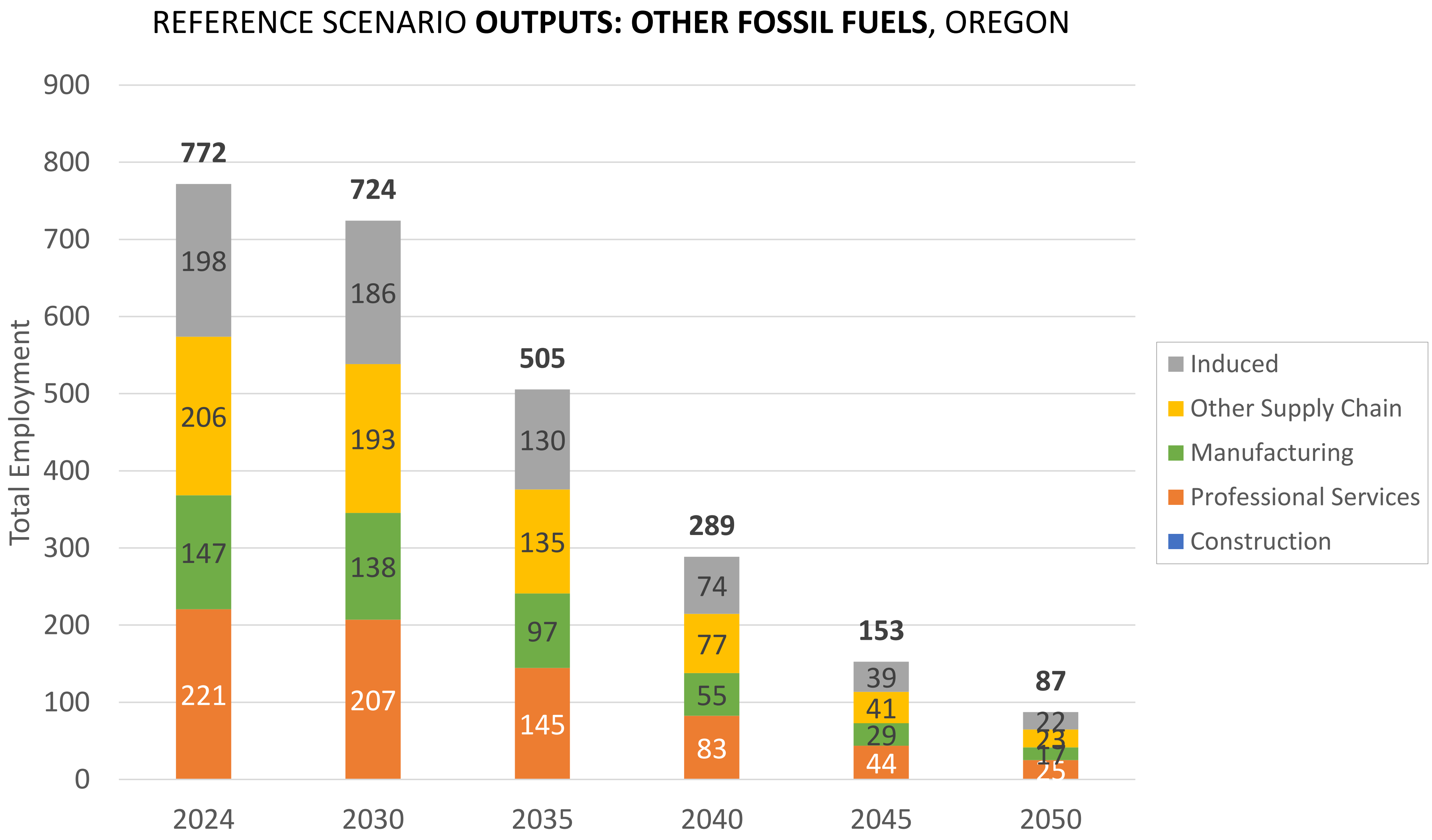

REFERENCE SCENARIO OUTPUTS: NATURAL GAS DISTRIBUTION, OREGON
Total Employment
3,500
3,000
2,500
2,000
1,500
1,000
500
0
3,197
3,094
2,904
2,630
2,379
2,242
1,091
1,056
991
897
812
765
1,377
1,332
1,250
1,132
1,024
966
66
64
60
54
49
46
126
122
114
103
93
88
538
521
489
443
400
377
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

OTHER SUPPLY CHAIN BREAKOUT**: NATURAL GAS DISTRIBUTION**, OREGON



REFERENCE SCENARIO **INPUTS: OTHER FOSSIL FUELS**, OREGON



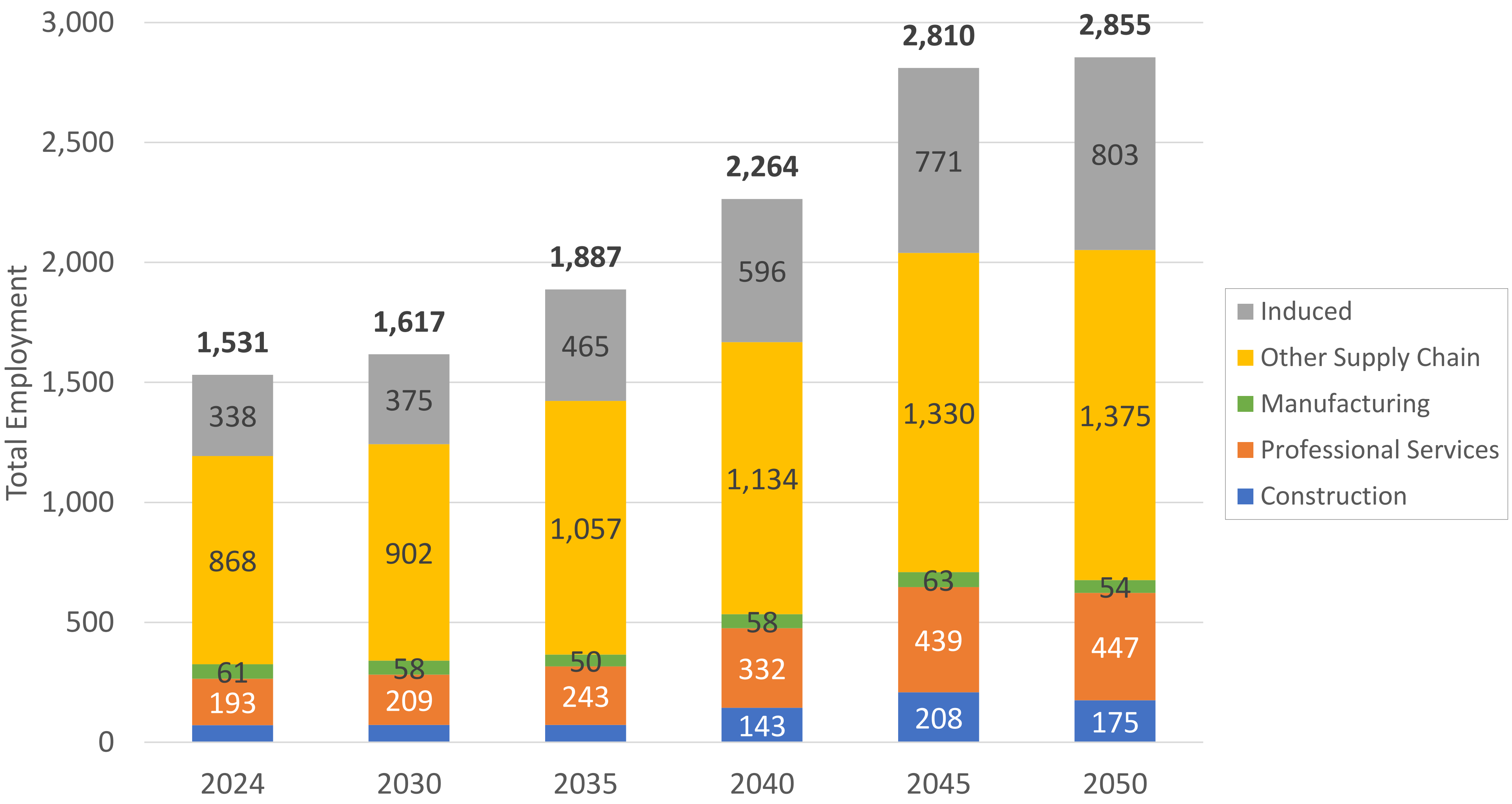

REFERENCE SCENARIO **OUTPUTS: OTHER FOSSIL FUELS**, OREGON
Total Employment
900
800
700
600
500
400
300
200
100
0
772
198
206
147
221
724
186
193
138
207
505
130
135
97
145
289
74
77
55
83
153
39
41
29
44
87
22
23
17
25
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

FUELS: REFERENCE, EAST OREGON*

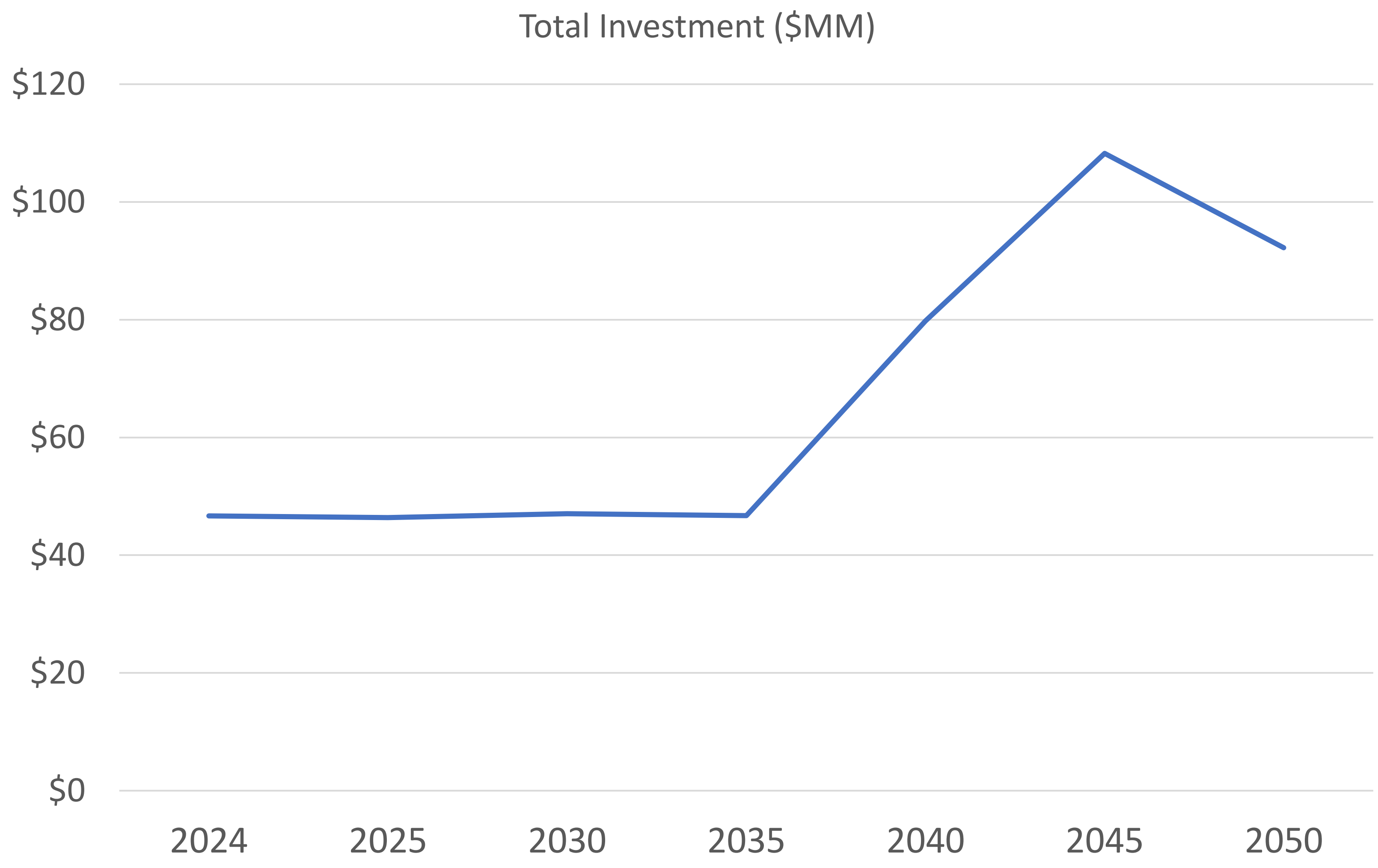
SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Hydrogen	0	117	456	656	1,042	1,232
Biofuels	1,074	1,076	1,074	1,313	1,526	1,409
Sub-total	**1,074**	**1,193**	**1,530**	**1,969**	**2,568**	**2,641**
Change		**120**	**456**	**895**	**1,494**	**1,567**
Displacement Sub-Sectors						
Natural Gas Production, Trade, and Support Services	53	38	23	21	14	9
Natural Gas Distribution	268	258	241	218	198	186
Other Fossil Fuels	136	128	93	57	31	20
Sub-total	**458**	**424**	**357**	**295**	**243**	**214**
Change		**-34**	**-100**	**-162**	**-215**	**-243**
Fuels OVERALL	**1,531**	**1,617**	**1,887**	**2,264**	**2,810**	**2,855**
Net Change from 2024		**86**	**356**	**733**	**1,279**	**1,324**

Note: **EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

REFERENCE SCENARIO: **FUELS – TOTALS**, EAST OREGON

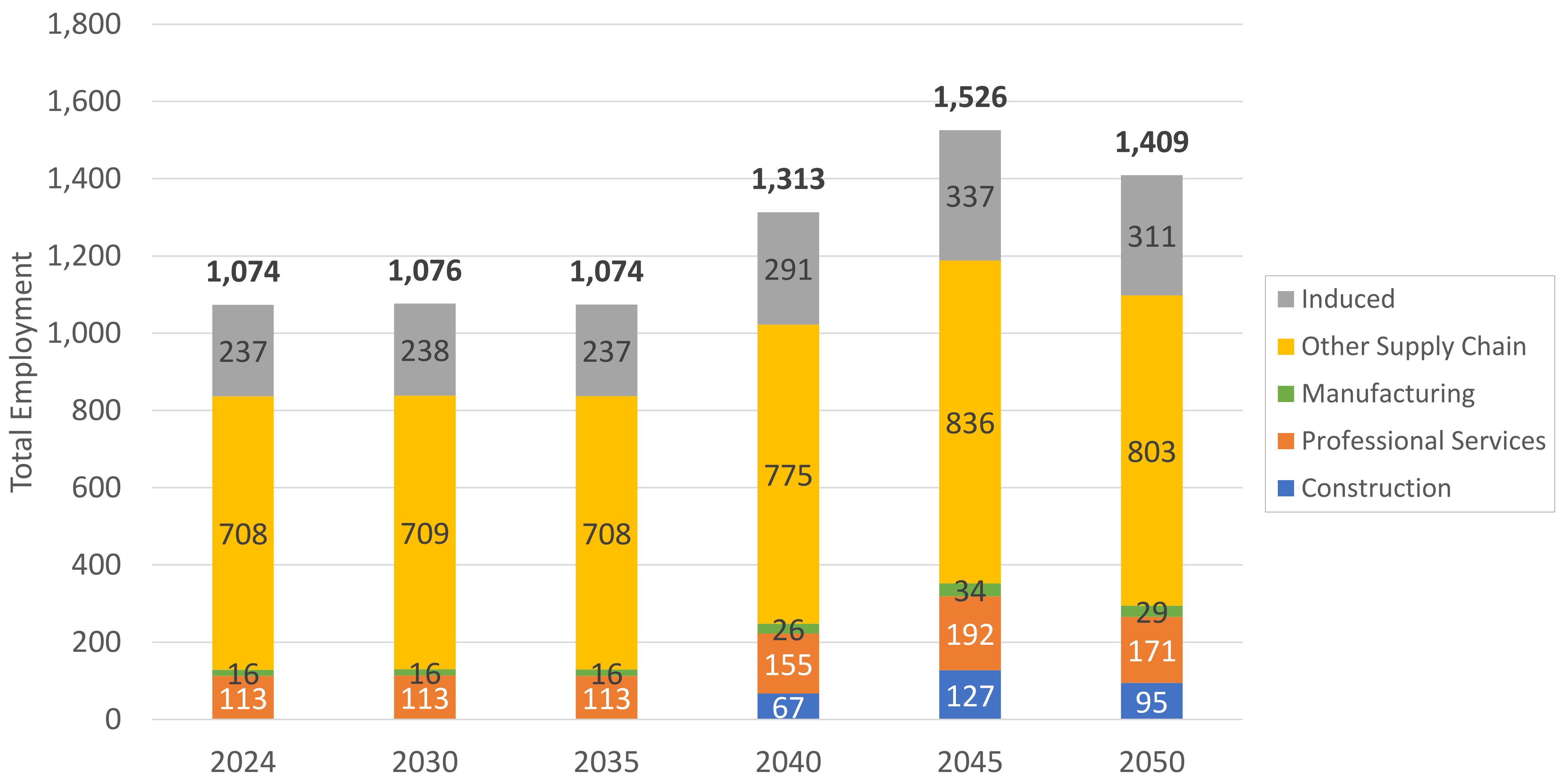


REFERENCE SCENARIO **INPUTS: BIOFUELS**, EAST OREGON

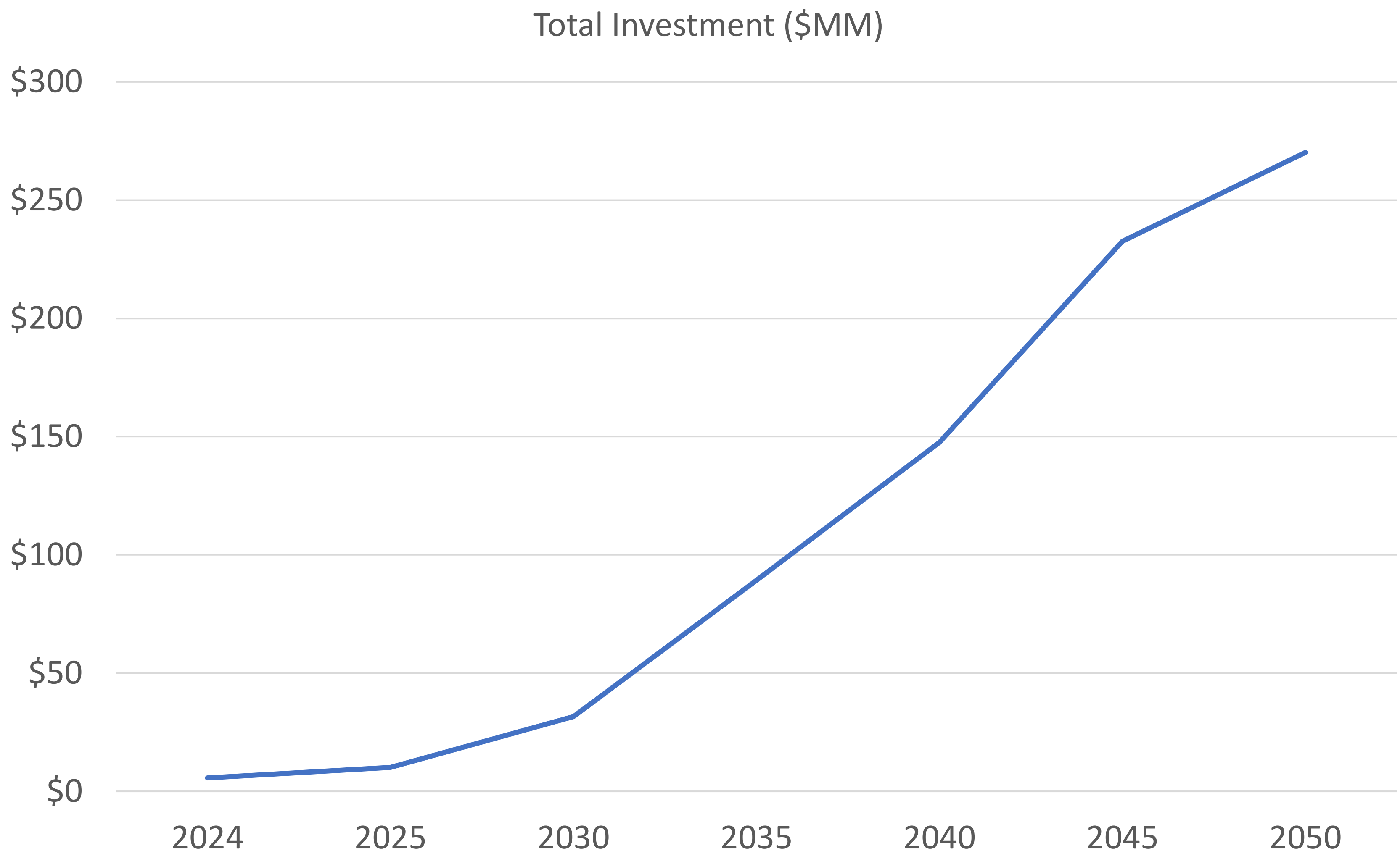


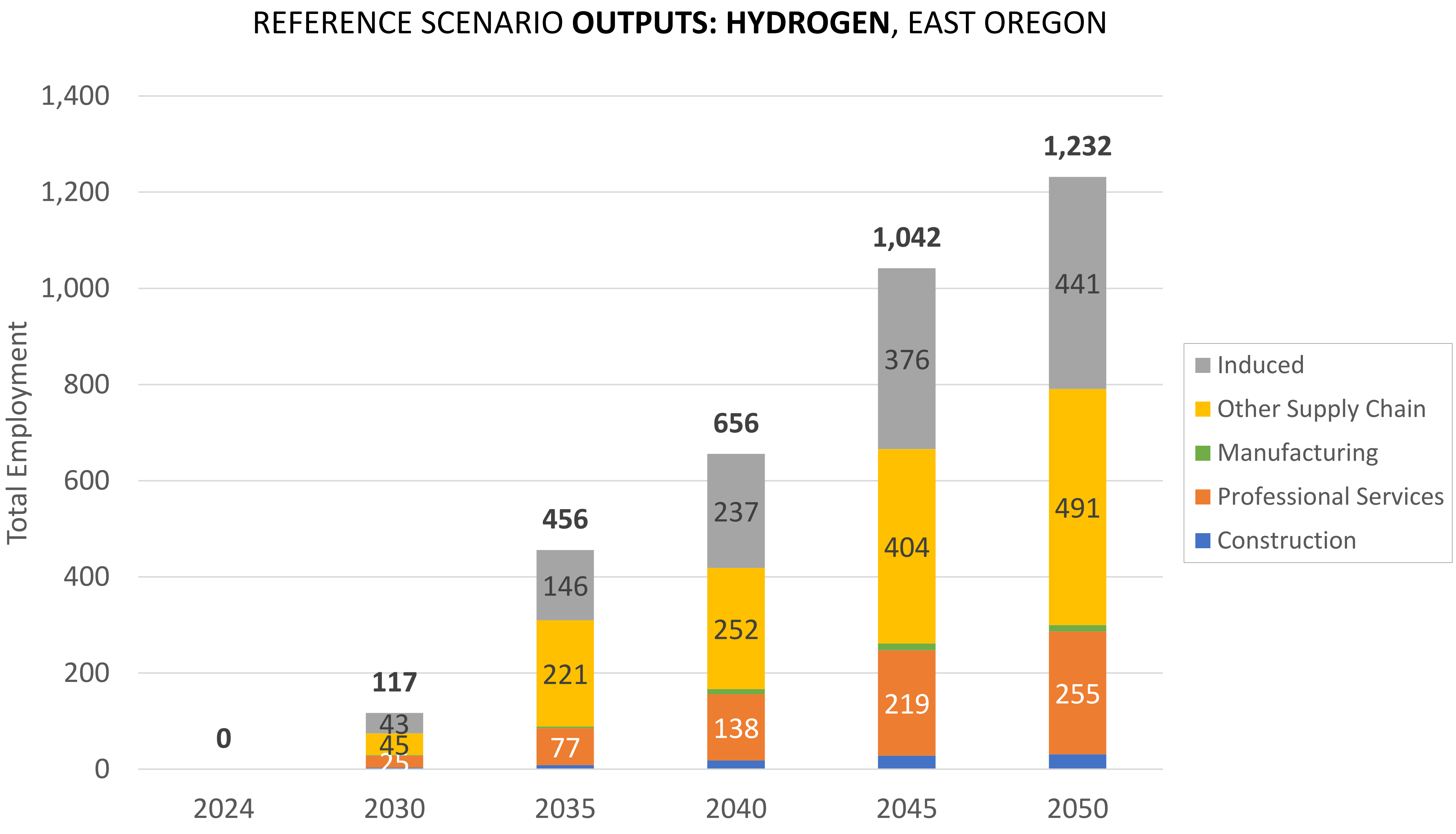
Investments in biofuel production and distribution jump starting in 2035.

REFERENCE SCENARIO **OUTPUTS: BIOFUELS**, EAST OREGON

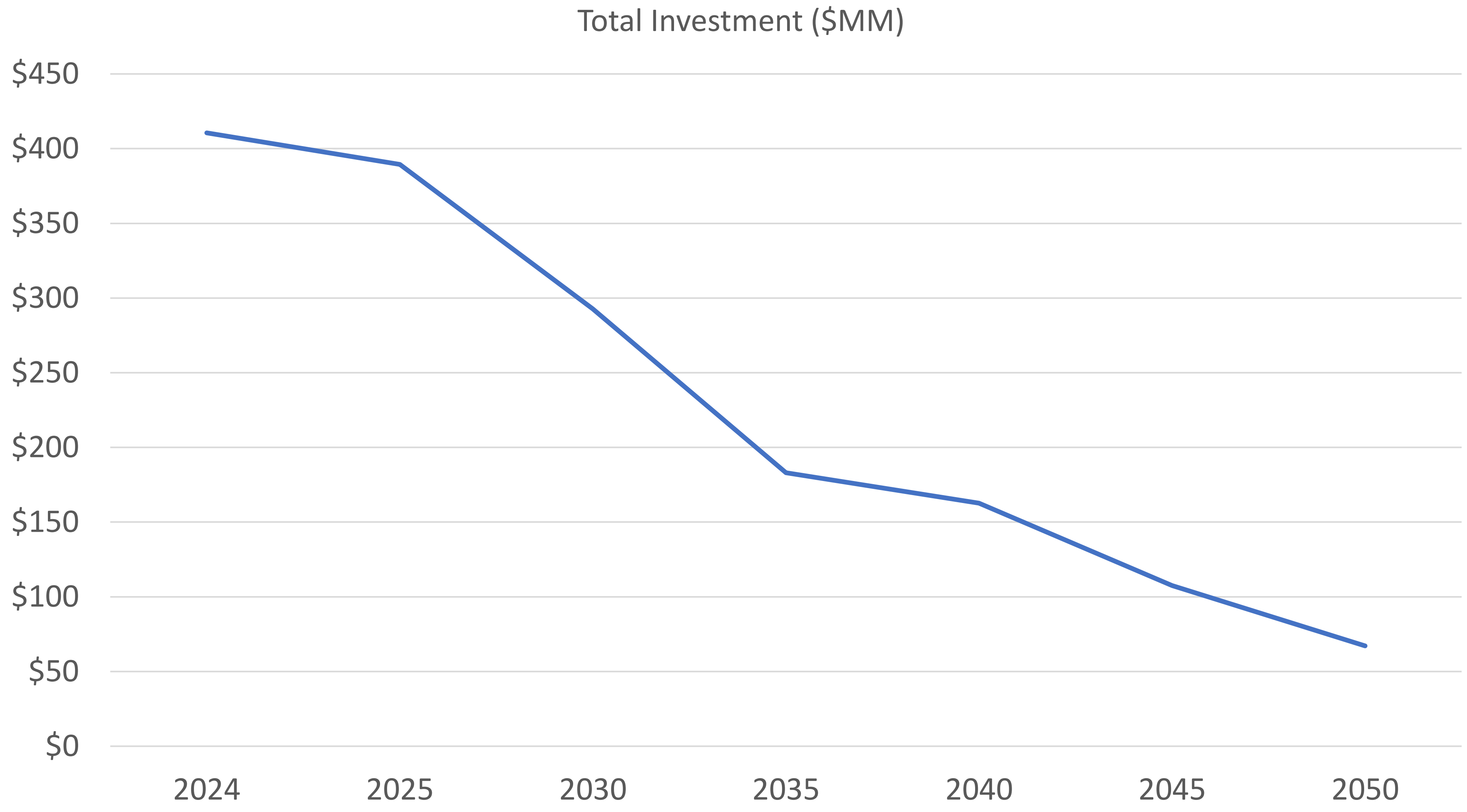


REFERENCE SCENARIO **INPUTS: HYDROGEN**, EAST OREGON

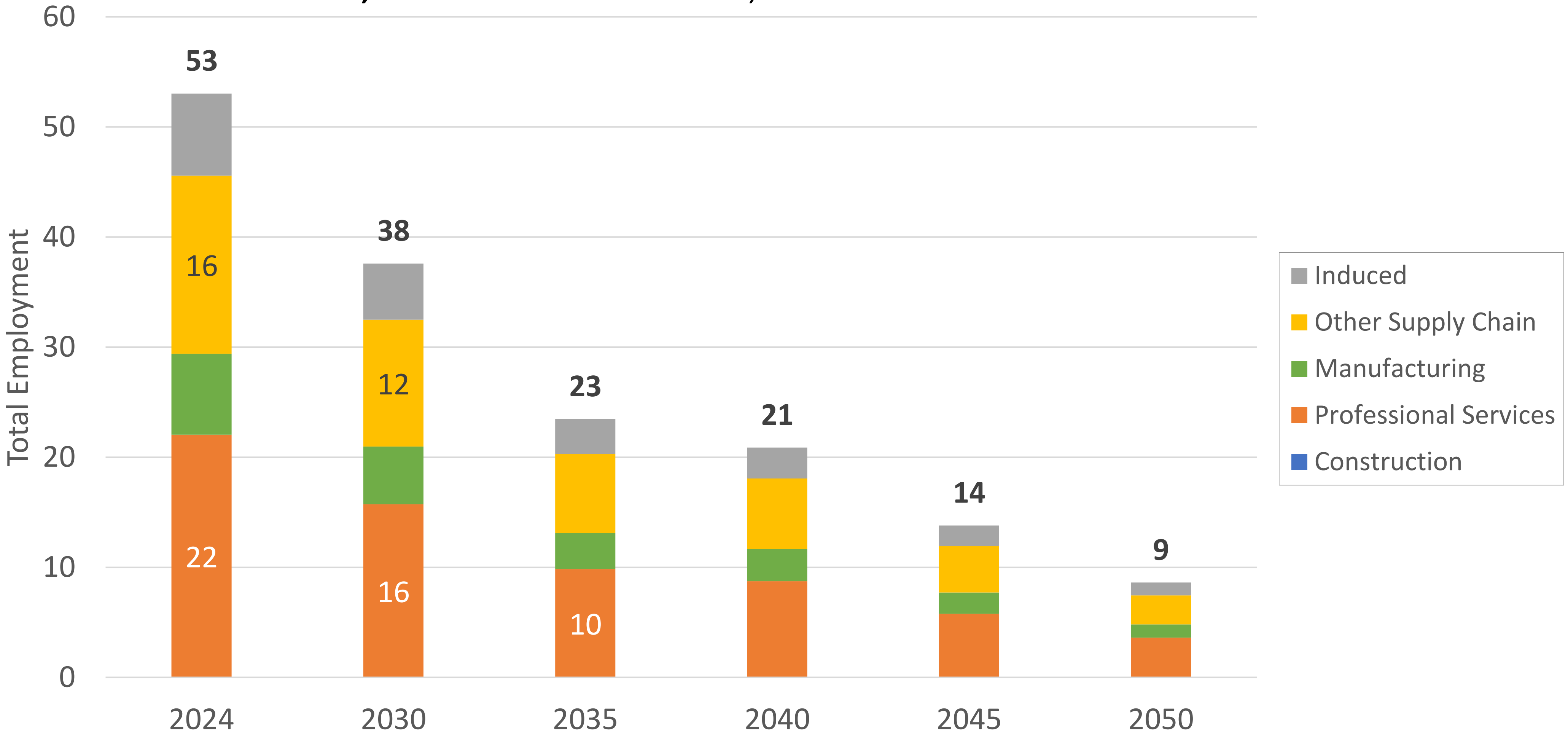



REFERENCE SCENARIO OUTPUTS: HYDROGEN, EAST OREGON
Total Employment
1,400
1,200
1,000
800
600
400
200
0
2024
2030
2035
2040
2045
2050
0
117
43
45
25
456
146
221
77
656
237
252
138
1,042
376
404
219
1,232
441
491
255
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

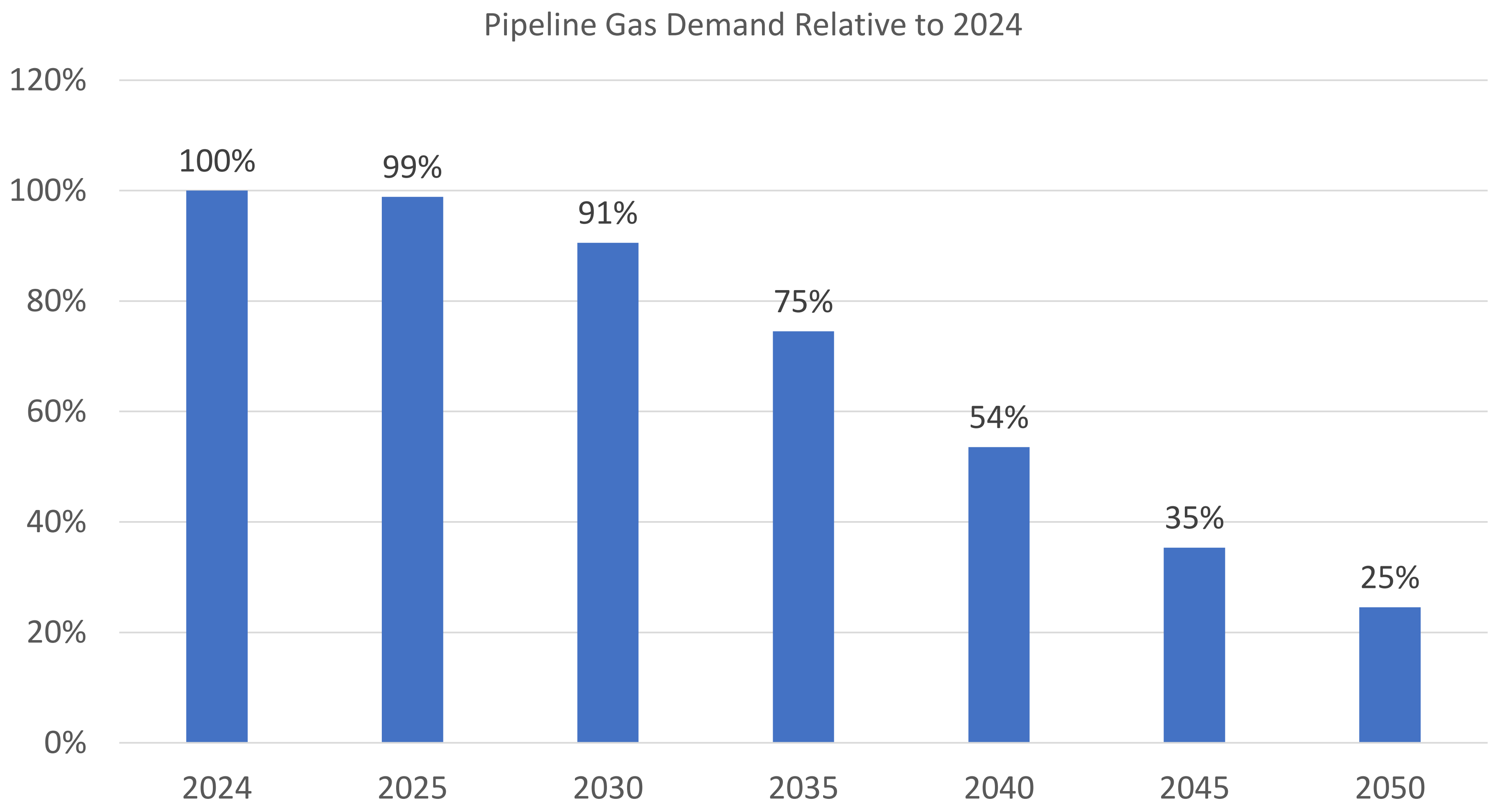
REFERENCE SCENARIO **INPUTS: NATURAL GAS PRODUCTION, TRADE, AND SUPPORT SERVICES**, EAST OREGON



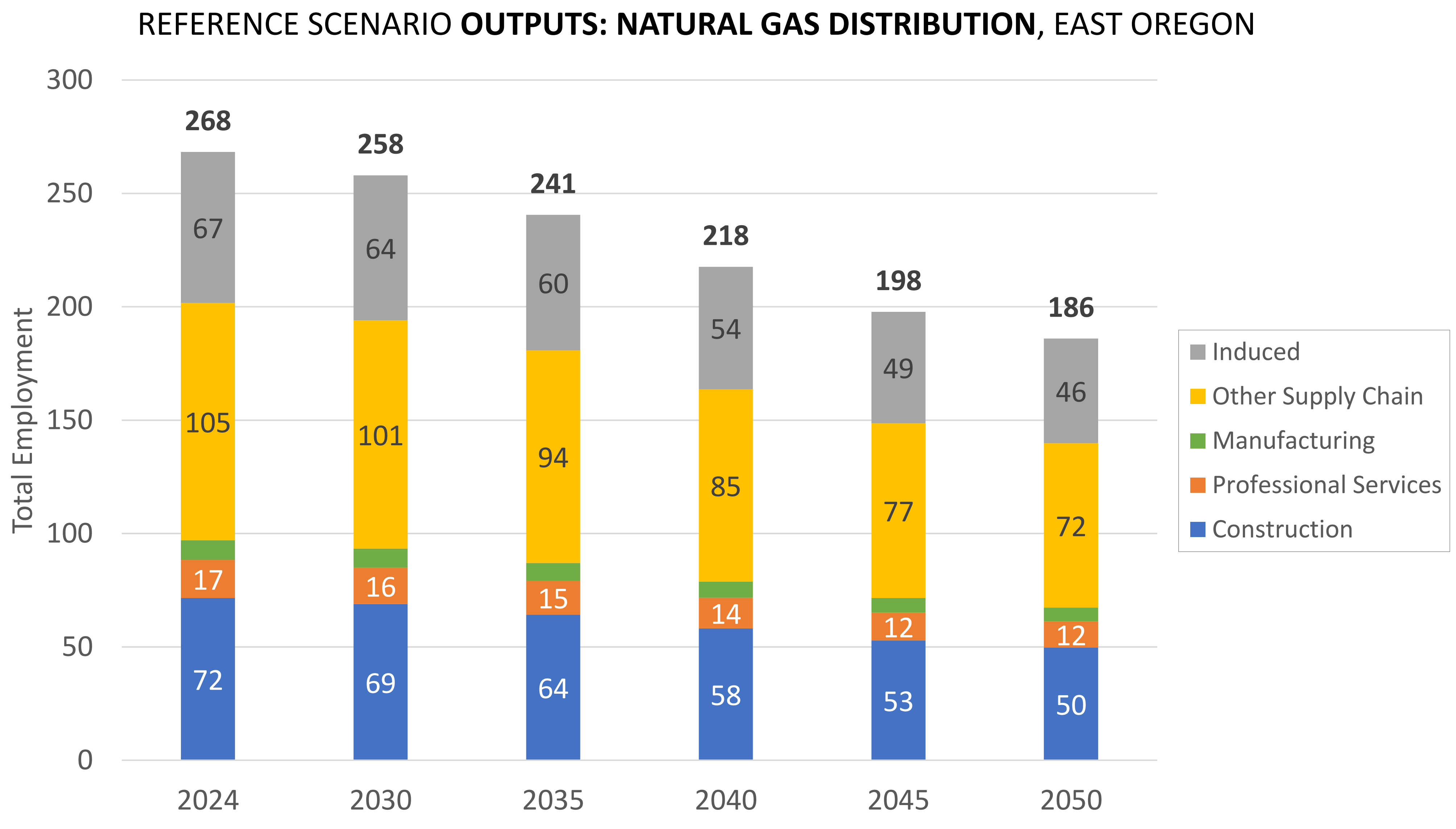
REFERENCE SCENARIO **OUTPUTS: NATURAL GAS PRODUCTION, TRADE, AND SUPPORT SERVICES**, EAST OREGON



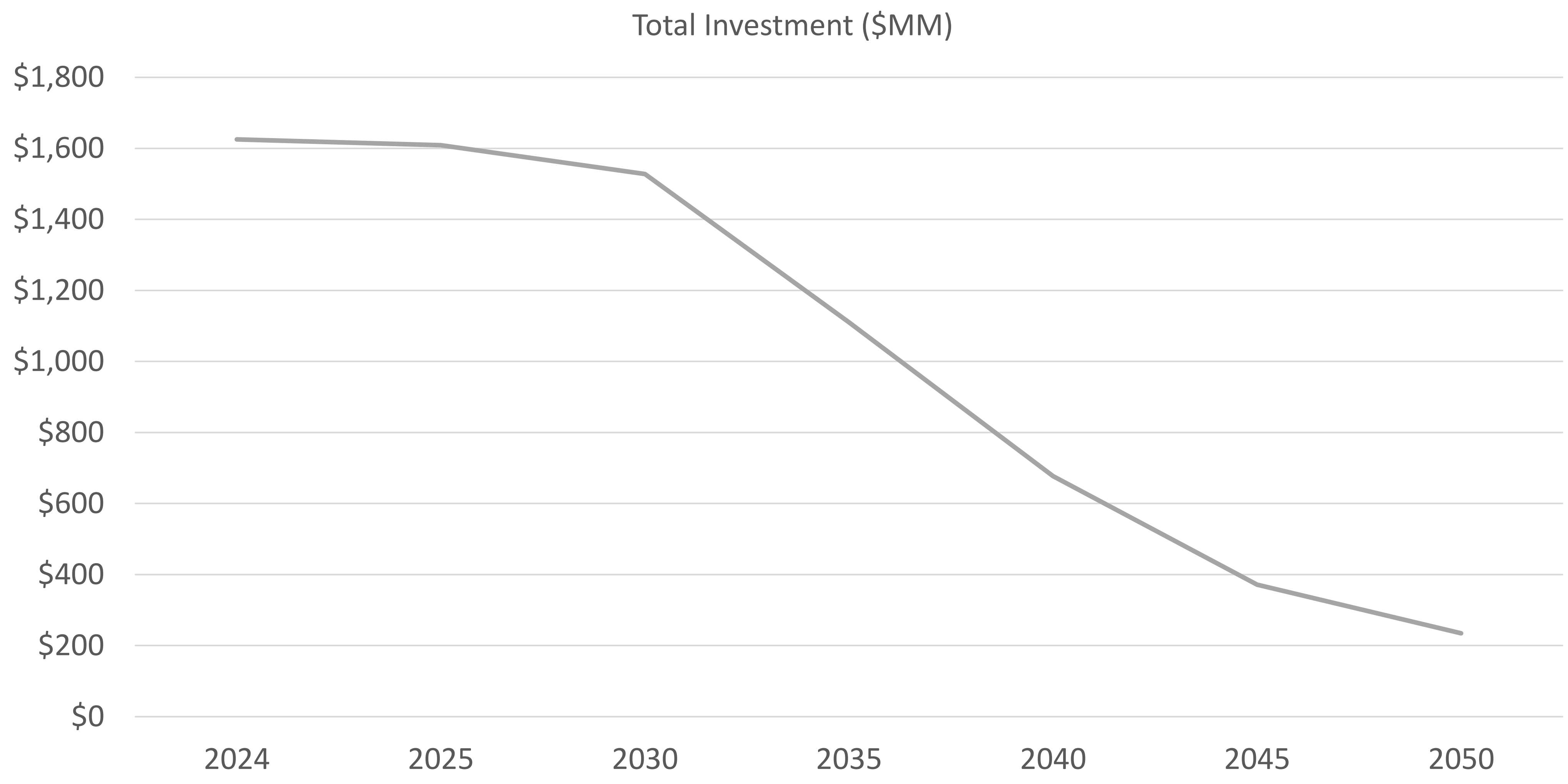
REFERENCE SCENARIO **INPUTS: NATURAL GAS DISTRIBUTION**, EAST OREGON



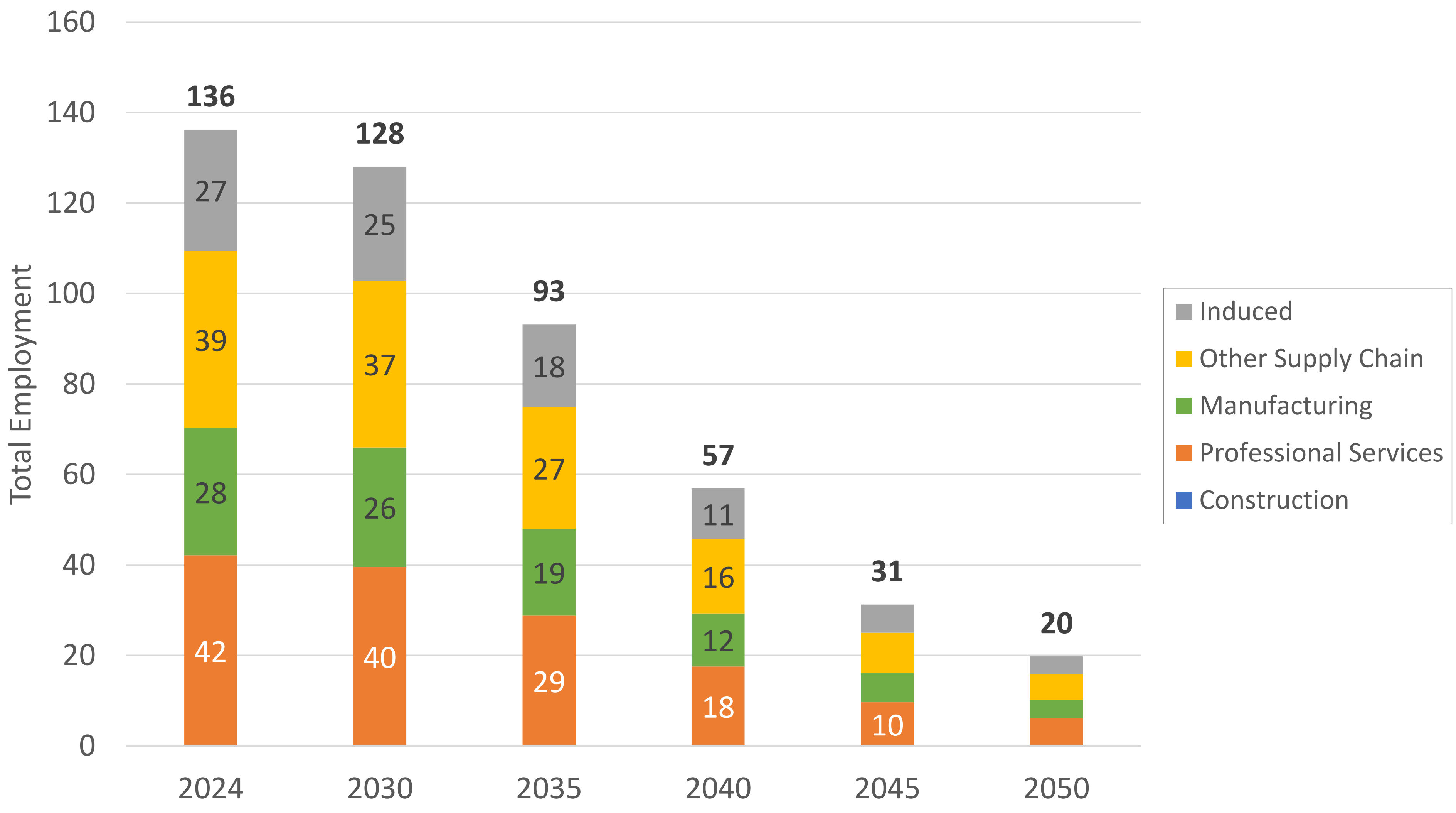
BWR uses pipeline gas demand derived from EER modeling to determine customer base, which serves as the input to the employment model.


REFERENCE SCENARIO **OUTPUTS: NATURAL GAS DISTRIBUTION**, EAST OREGON
Total Employment
300
250
200
150
100
50
0
268
258
241
218
198
186
67
64
60
54
49
46
105
101
94
85
77
72
17
16
15
14
12
12
72
69
64
58
53
50
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: OTHER FOSSIL FUELS**, EAST OREGON



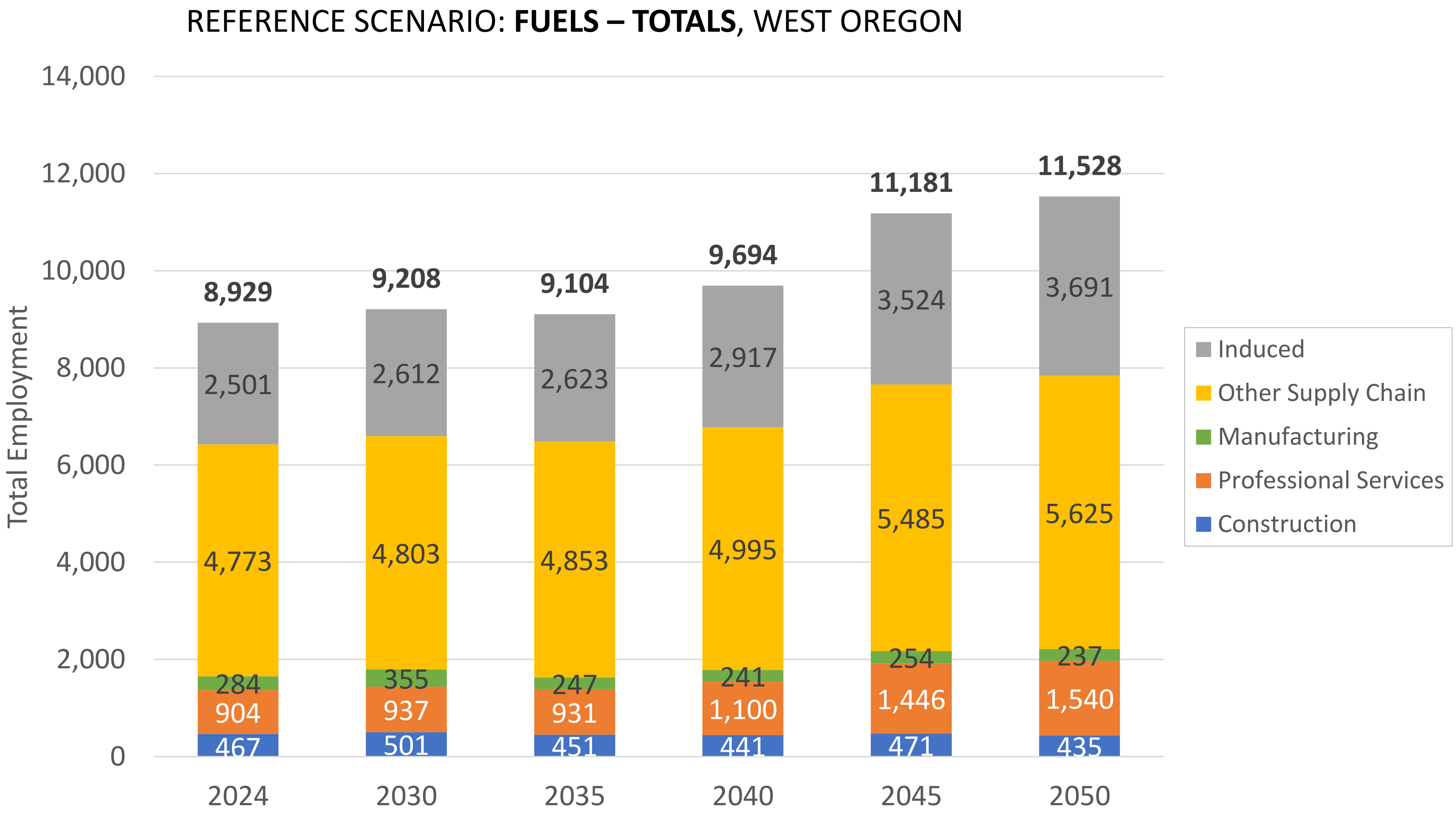
REFERENCE SCENARIO **OUTPUTS: OTHER FOSSIL FUELS**, EAST OREGON



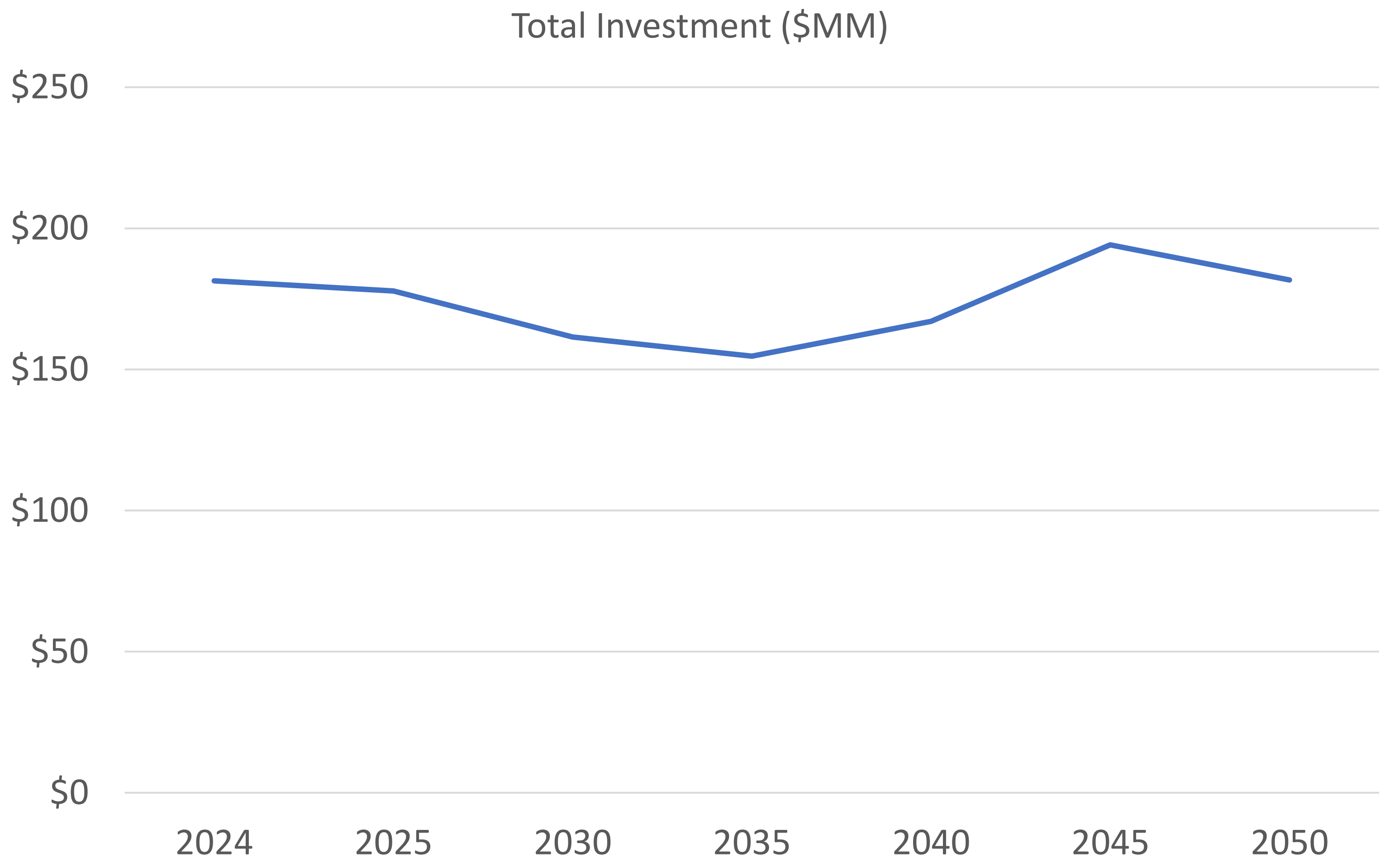
FUELS: REFERENCE, WEST OREGON*

SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Hydrogen	0	569	919	1,886	3,547	4,188
Sub-total	**0**	**569**	**919**	**1,886**	**3,547**	**4,188**
Change		**569**	**919**	**1,886**	**3,547**	**4,188**
Displacement Sub-Sectors						
Biofuels	5,110	5,002	4,966	5,045	5,237	5,131
Natural Gas Production, Trade, and Support Services	254	204	144	120	95	85
Natural Gas Distribution	2,929	2,836	2,663	2,412	2,181	2,056
Other Fossil Fuels	636	596	412	232	121	67
Sub-Total	**8,929**	**8,639**	**8,186**	**7,809**	**7,634**	**7,340**
Change		**-290**	**-743**	**-1,120**	**-1,295**	**-1,589**
Fuels OVERALL	**8,929**	**9,208**	**9,104**	**9,694**	**11,181**	**11,528**
Net Change from 2024		**279**	**175**	**765**	**2,252**	**2,599**

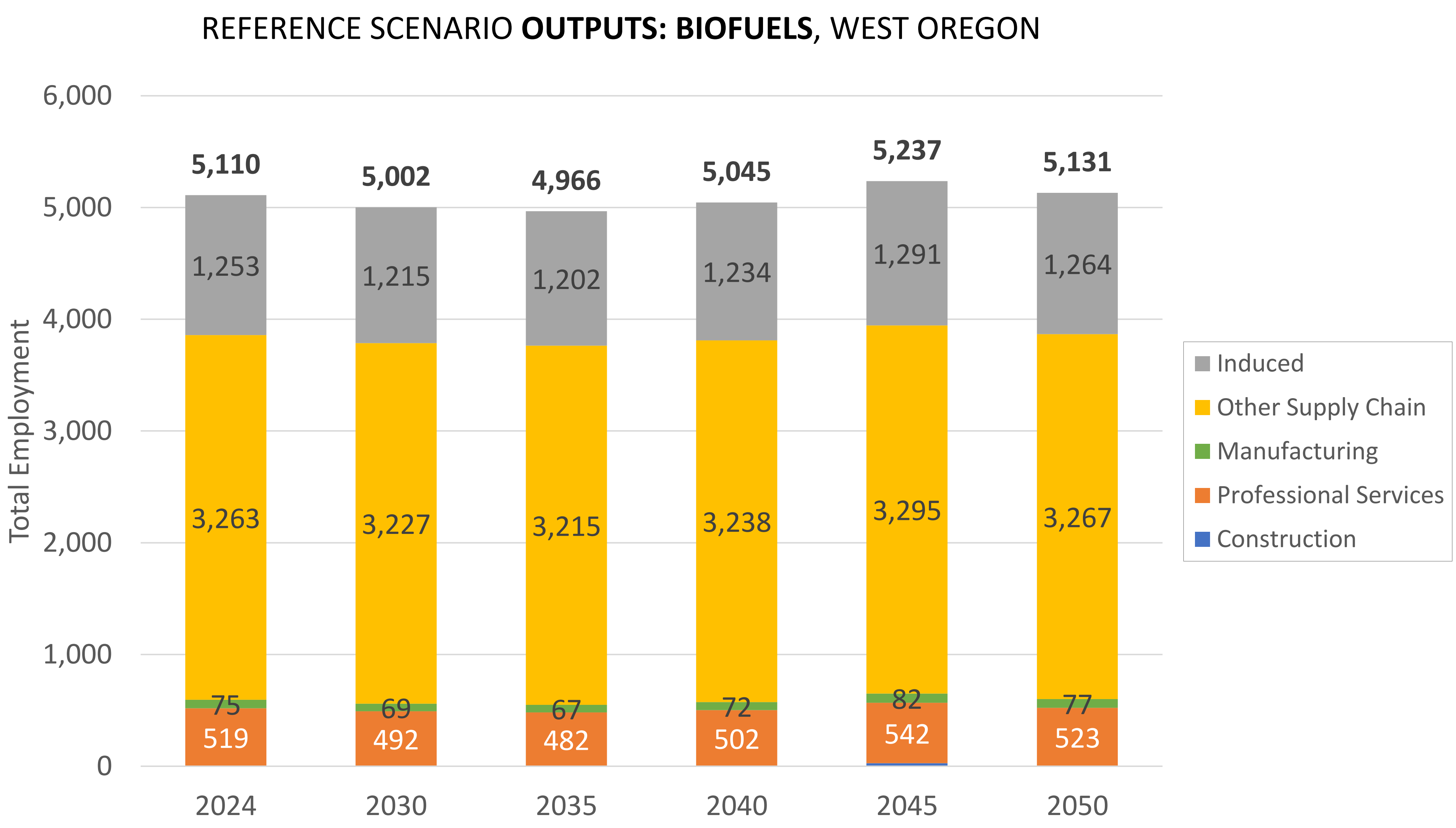
**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*


REFERENCE SCENARIO: FUELS – TOTALS, WEST OREGON
Total Employment
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2024
2030
2035
2040
2045
2050
8,929
9,208
9,104
9,694
11,181
11,528
2,501
2,612
2,623
2,917
3,524
3,691
4,773
4,803
4,853
4,995
5,485
5,625
284
355
247
241
254
237
904
937
931
1,100
1,446
1,540
467
501
451
441
471
435
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

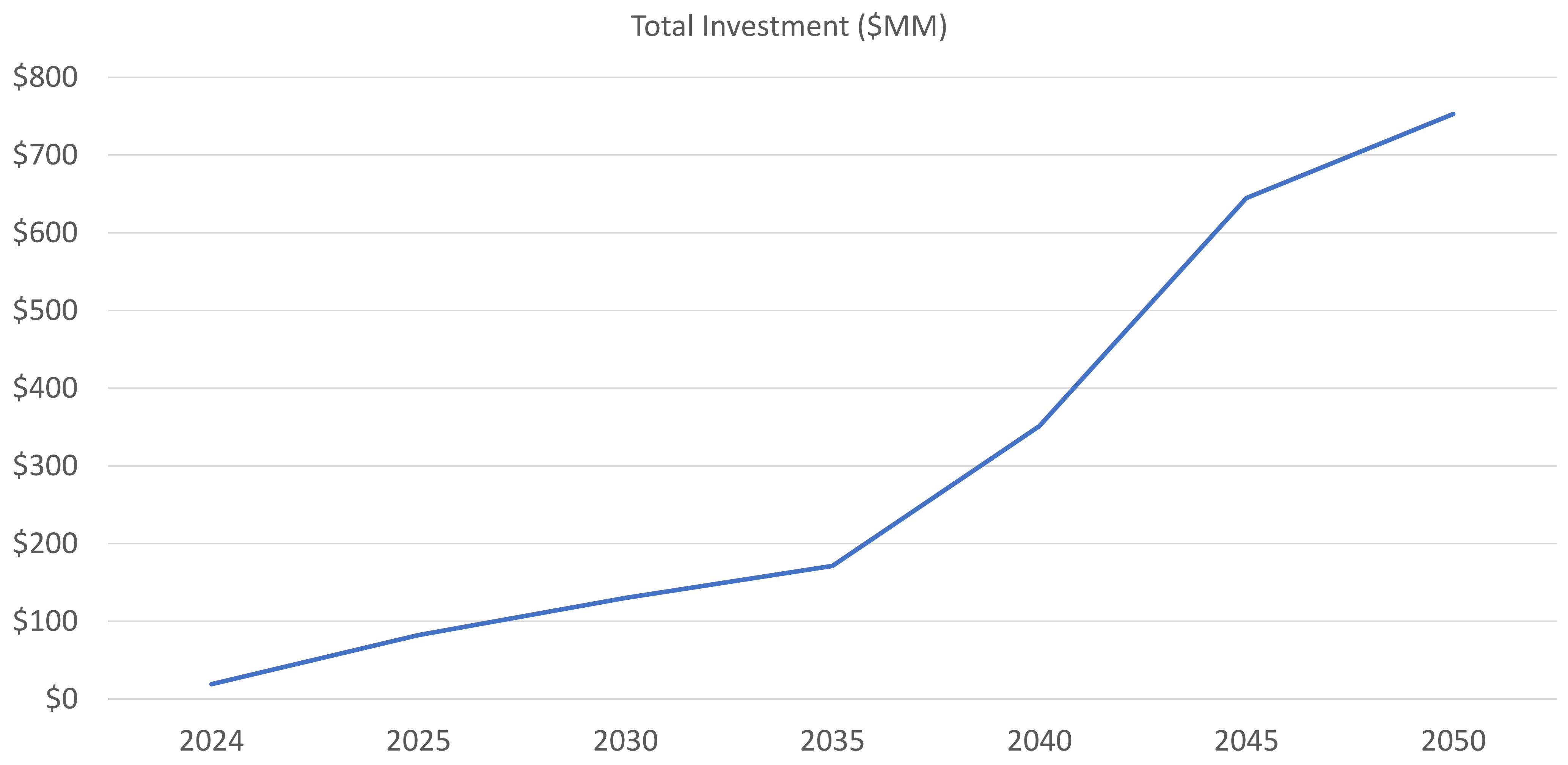
REFERENCE SCENARIO **INPUTS: BIOFUELS**, WEST OREGON

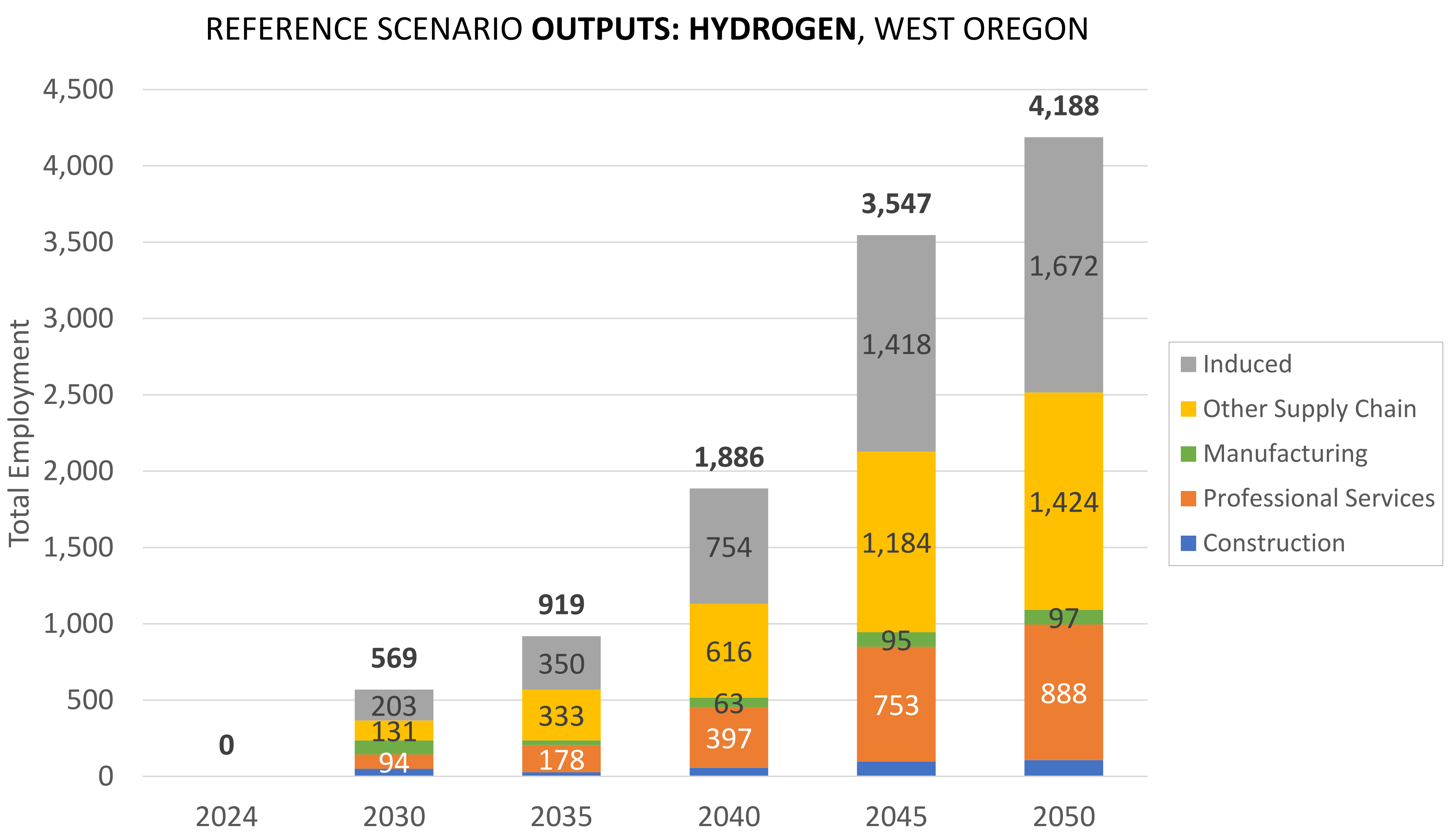


Investments in biofuel production and distribution decline through 2035 due to ongoing electrification of buildings and the vehicle fleet, then recover in later years.

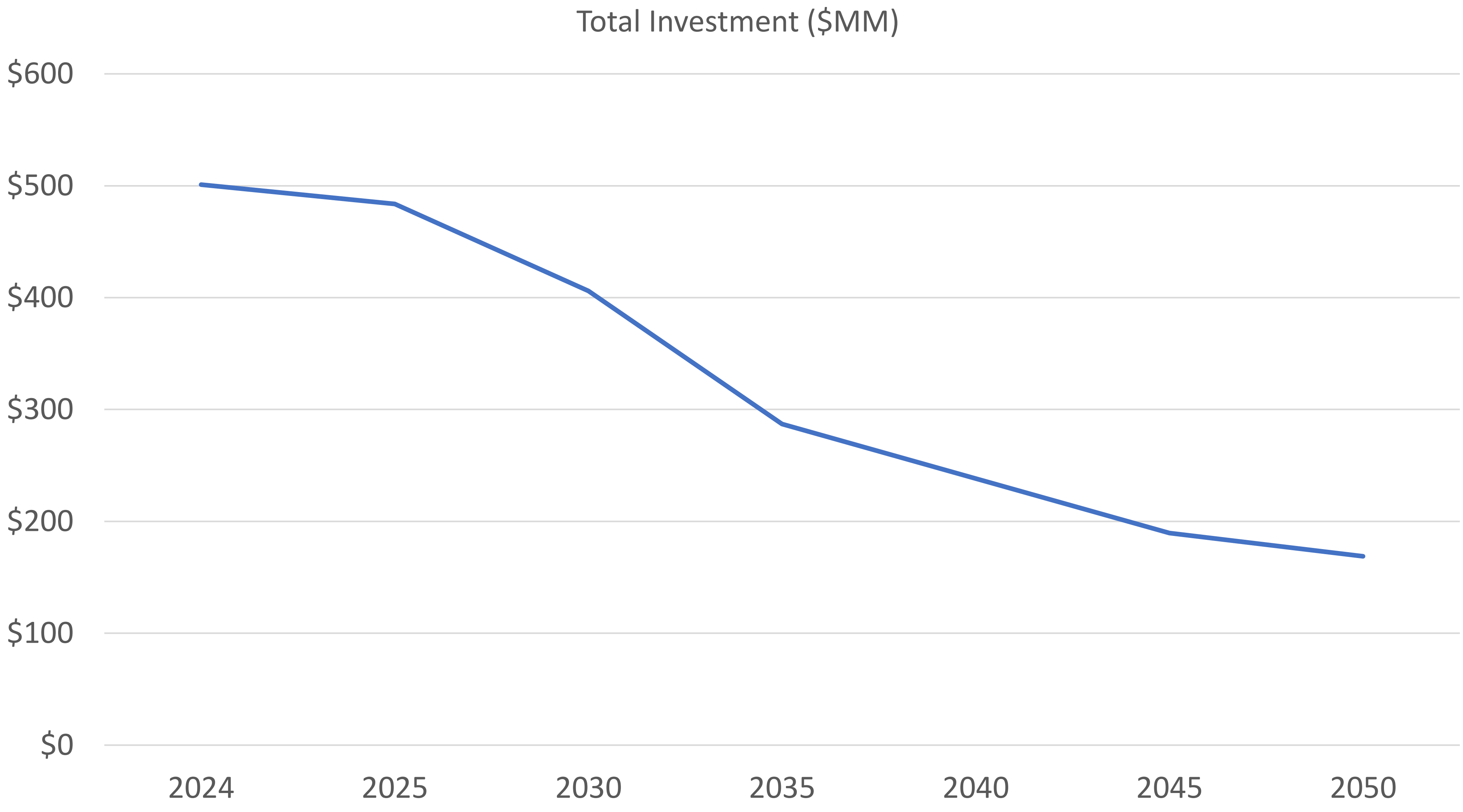

REFERENCE SCENARIO **OUTPUTS: BIOFUELS**, WEST OREGON
Total Employment
6,000
5,000
4,000
3,000
2,000
1,000
0
5,110
5,002
4,966
5,045
5,237
5,131
1,253
1,215
1,202
1,234
1,291
1,264
3,263
3,227
3,215
3,238
3,295
3,267
75
69
67
72
82
77
519
492
482
502
542
523
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: HYDROGEN**, WEST OREGON

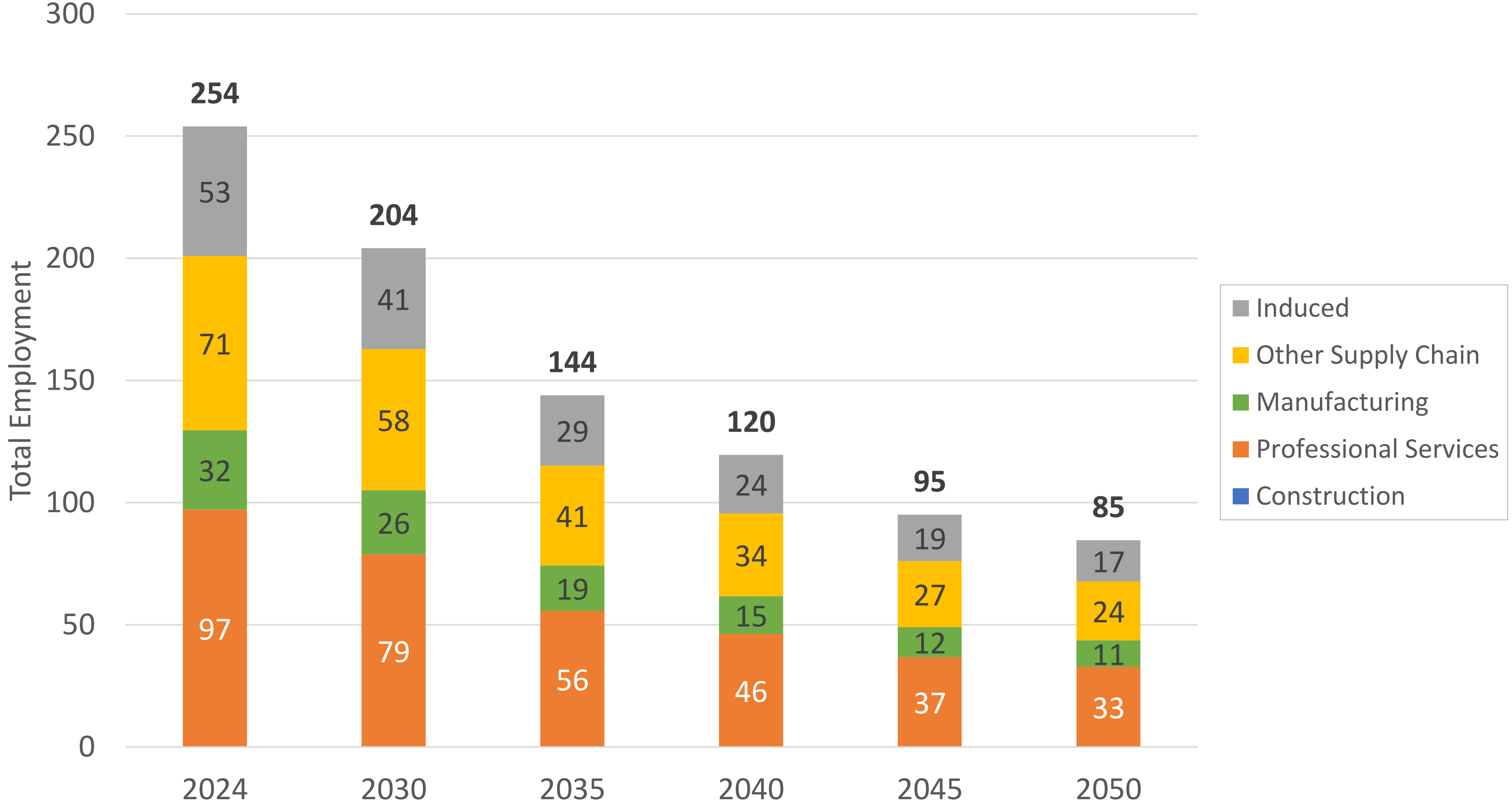



REFERENCE SCENARIO OUTPUTS: HYDROGEN, WEST OREGON
Total Employment
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2024
2030
2035
2040
2045
2050
0
569
203
131
94
919
350
333
178
1,886
754
616
63
397
3,547
1,418
1,184
95
753
4,188
1,672
1,424
97
888
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

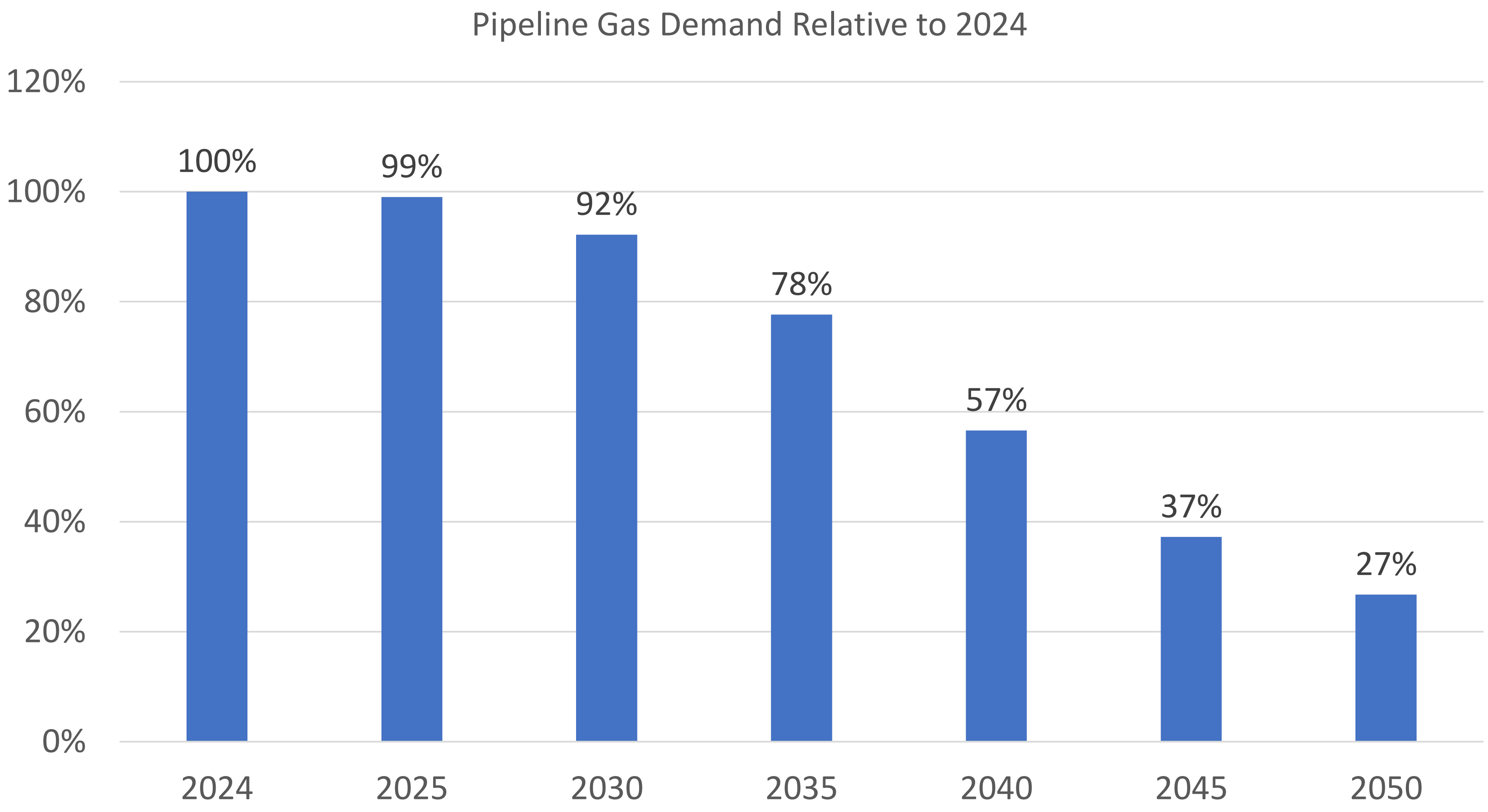
REFERENCE SCENARIO **INPUTS: NATURAL GAS PRODUCTION, TRADE, AND SUPPORT SERVICES**, WEST OREGON



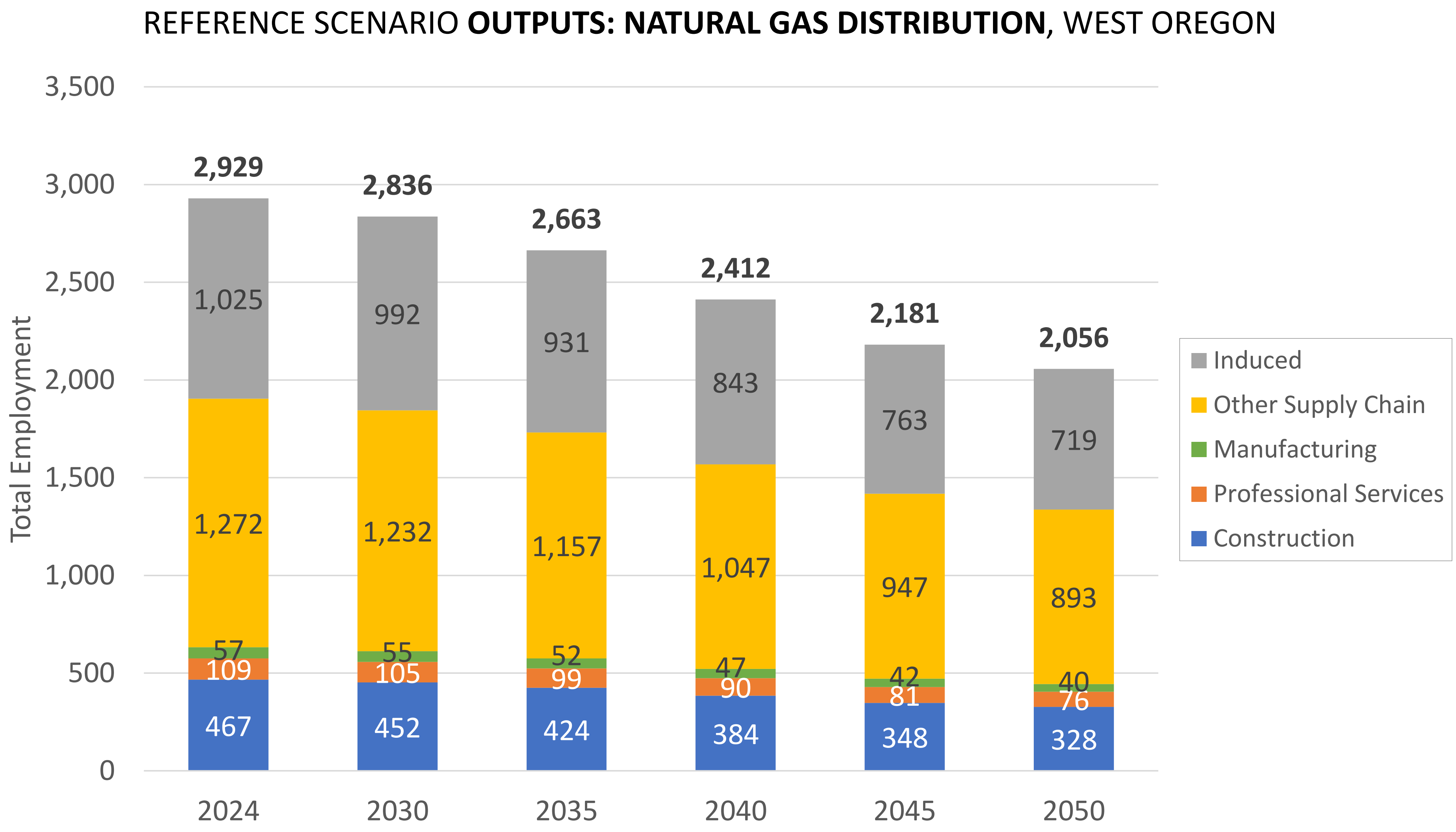
REFERENCE SCENARIO **OUTPUTS: NATURAL GAS PRODUCTION, TRADE, AND SUPPORT SERVICES**, WEST OREGON



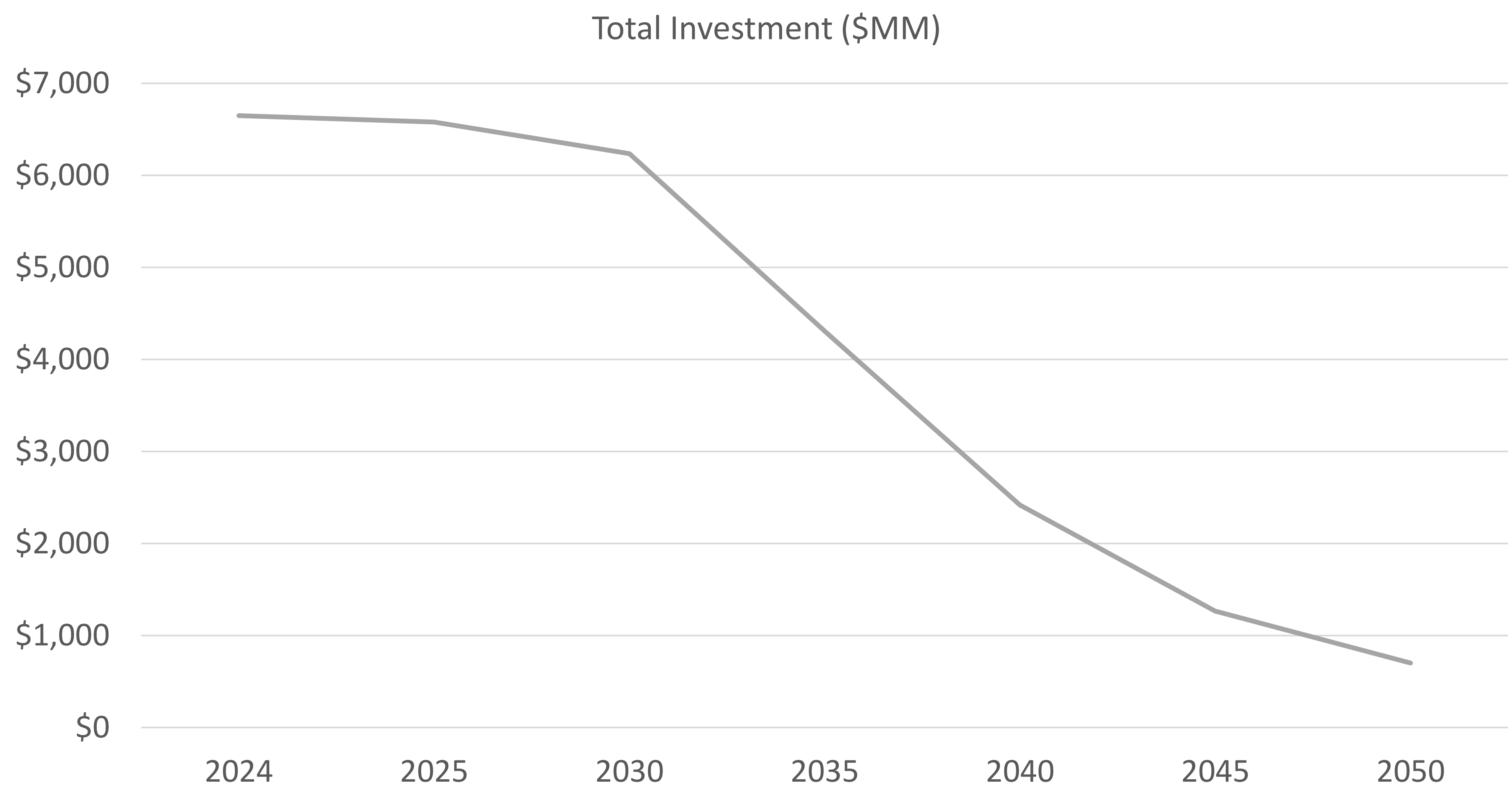
REFERENCE SCENARIO **INPUTS: NATURAL GAS DISTRIBUTION**, WEST OREGON

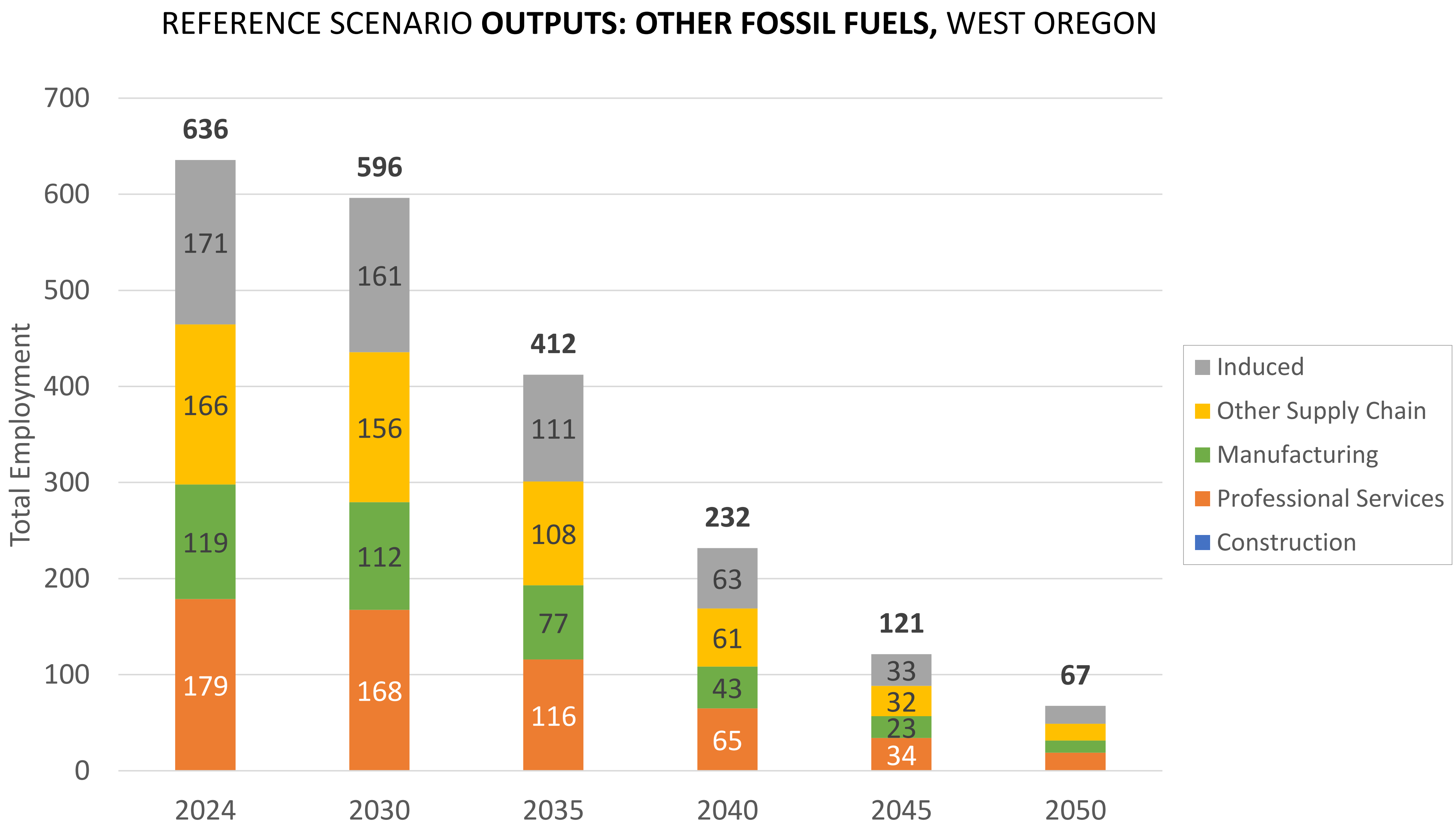


BWR uses pipeline gas demand derived from EER modeling to determine customer base, which serves as the input to the employment model.


REFERENCE SCENARIO OUTPUTS: NATURAL GAS DISTRIBUTION, WEST OREGON
Total Employment
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2024
2030
2035
2040
2045
2050
2,929
2,836
2,663
2,412
2,181
2,056
1,025
992
931
843
763
719
1,272
1,232
1,157
1,047
947
893
57
55
52
47
42
40
109
105
99
90
81
76
467
452
424
384
348
328
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: OTHER FOSSIL FUELS,** WEST OREGON




REFERENCE SCENARIO **OUTPUTS: OTHER FOSSIL FUELS,** WEST OREGON
Total Employment
700
600
500
400
300
200
100
0
636
171
166
119
179
596
161
156
112
168
412
111
108
77
116
232
63
61
43
65
121
33
32
23
34
67
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

Oregon Energy Strategy

Part 3: Initial Employment Outputs

Buildings

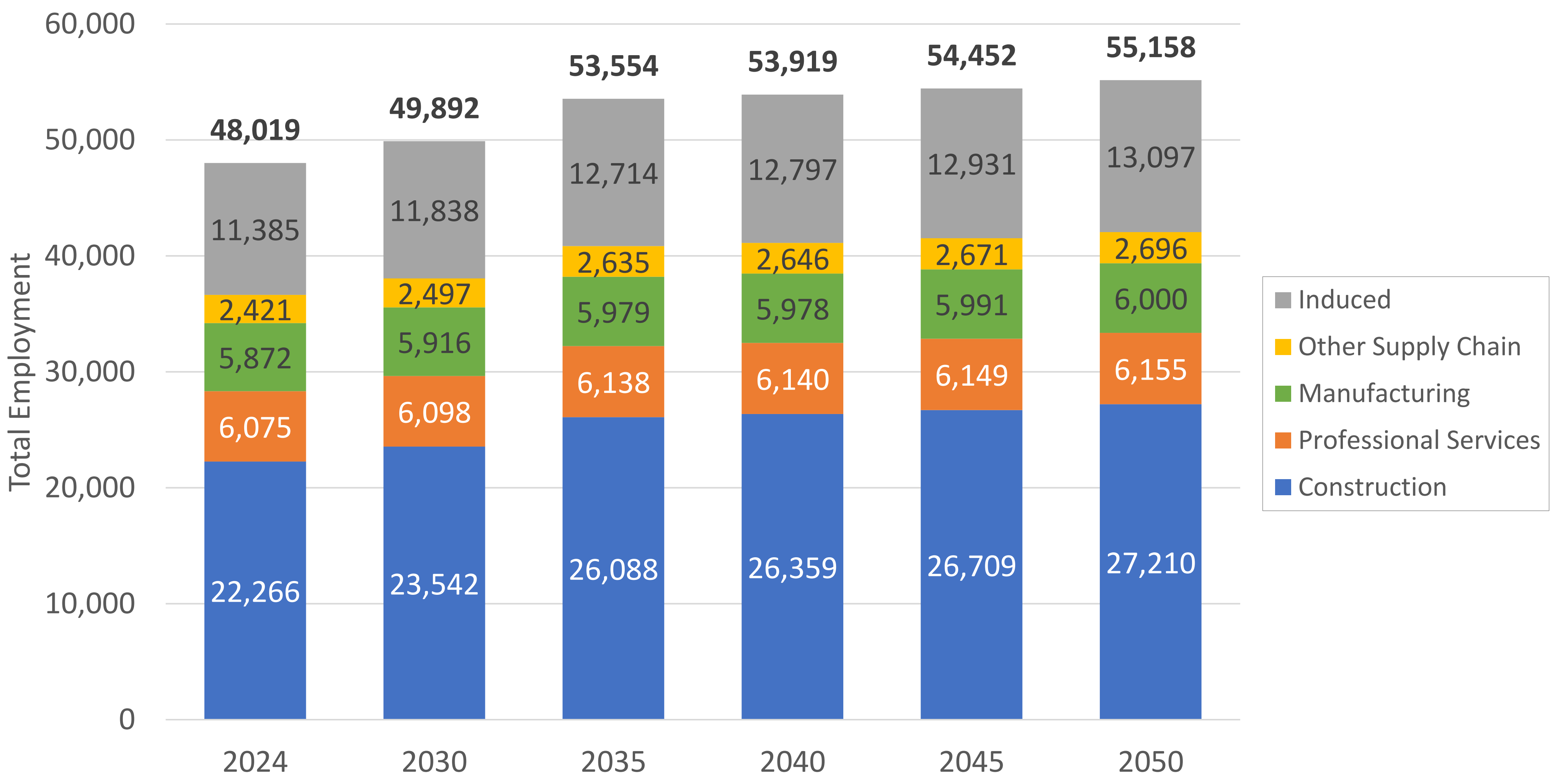
III. Buildings

1. Commercial HVAC
2. Commercial Other
3. Residential HVAC
4. Residential Shell
5. Residential Other

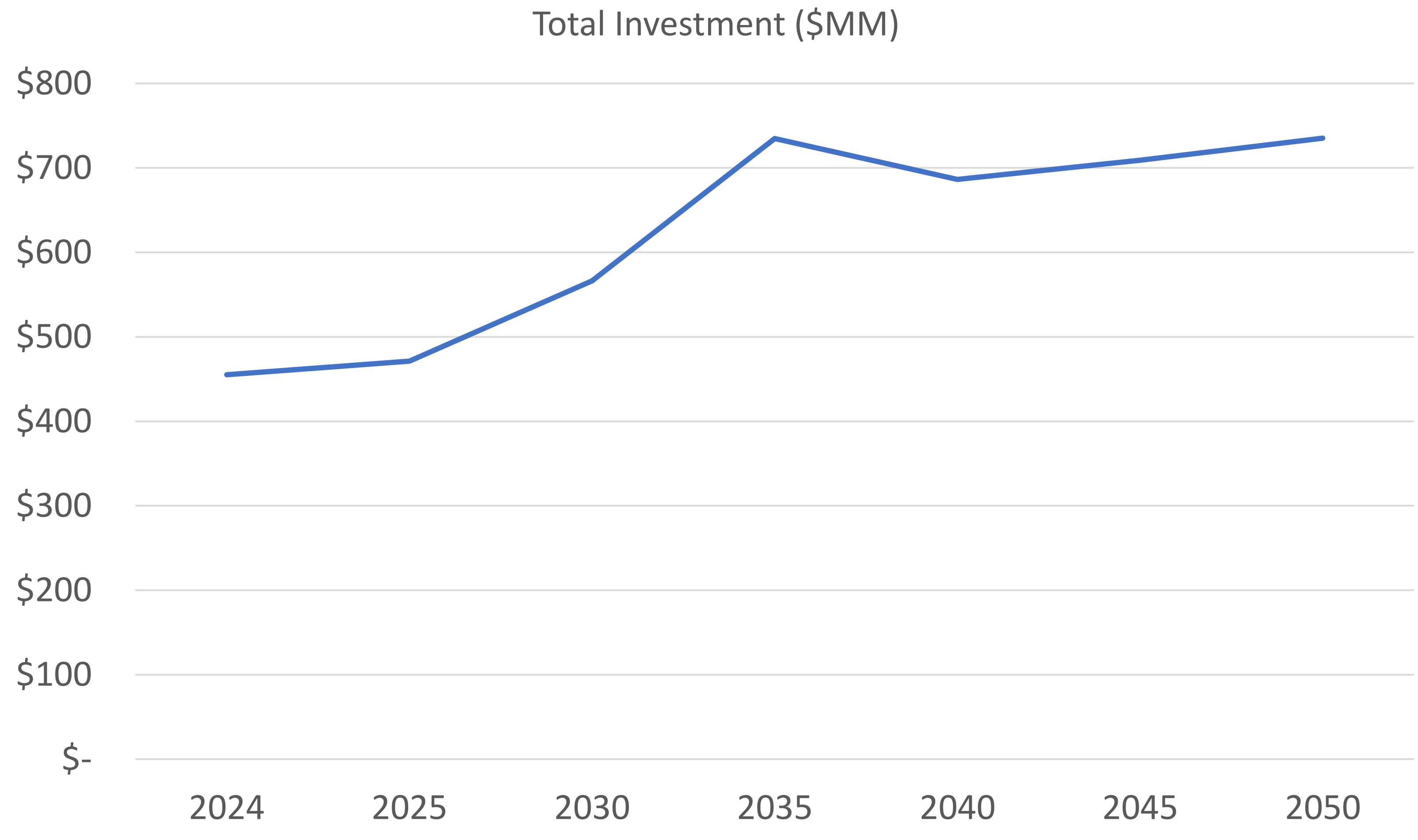
BUILDINGS: REFERENCE, OREGON

SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Commercial HVAC	11,230	11,992	13,145	12,814	12,970	13,149
Residential HVAC	15,833	15,801	16,341	16,531	16,813	17,061
Residential Shell	6,813	7,162	7,394	7,407	7,426	7,442
Commercial Other	5,870	6,320	6,962	7,204	7,753	7,717
Residential Other	8,273	8,617	9,712	9,963	9,490	9,789
Buildings OVERALL	**48,019**	**49,892**	**53,554**	**53,919**	**54,452**	**55,158**
Net Change from 2024		**1,874**	**5,535**	**5,901**	**6,433**	**7,139**

REFERENCE SCENARIO: **BUILDINGS – TOTALS,** OREGON

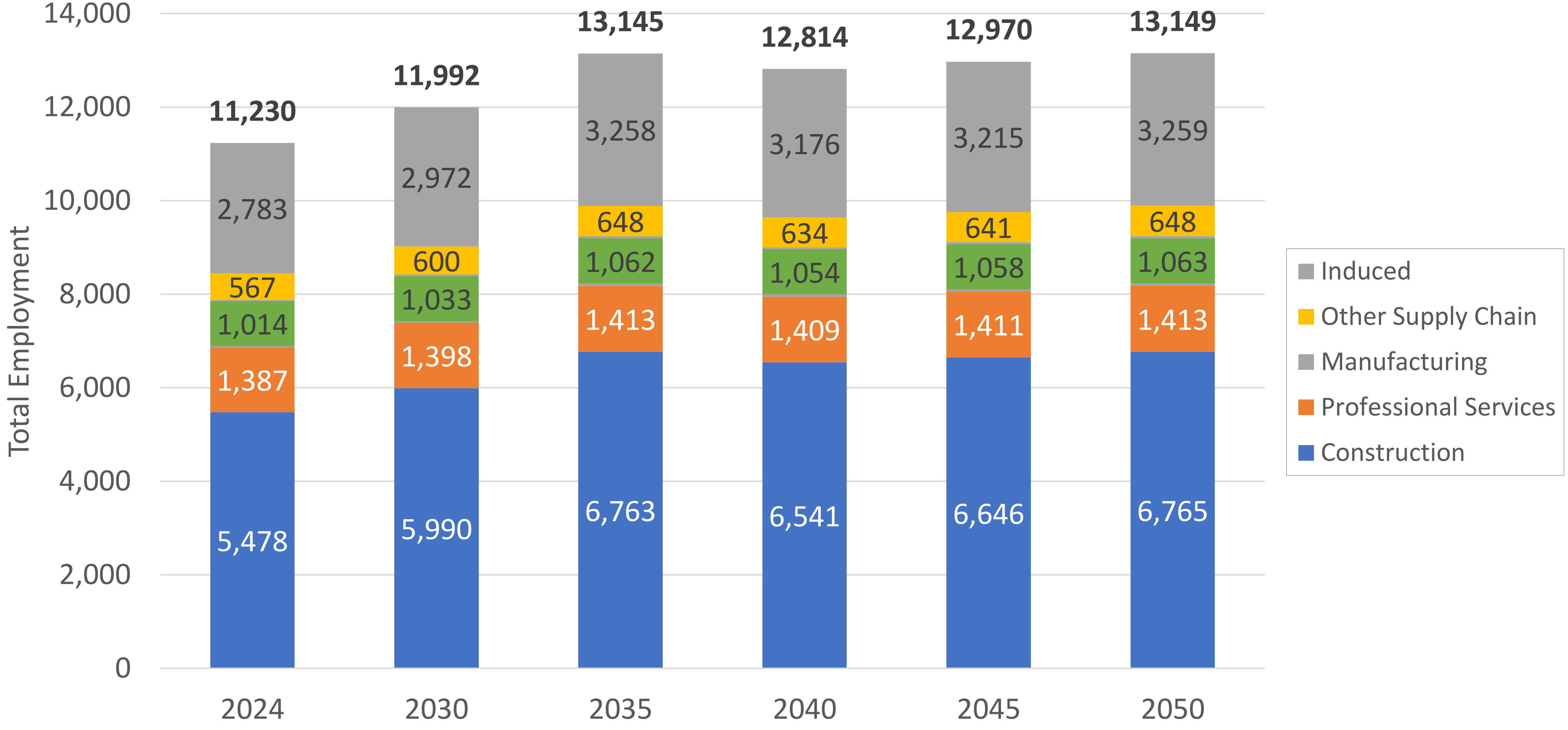


REFERENCE SCENARIO **INPUTS: COMMERCIAL HVAC,** OREGON

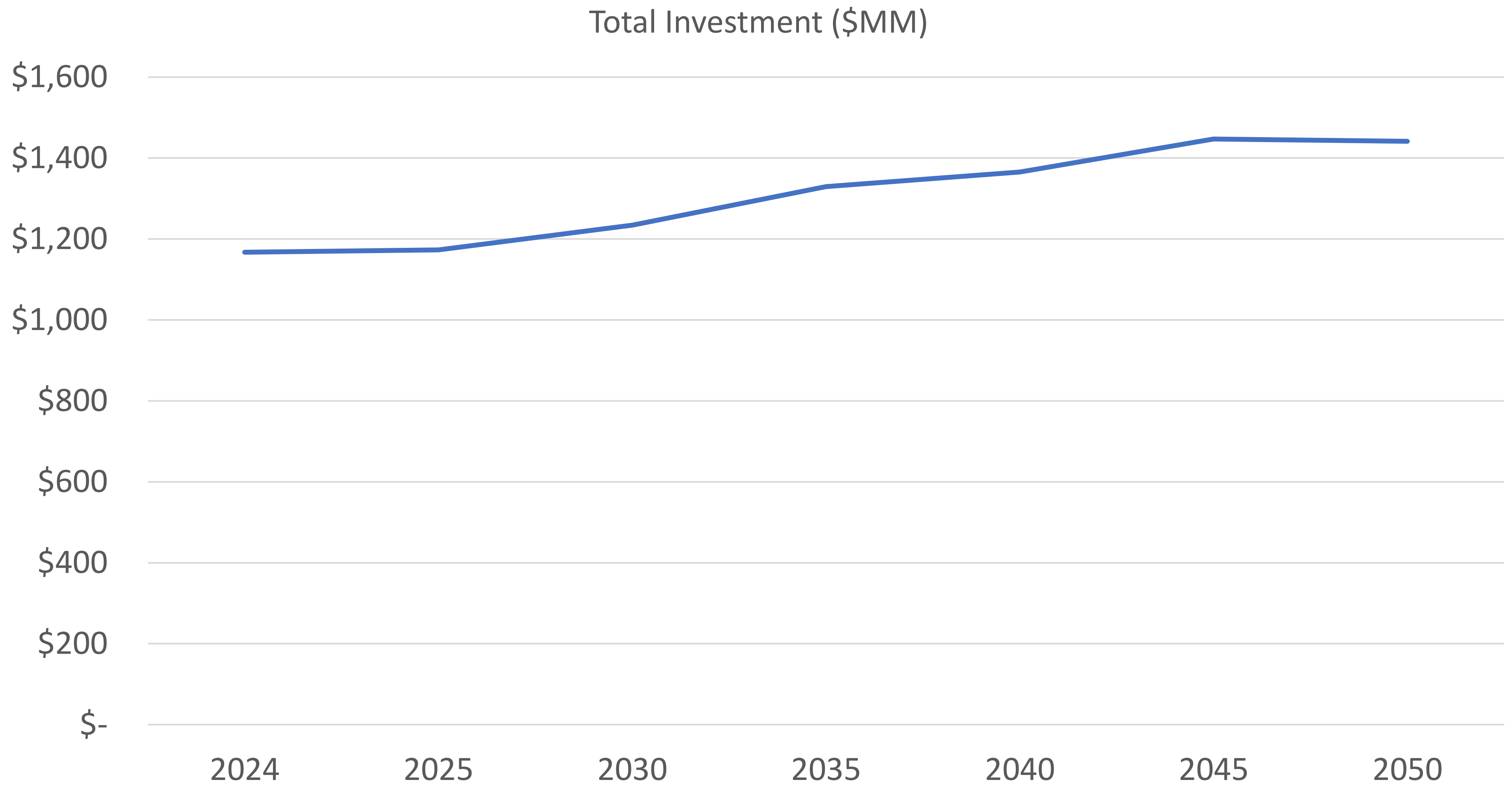


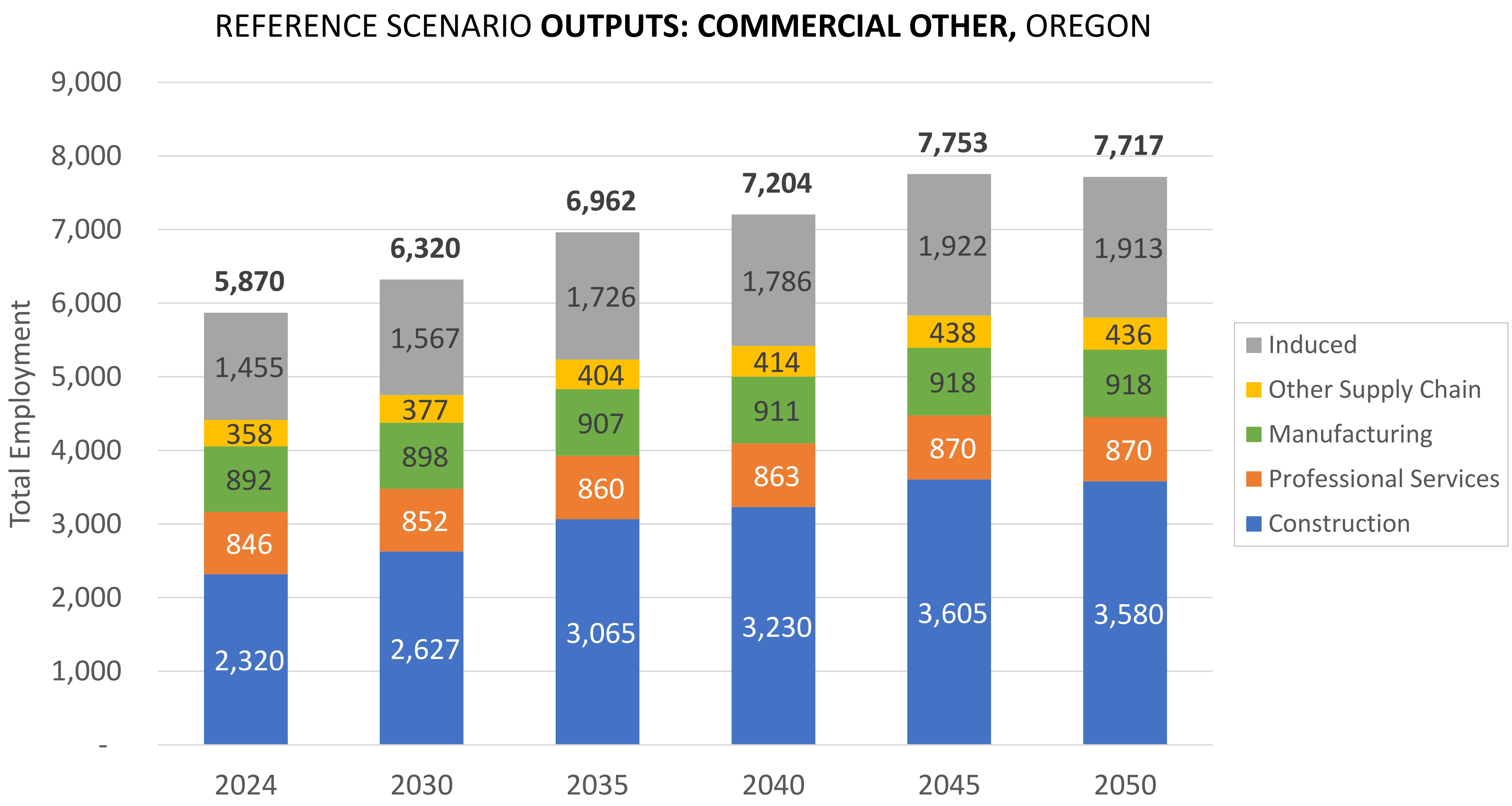
Investments in commercial HVAC devices based on consumer adoption rates from EER modeling.

REFERENCE SCENARIO **OUTPUTS: COMMERCIAL HVAC,** OREGON

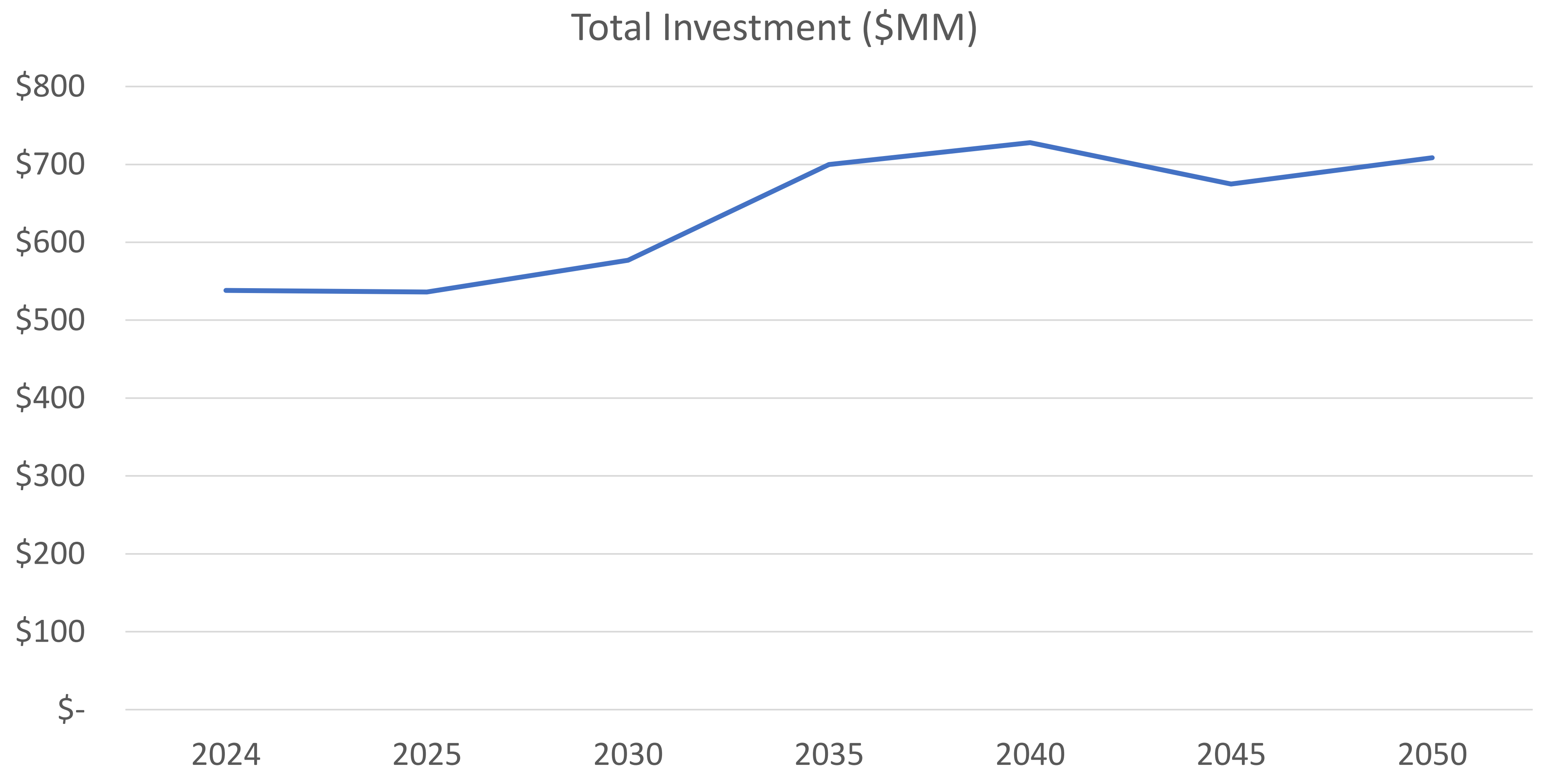


REFERENCE SCENARIO **INPUTS: COMMERCIAL OTHER,** OREGON

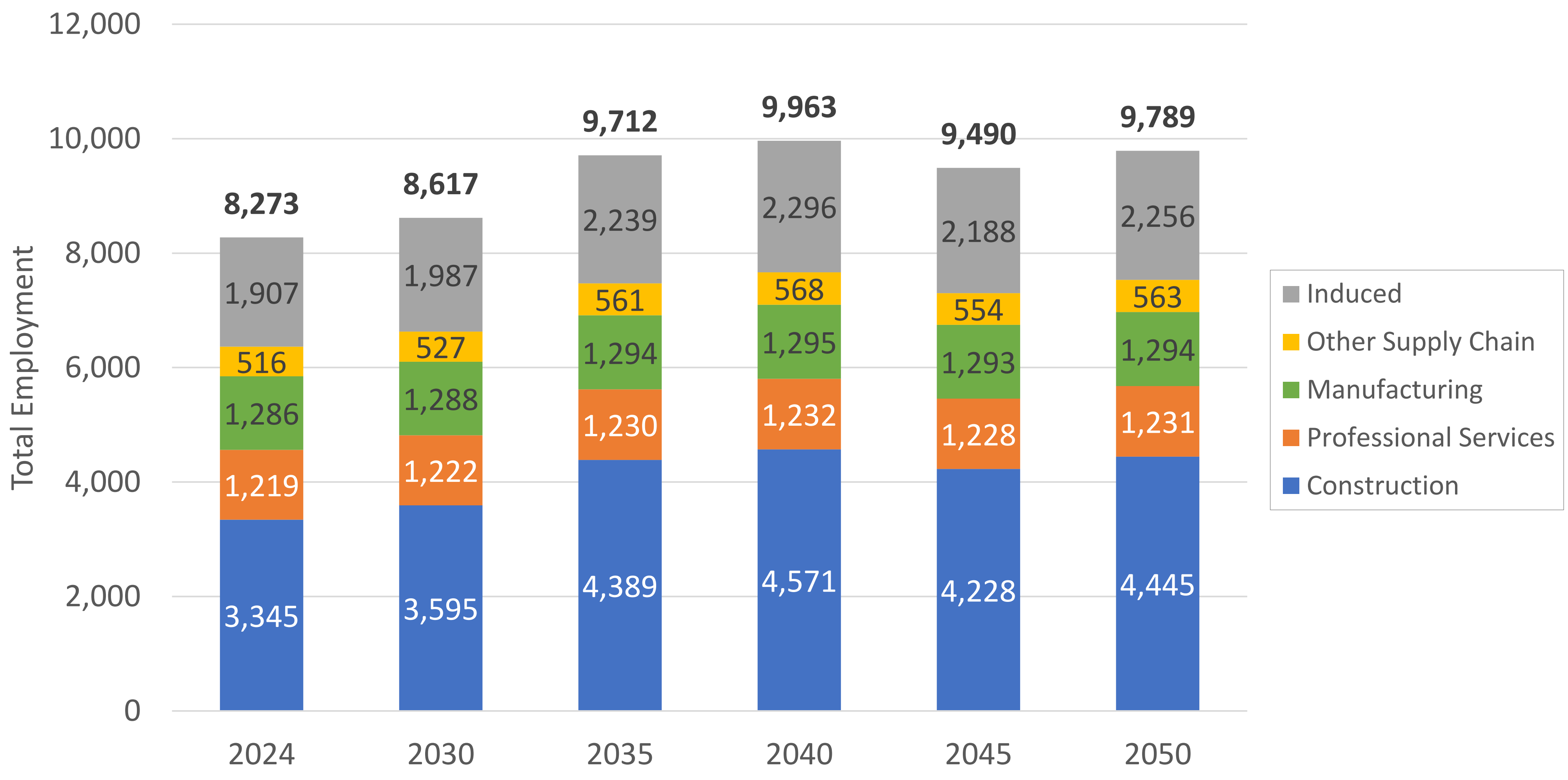



REFERENCE SCENARIO **OUTPUTS: COMMERCIAL OTHER,** OREGON
Total Employment
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
-
2024
2030
2035
2040
2045
2050
5,870
6,320
6,962
7,204
7,753
7,717
1,455
1,567
1,726
1,786
1,922
1,913
358
377
404
414
438
436
892
898
907
911
918
918
846
852
860
863
870
870
2,320
2,627
3,065
3,230
3,605
3,580
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

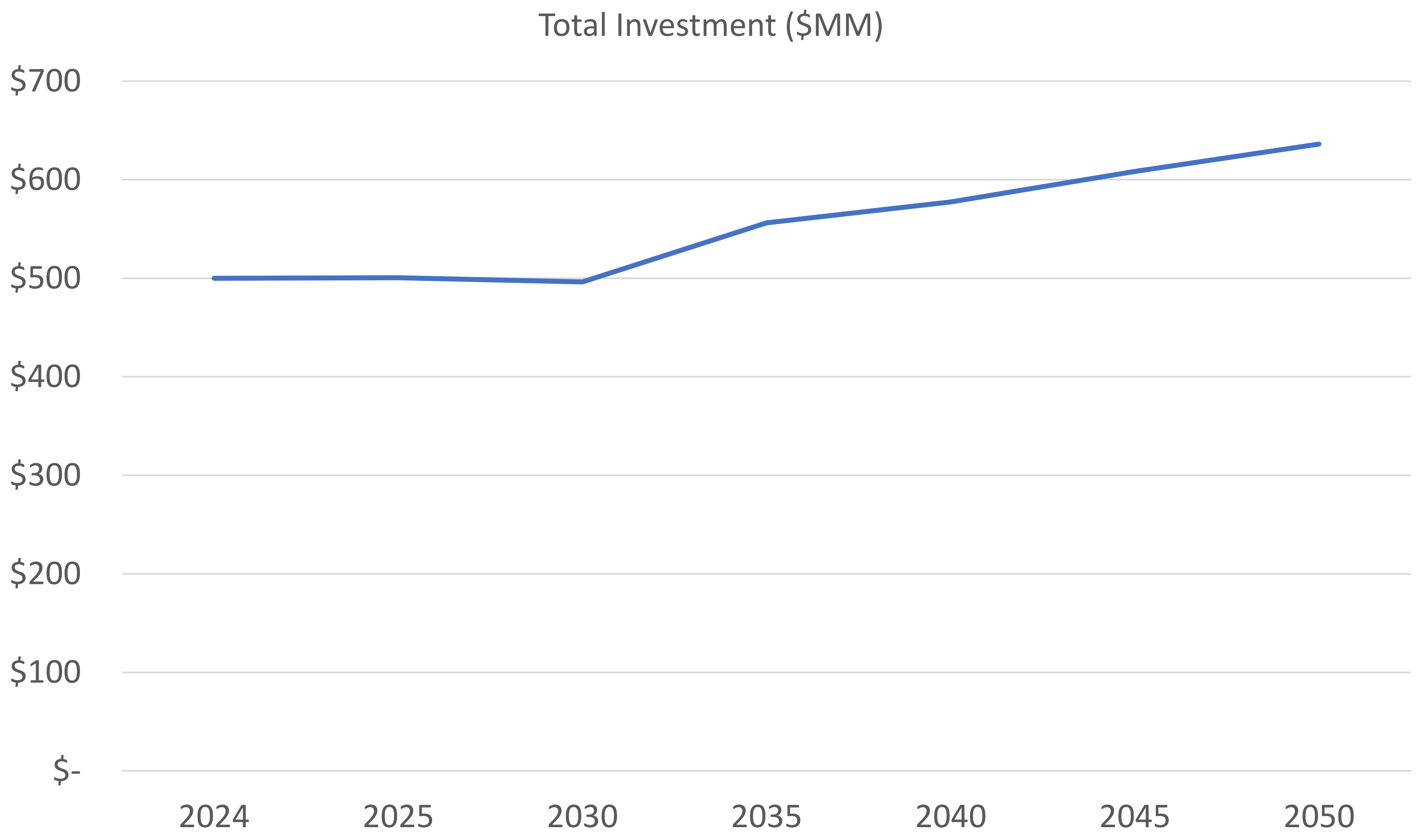
REFERENCE SCENARIO **INPUTS: RESIDENTIAL OTHER,** OREGON



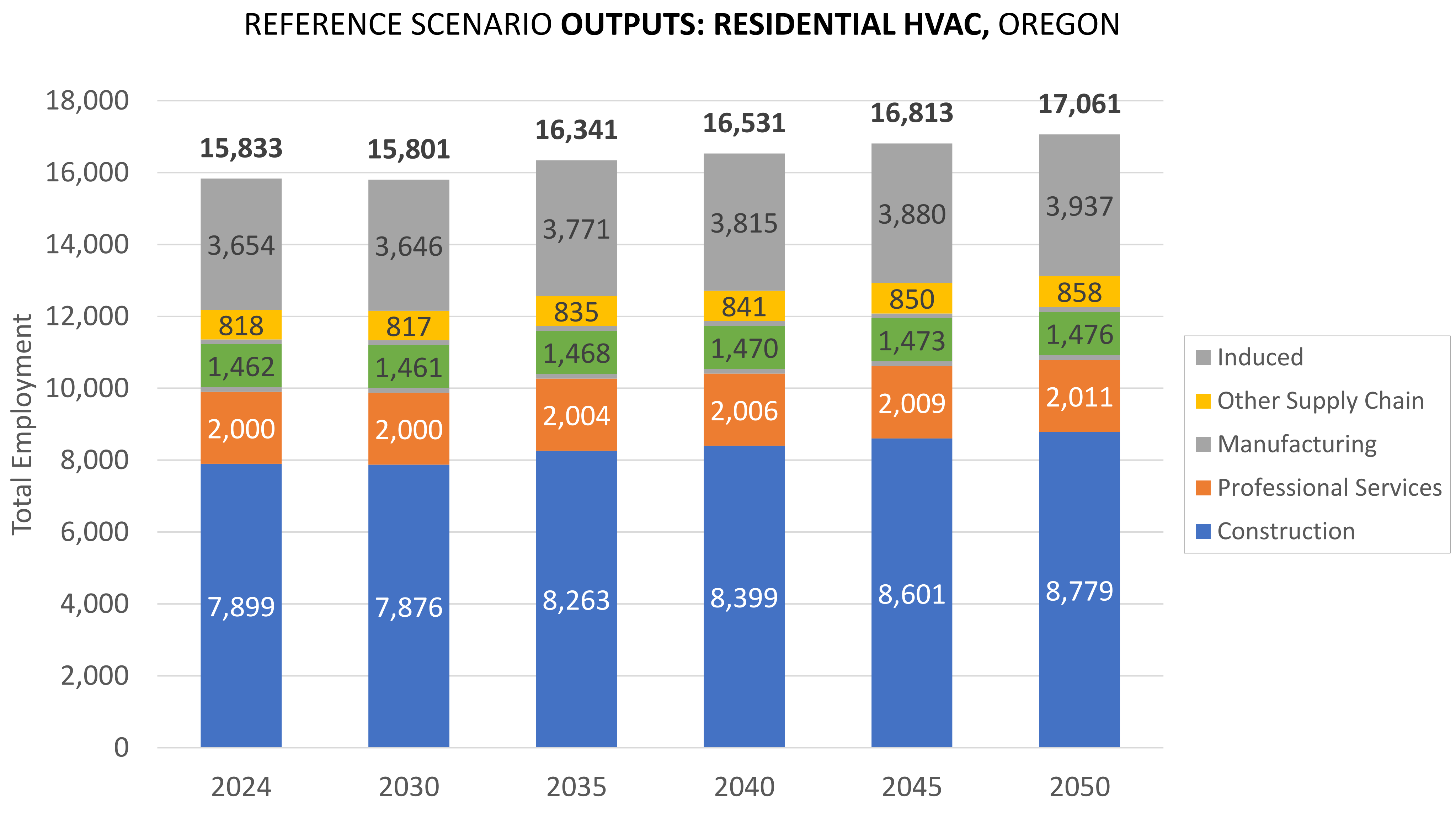
REFERENCE SCENARIO **OUTPUTS: RESIDENTIAL OTHER,** OREGON



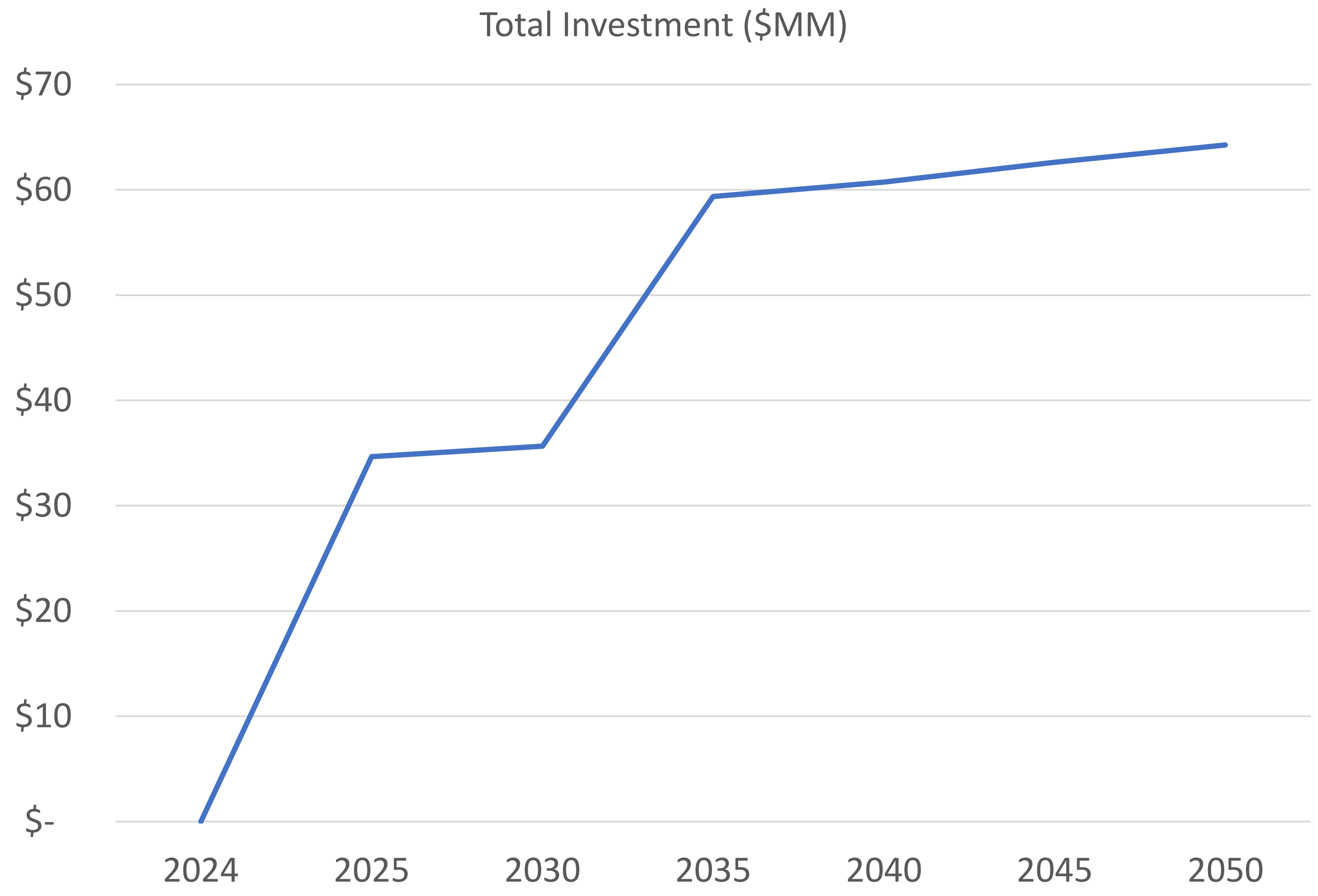
REFERENCE SCENARIO **INPUTS: RESIDENTIAL HVAC,** OREGON



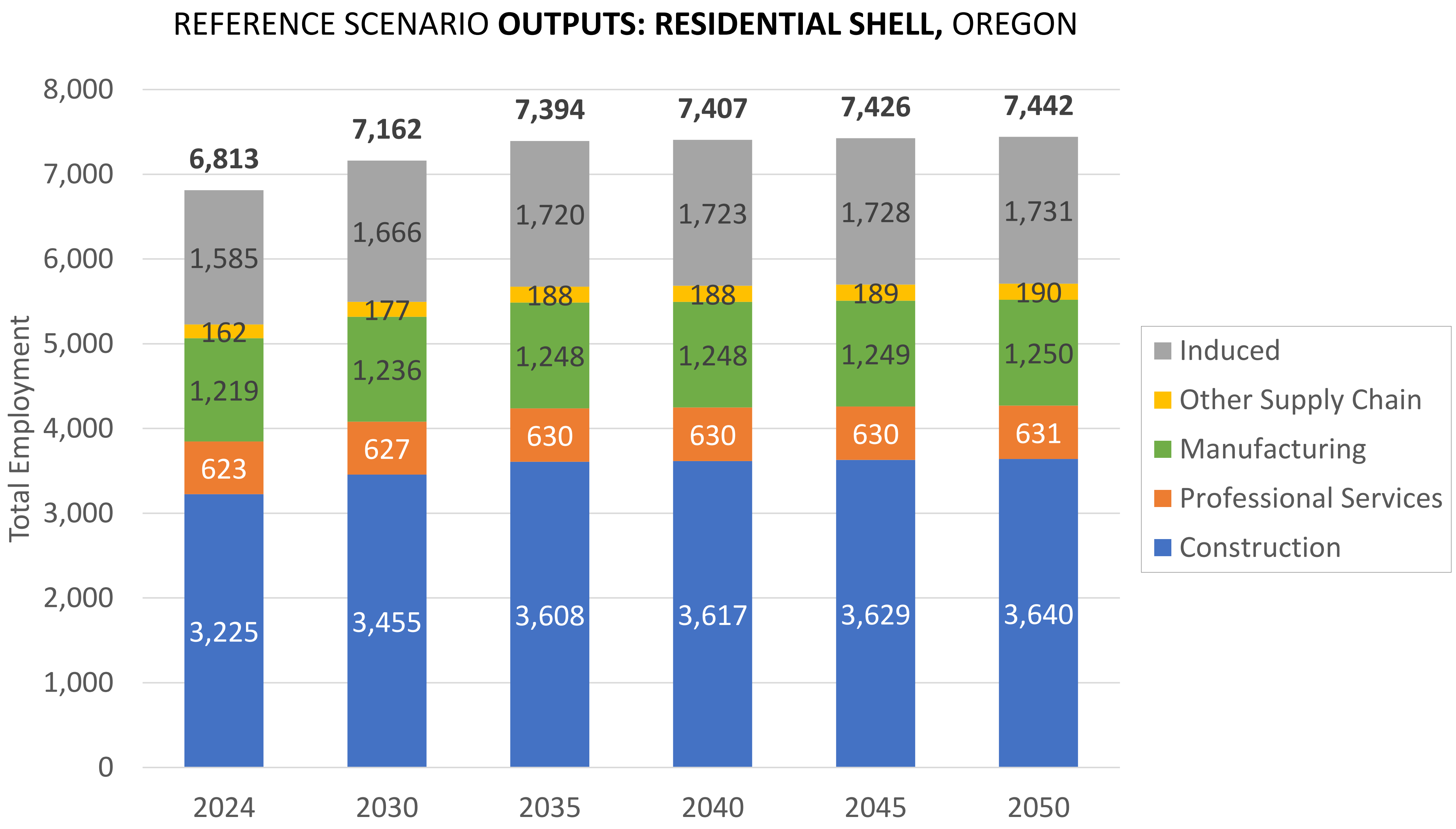
Investments in residential HVAC devices based on consumer adoption rates from EER modeling.


REFERENCE SCENARIO **OUTPUTS: RESIDENTIAL HVAC,** OREGON
Total Employment
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2024
2030
2035
2040
2045
2050
15,833
15,801
16,341
16,531
16,813
17,061
3,654
3,646
3,771
3,815
3,880
3,937
818
817
835
841
850
858
1,462
1,461
1,468
1,470
1,473
1,476
2,000
2,000
2,004
2,006
2,009
2,011
7,899
7,876
8,263
8,399
8,601
8,779
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: RESIDENTIAL SHELL,** OREGON



Residential Shell investments are incremental, so the baseline for 2024 is shown at $0. Tax credits for these retrofits roll off in 2032.

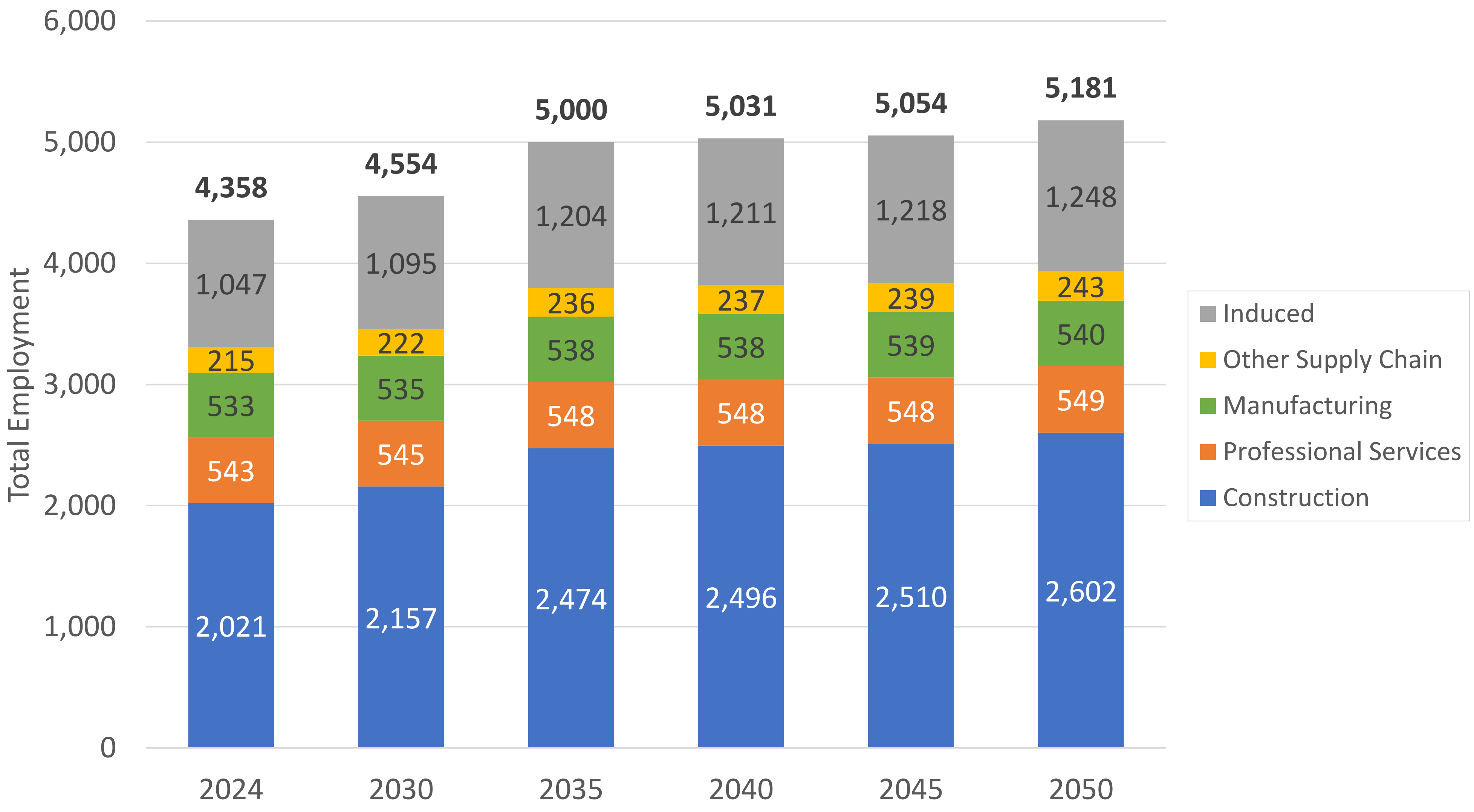

REFERENCE SCENARIO OUTPUTS: RESIDENTIAL SHELL, OREGON
Total Employment
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2024
2030
2035
2040
2045
2050
6,813
7,162
7,394
7,407
7,426
7,442
1,585
1,666
1,720
1,723
1,728
1,731
162
177
188
188
189
190
1,219
1,236
1,248
1,248
1,249
1,250
623
627
630
630
630
631
3,225
3,455
3,608
3,617
3,629
3,640
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

BUILDINGS: REFERENCE, EAST OREGON*

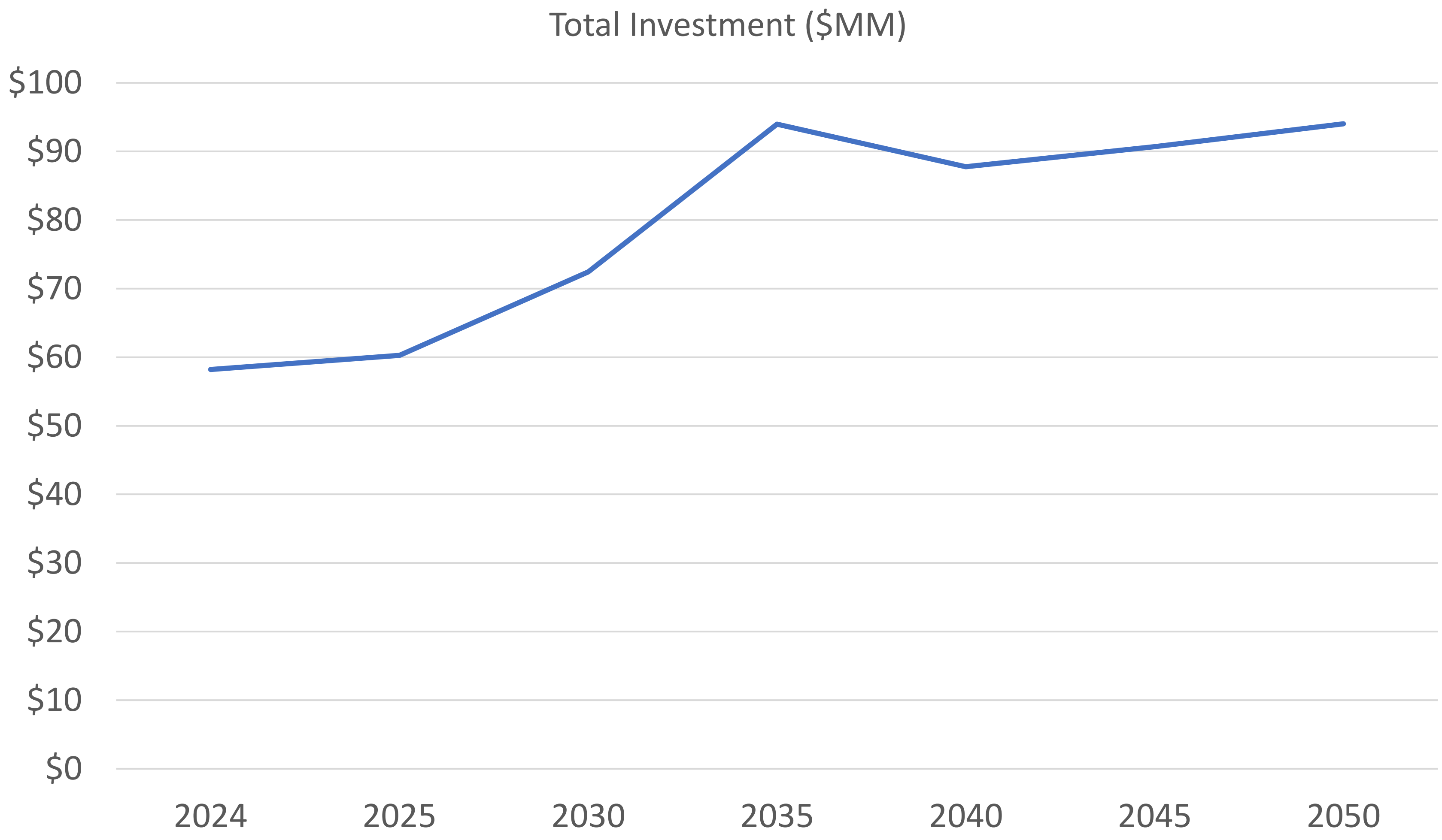
SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Commercial HVAC	1,030	1,121	1,258	1,219	1,237	1,258
Residential HVAC	1,440	1,424	1,518	1,529	1,518	1,595
Residential Shell	721	759	784	786	788	789
Commercial Other	487	542	619	649	715	710
Residential Other	680	708	821	849	797	829
Buildings OVERALL	**4,358**	**4,554**	**5,000**	**5,031**	**5,054**	**5,181**
Net Change from 2024		**196**	**642**	**672**	**696**	**823**

**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

REFERENCE SCENARIO: **BUILDINGS – TOTALS,** EAST OREGON

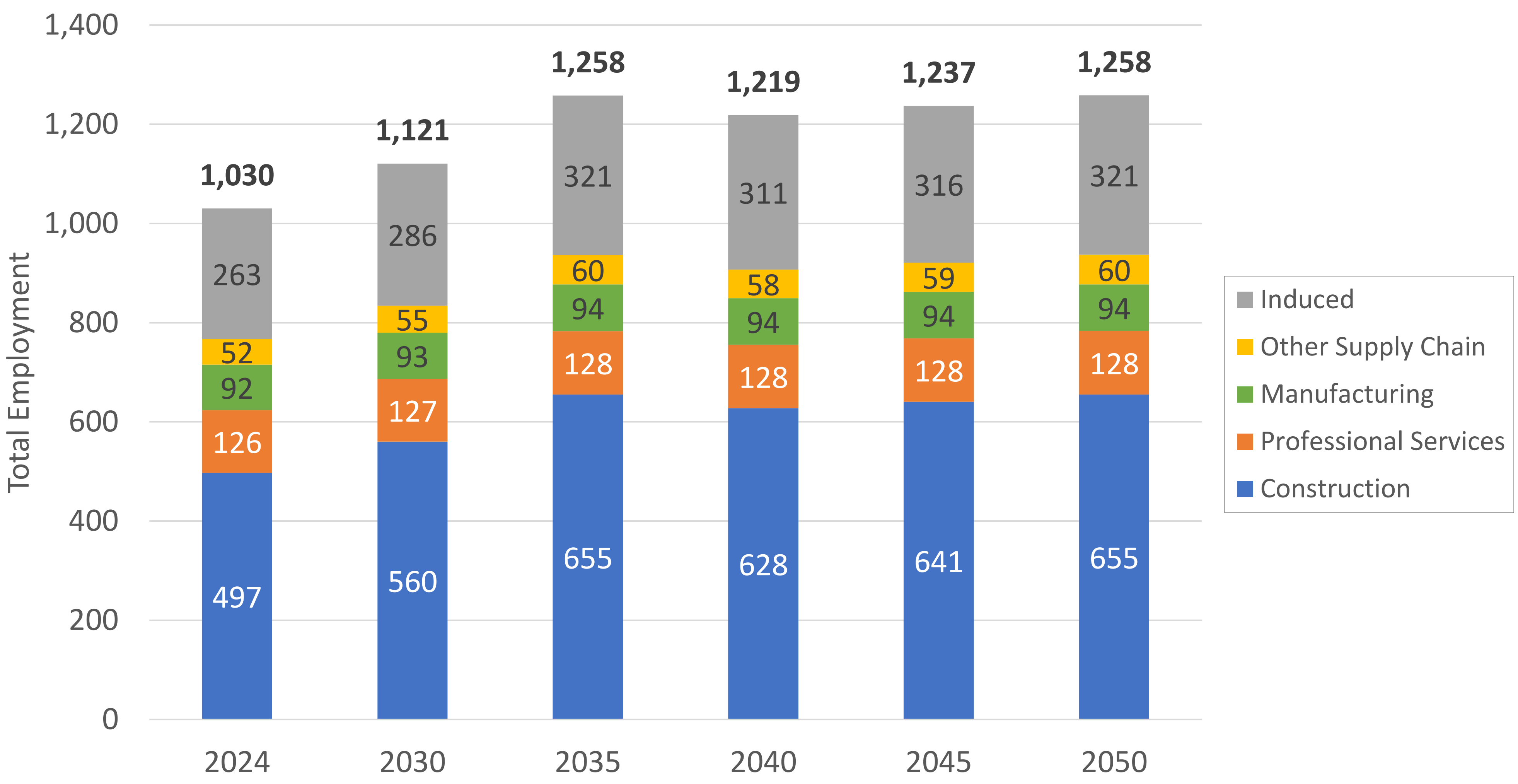


REFERENCE SCENARIO **INPUTS: COMMERCIAL HVAC**, EAST OREGON

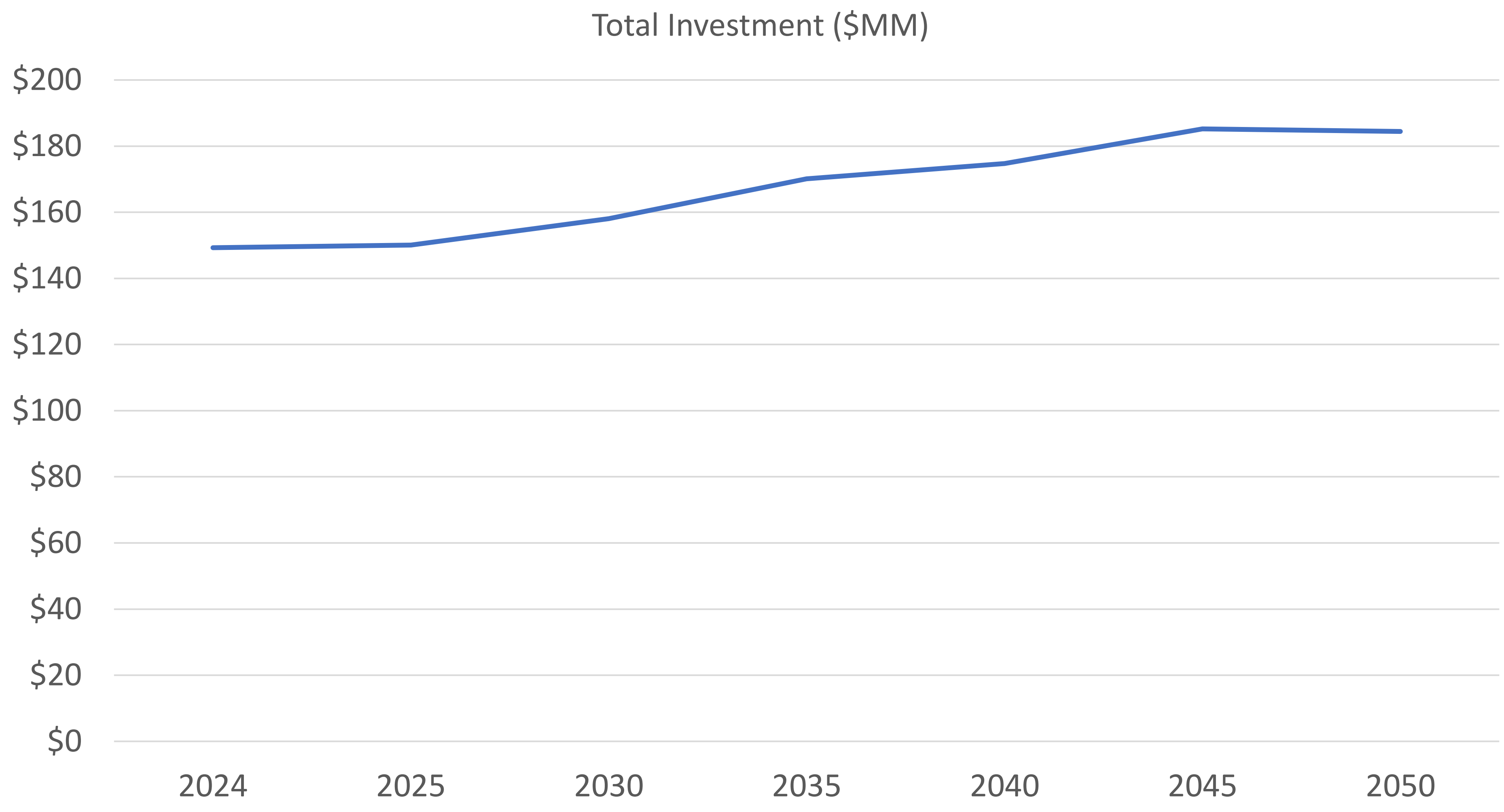


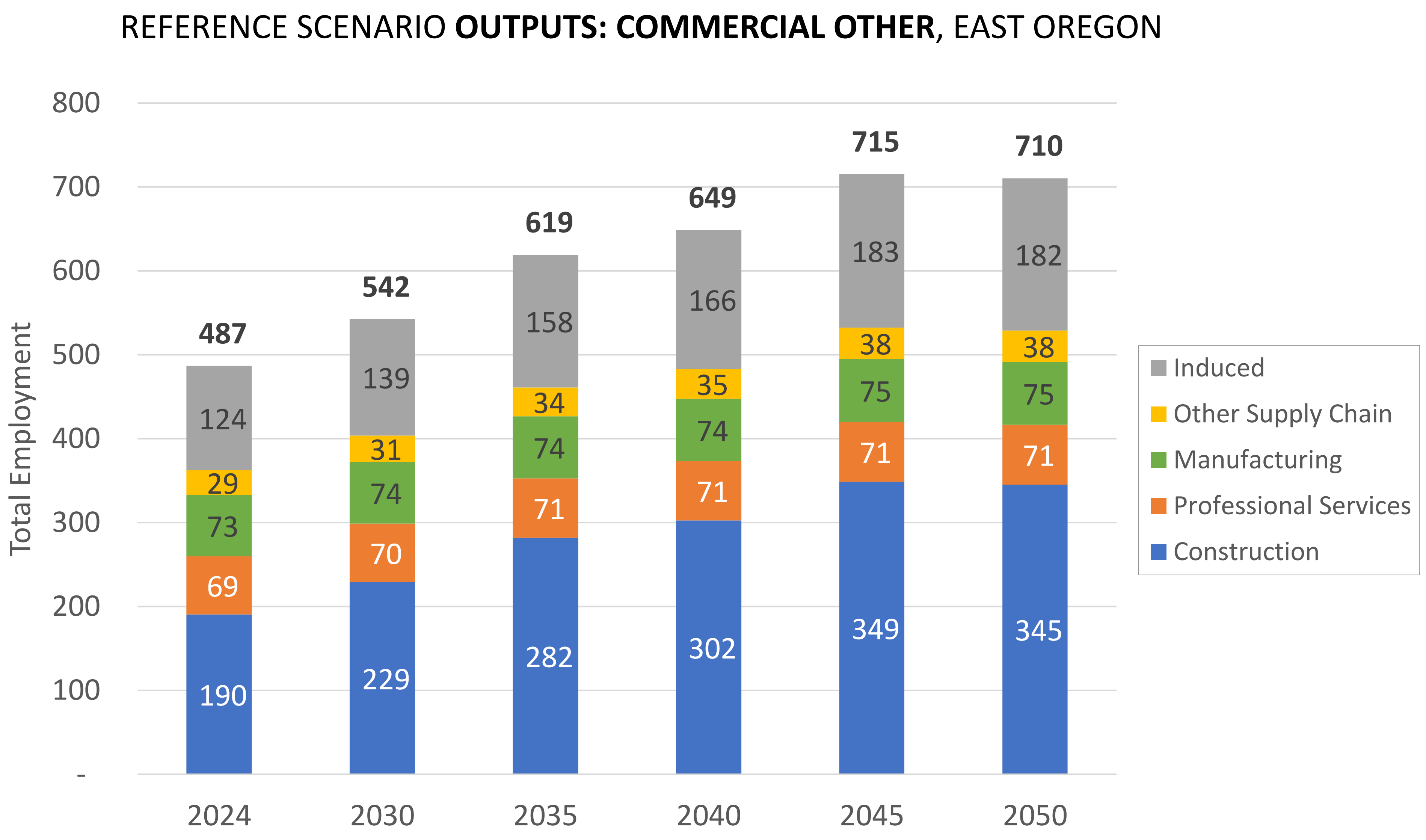
Investments in commercial HVAC devices based on consumer adoption rates from EER modeling.

REFERENCE SCENARIO **OUTPUTS: COMMERCIAL HVAC**, EAST OREGON

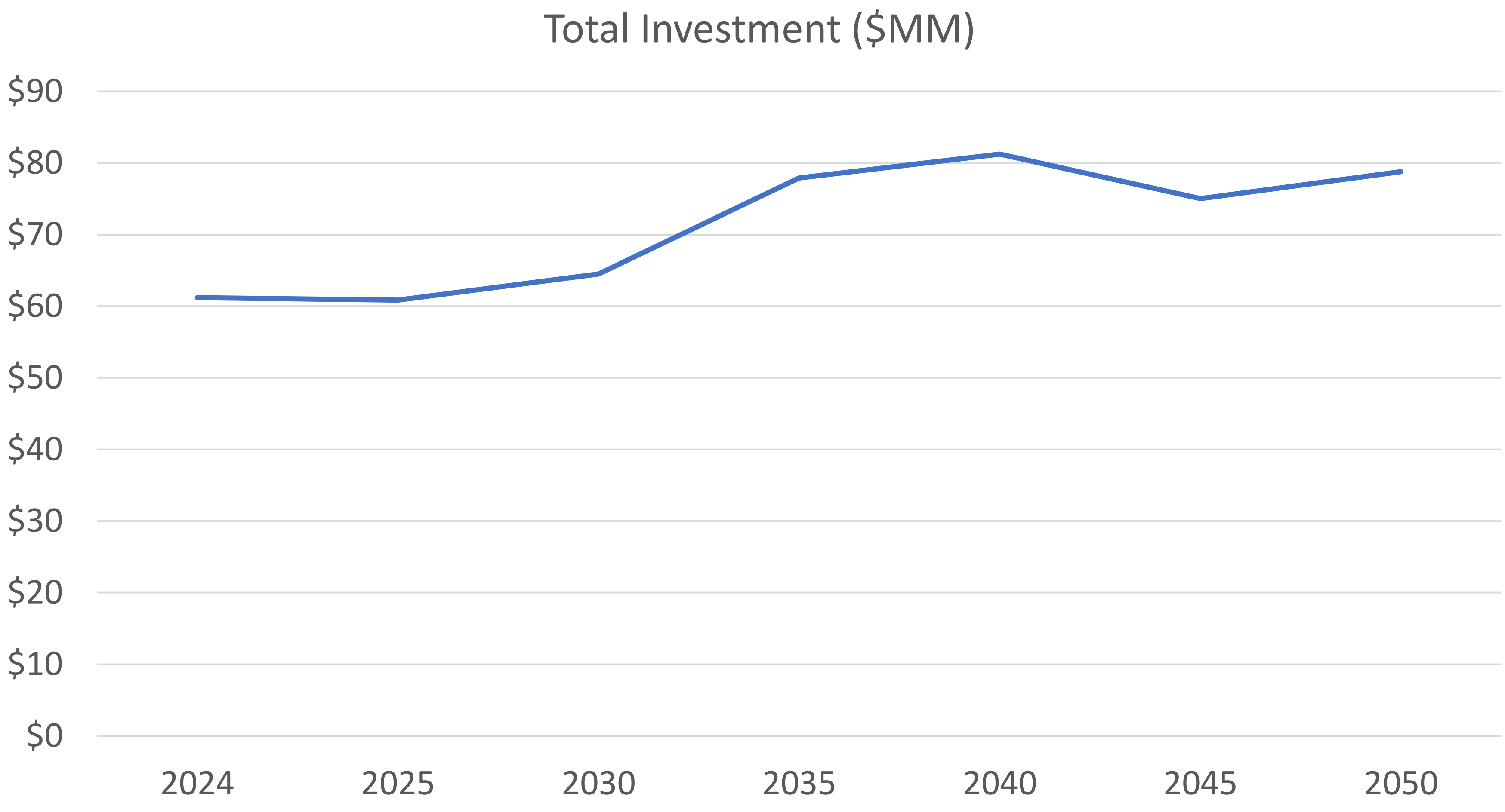


REFERENCE SCENARIO **INPUTS: COMMERCIAL OTHER**, EAST OREGON

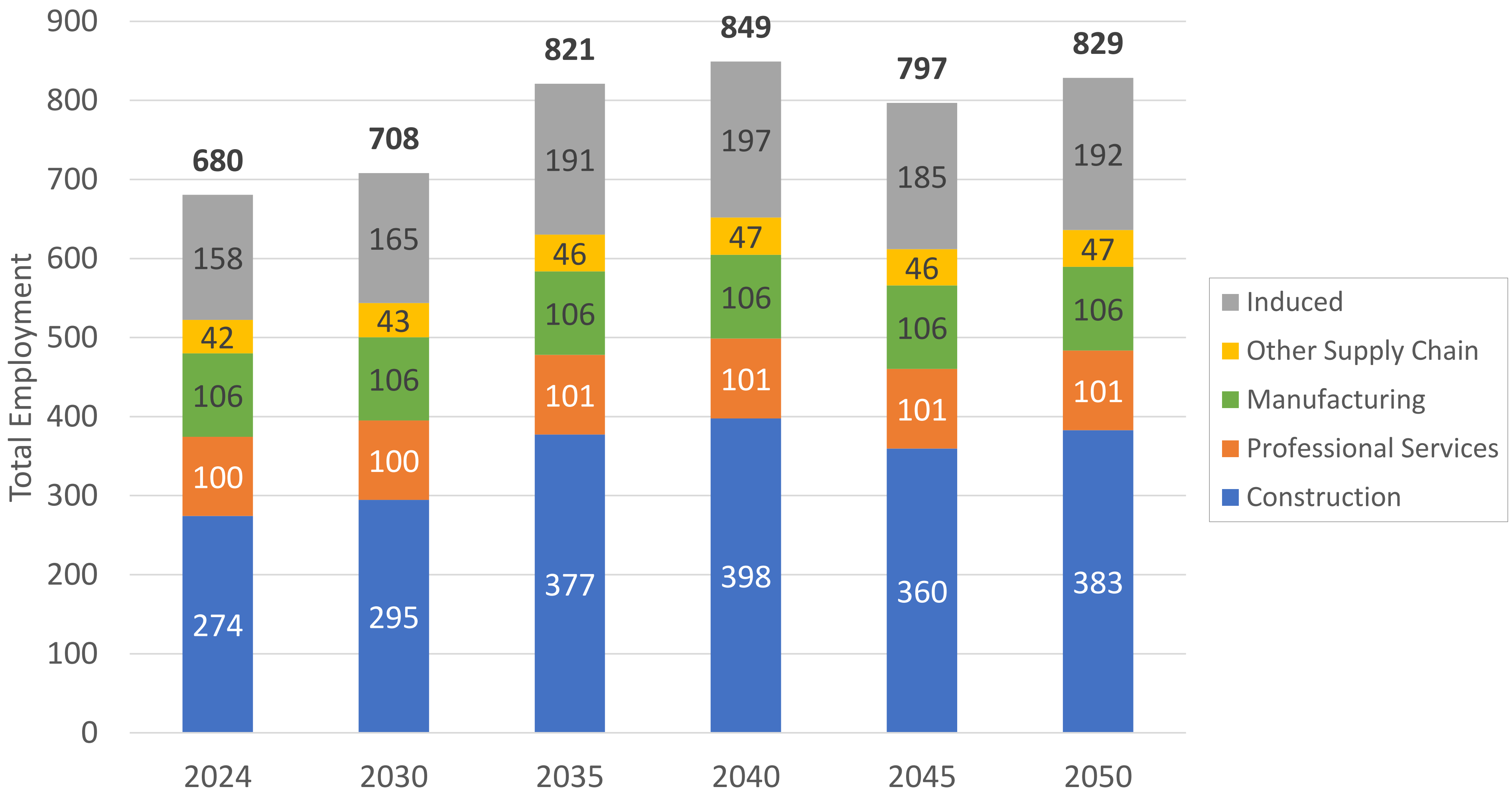



REFERENCE SCENARIO OUTPUTS: COMMERCIAL OTHER, EAST OREGON
Total Employment
800
700
600
500
400
300
200
100
-
2024
2030
2035
2040
2045
2050
487
542
619
649
715
710
124
139
158
166
183
182
29
31
34
35
38
38
73
74
74
74
75
75
69
70
71
71
71
71
190
229
282
302
349
345
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

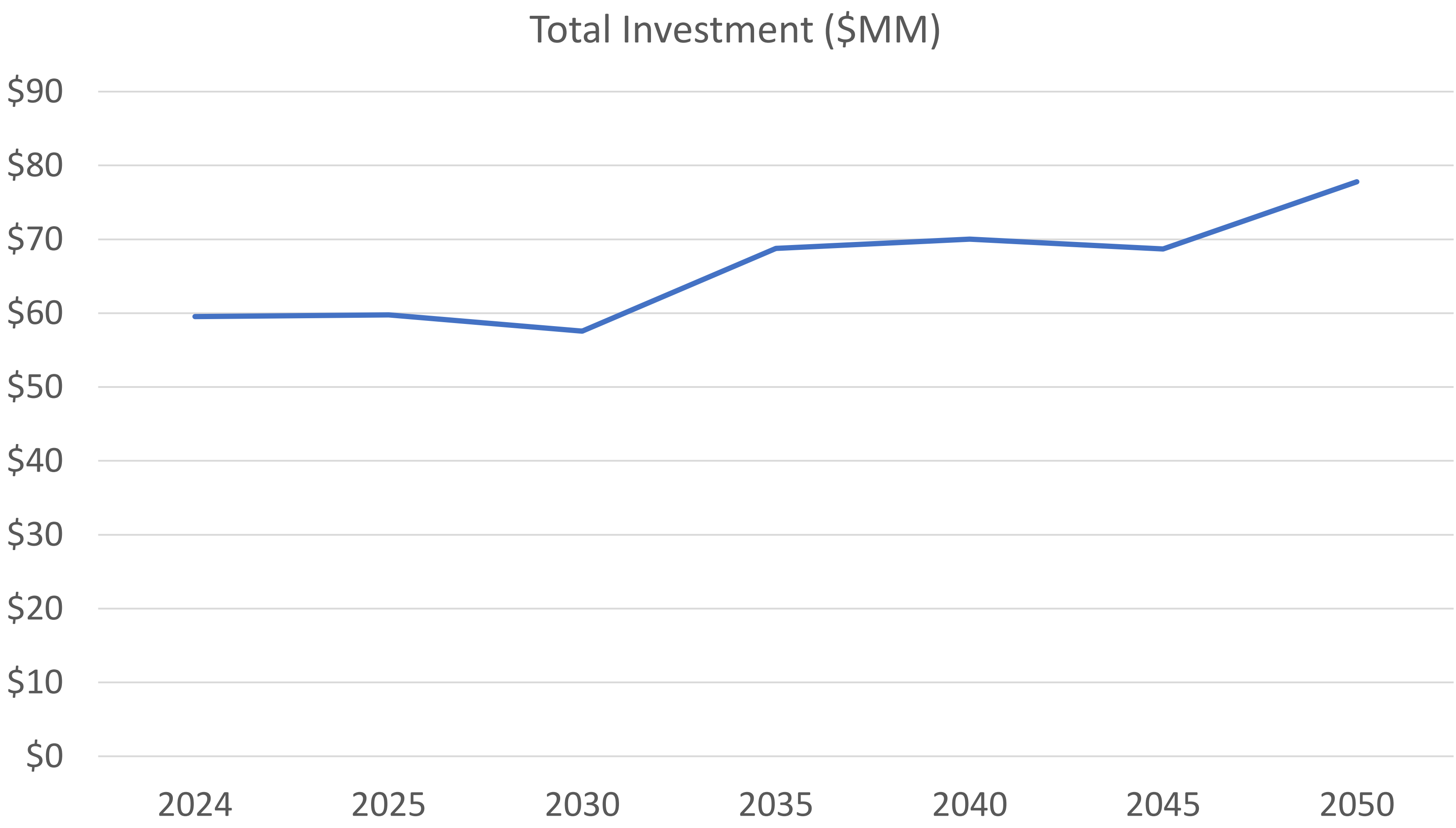
REFERENCE SCENARIO **INPUTS: RESIDENTIAL OTHER**, EAST OREGON



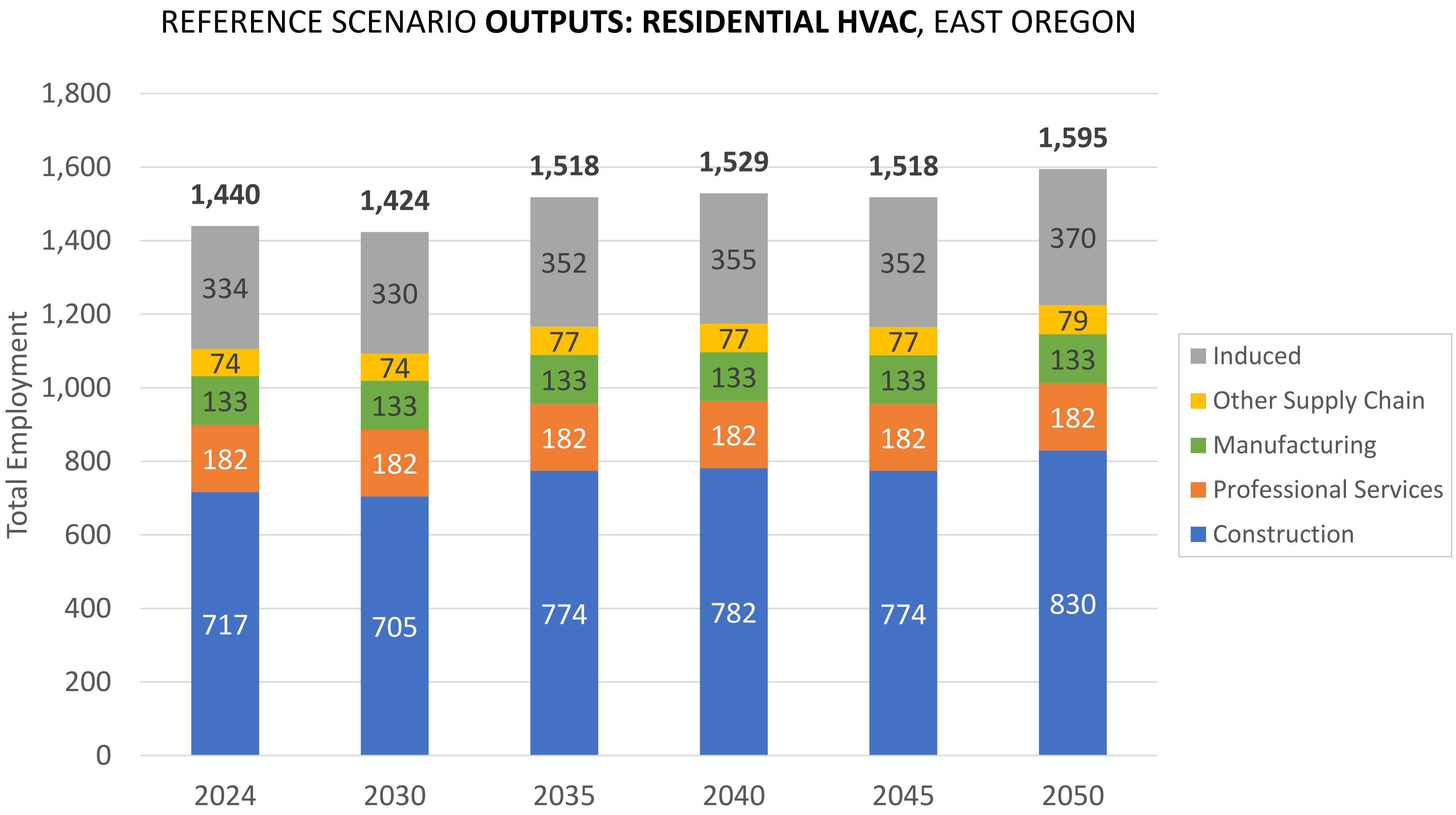
REFERENCE SCENARIO **OUTPUTS: RESIDENTIAL OTHER**, EAST OREGON



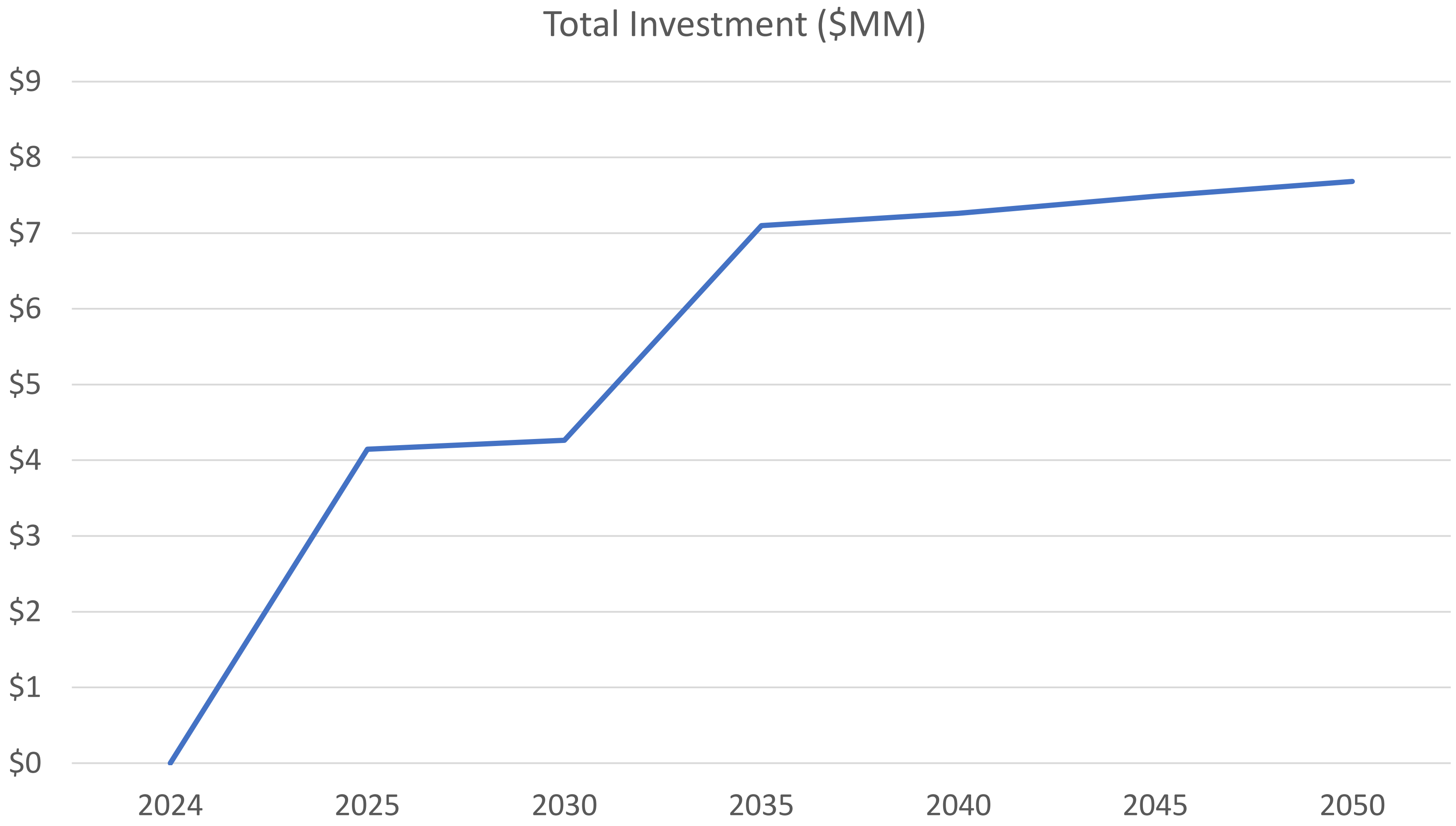
REFERENCE SCENARIO **INPUTS: RESIDENTIAL HVAC**, EAST OREGON



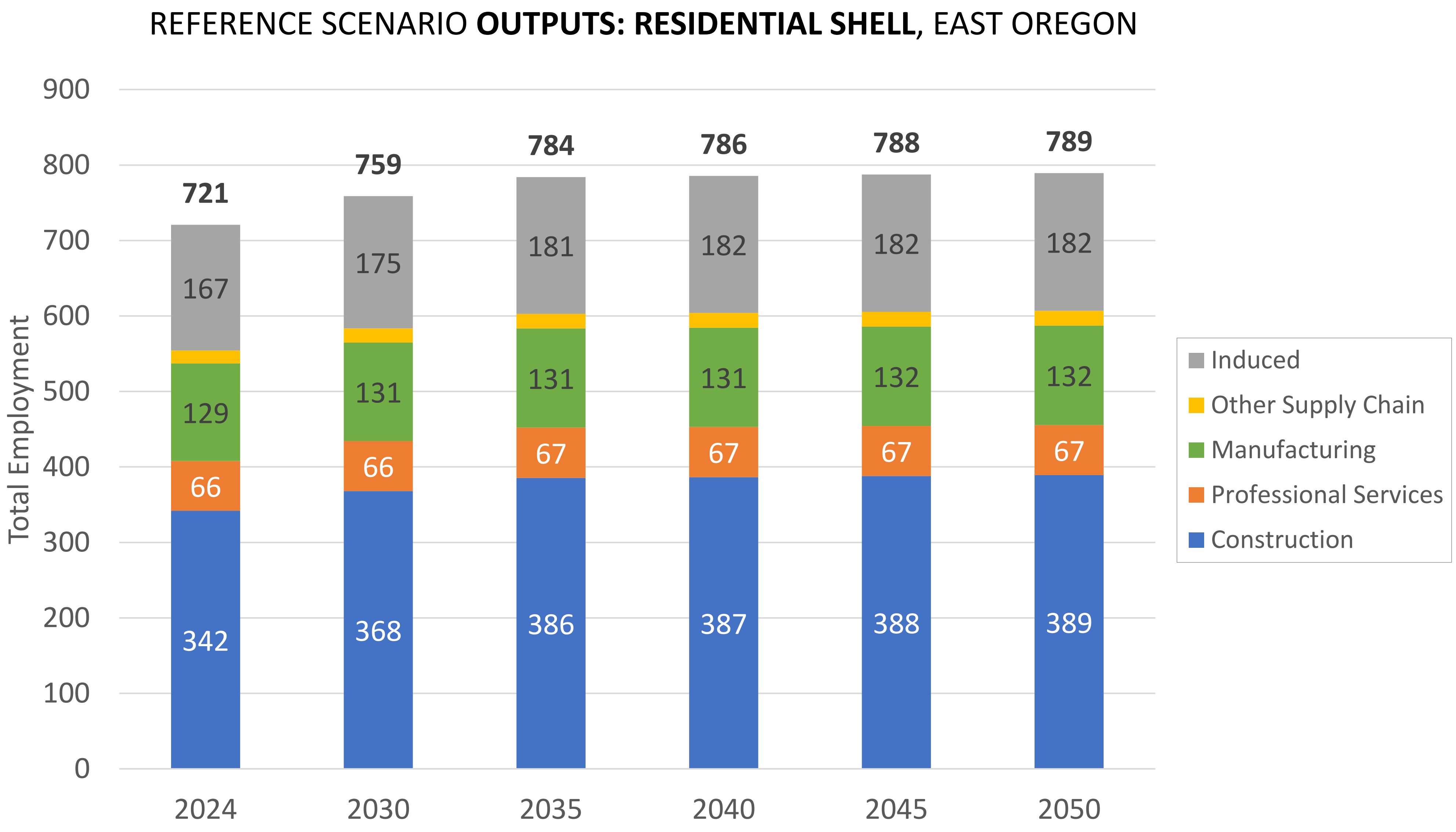
Investments in residential HVAC devices based on consumer adoption rates from EER modeling.


REFERENCE SCENARIO OUTPUTS: RESIDENTIAL HVAC, EAST OREGON
Total Employment
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2024
2030
2035
2040
2045
2050
1,440
1,424
1,518
1,529
1,518
1,595
334
330
352
355
352
370
74
74
77
77
77
79
133
133
133
133
133
133
182
182
182
182
182
182
717
705
774
782
774
830
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: RESIDENTIAL SHELL**, EAST OREGON



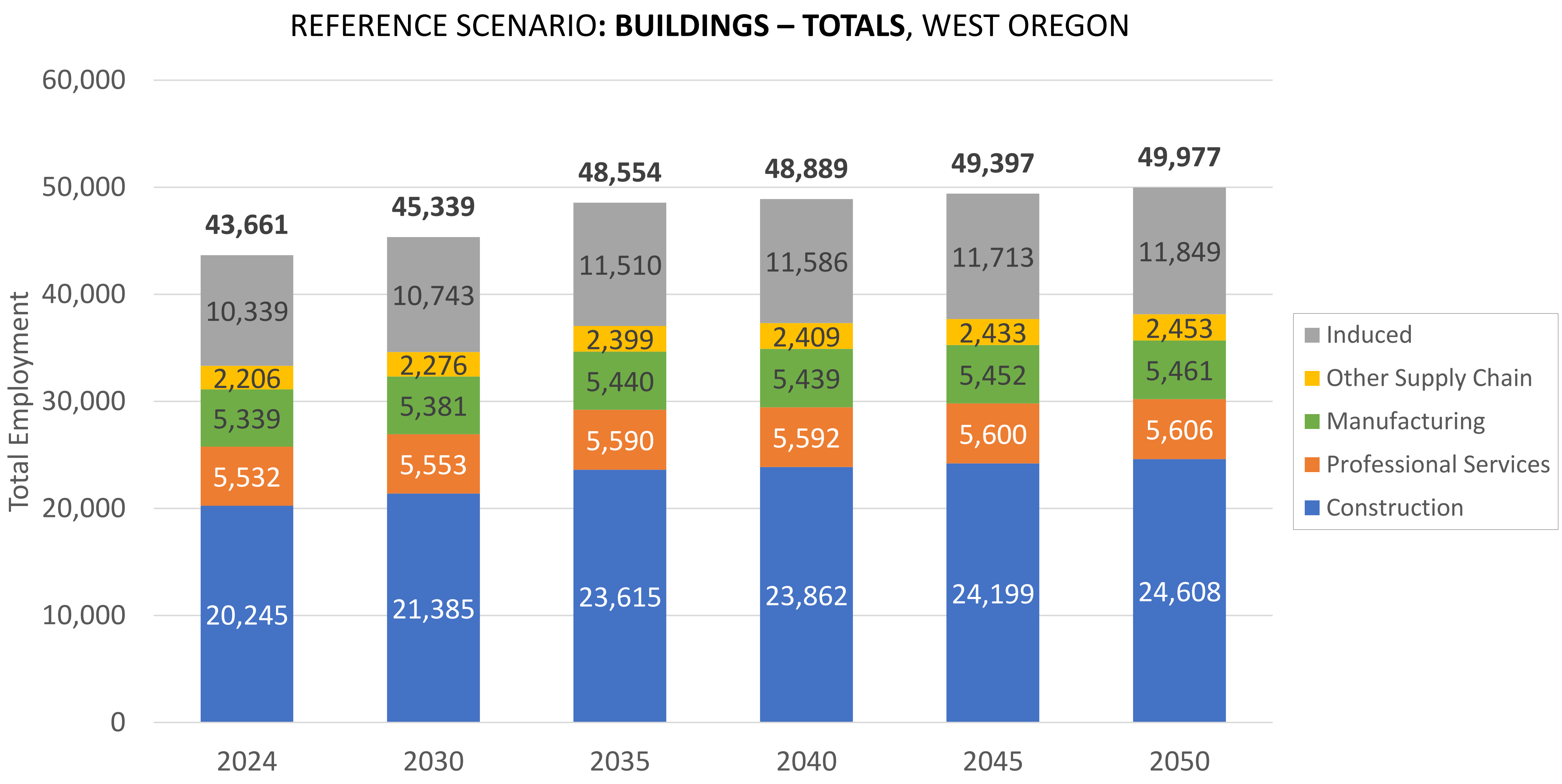
Residential Shell investments are incremental, so the baseline for 2024 is shown at $0. Tax credits for these retrofits roll off in 2032.


REFERENCE SCENARIO OUTPUTS: RESIDENTIAL SHELL, EAST OREGON
Total Employment
900
800
700
600
500
400
300
200
100
0
2024
2030
2035
2040
2045
2050
721
759
784
786
788
789
167
175
181
182
182
182
129
131
131
131
132
132
66
66
67
67
67
67
342
368
386
387
388
389
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

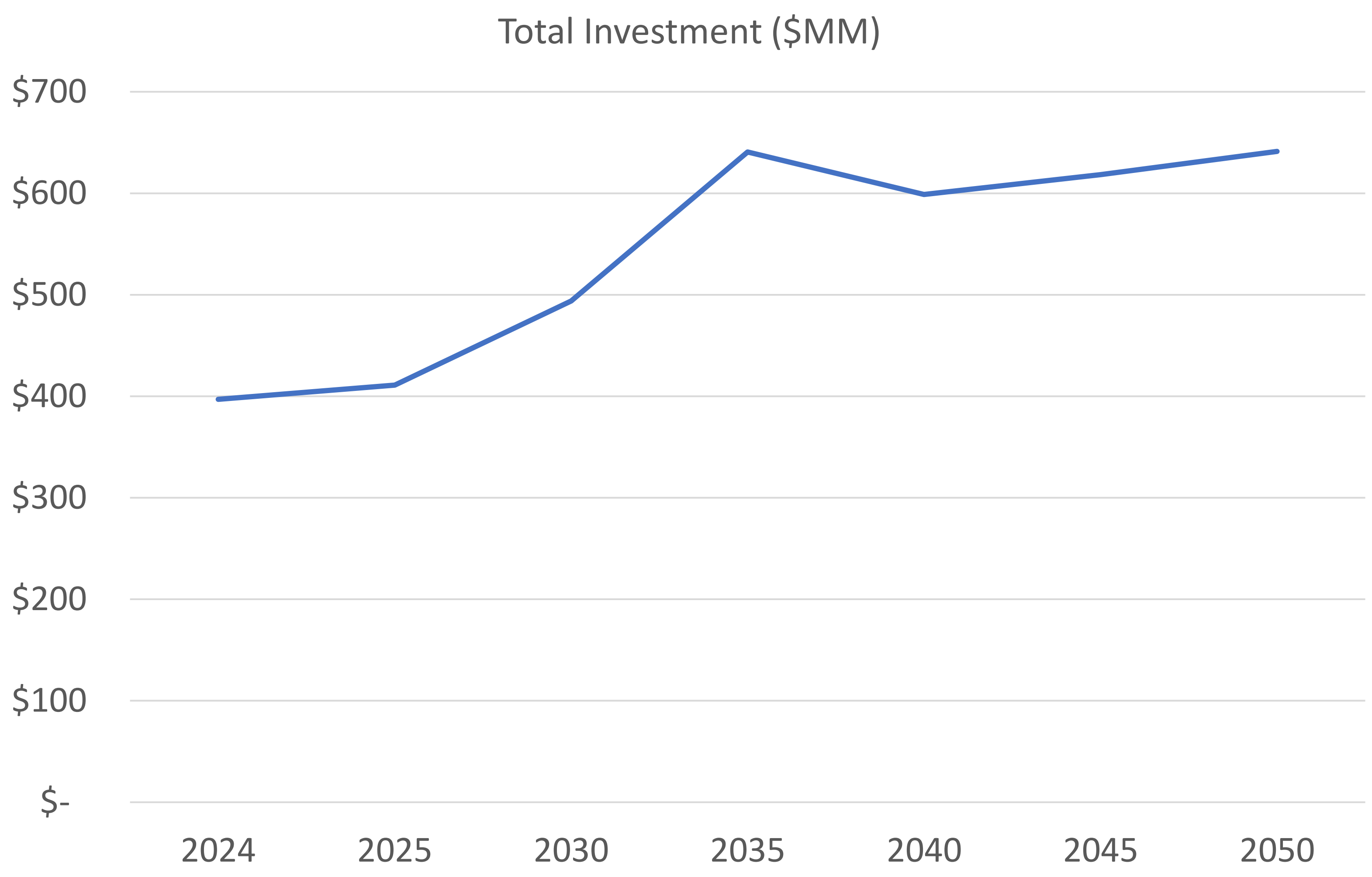
REFERENCE SCENARIO: **BUILDINGS**, WEST OREGON*

SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Commercial HVAC	10,200	10,871	11,887	11,596	11,733	11,890
Residential HVAC	14,392	14,377	14,823	15,002	15,295	15,467
Residential Shell	6,092	6,403	6,610	6,622	6,638	6,652
Commercial Other	5,384	5,778	6,343	6,555	7,038	7,006
Residential Other	7,593	7,909	8,891	9,114	8,693	8,961
Buildings OVERALL	**43,661**	**45,339**	**48,554**	**48,889**	**49,397**	**49,977**
Net Change from 2024		**1,678**	**4,893**	**5,228**	**5,737**	**6,316**

**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

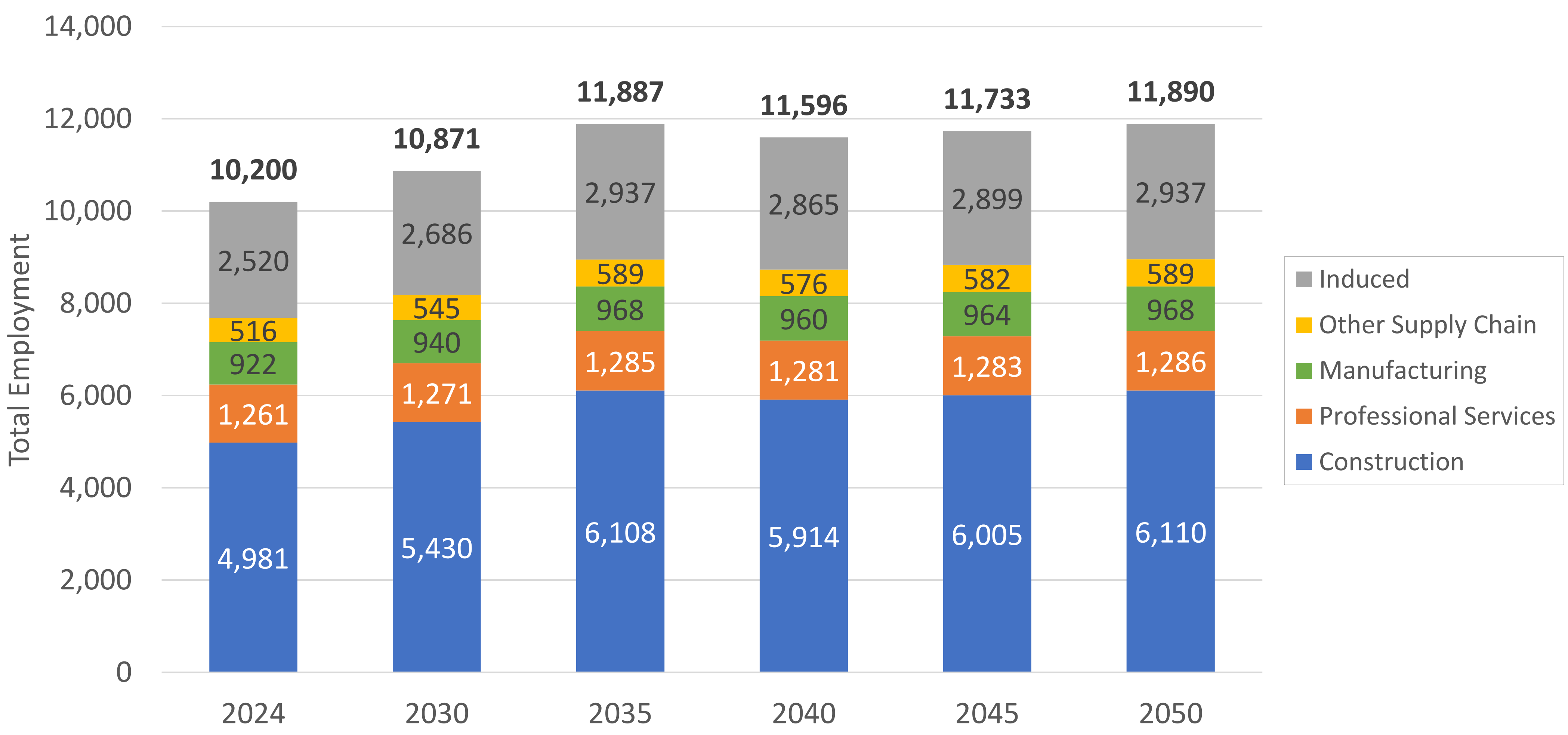

REFERENCE SCENARIO: BUILDINGS – TOTALS, WEST OREGON
Total Employment
60,000
50,000
40,000
30,000
20,000
10,000
0
2024
2030
2035
2040
2045
2050
43,661
45,339
48,554
48,889
49,397
49,977
10,339
10,743
11,510
11,586
11,713
11,849
2,206
2,276
2,399
2,409
2,433
2,453
5,339
5,381
5,440
5,439
5,452
5,461
5,532
5,553
5,590
5,592
5,600
5,606
20,245
21,385
23,615
23,862
24,199
24,608
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: COMMERCIAL HVAC**, WEST OREGON

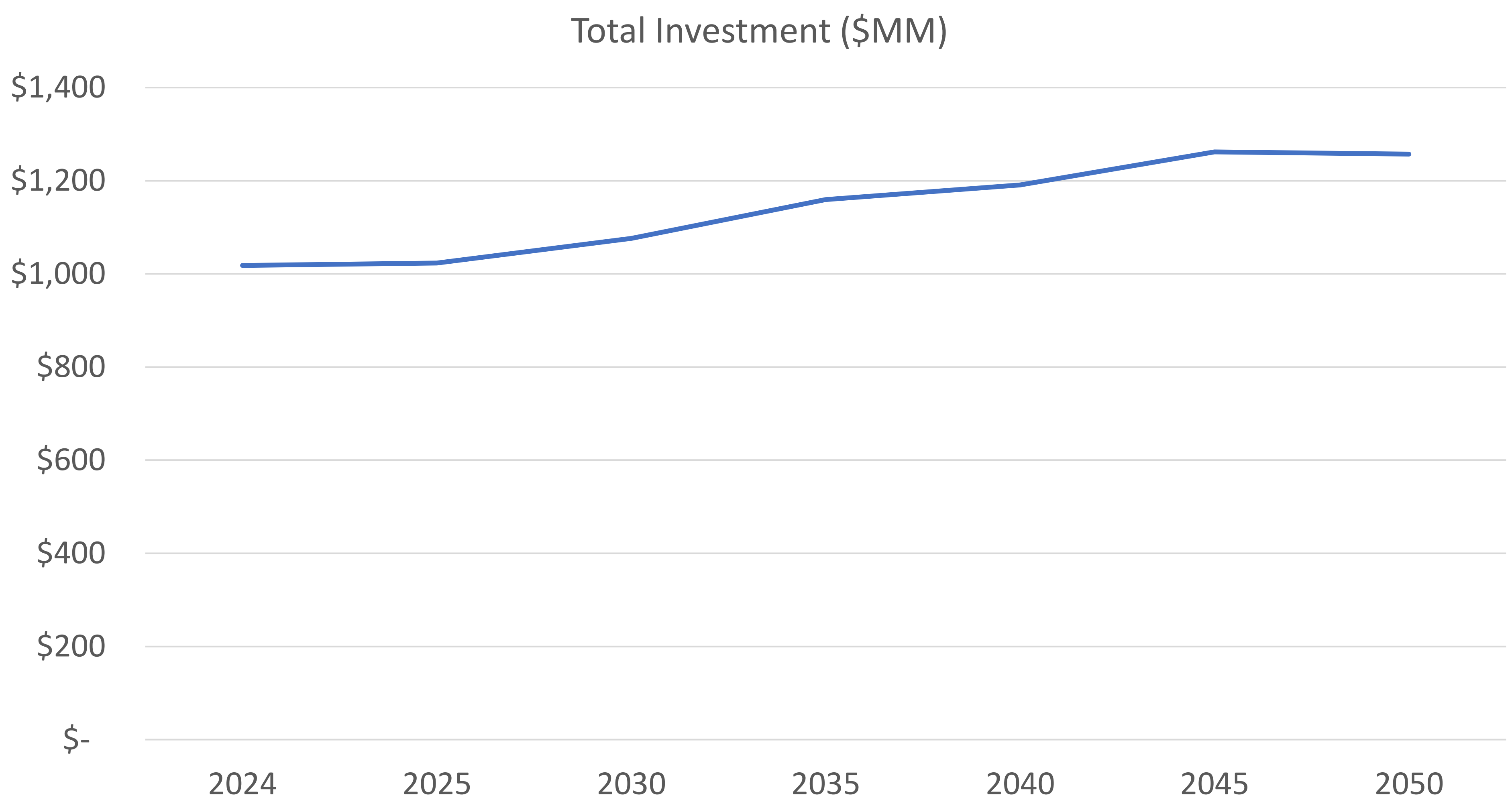


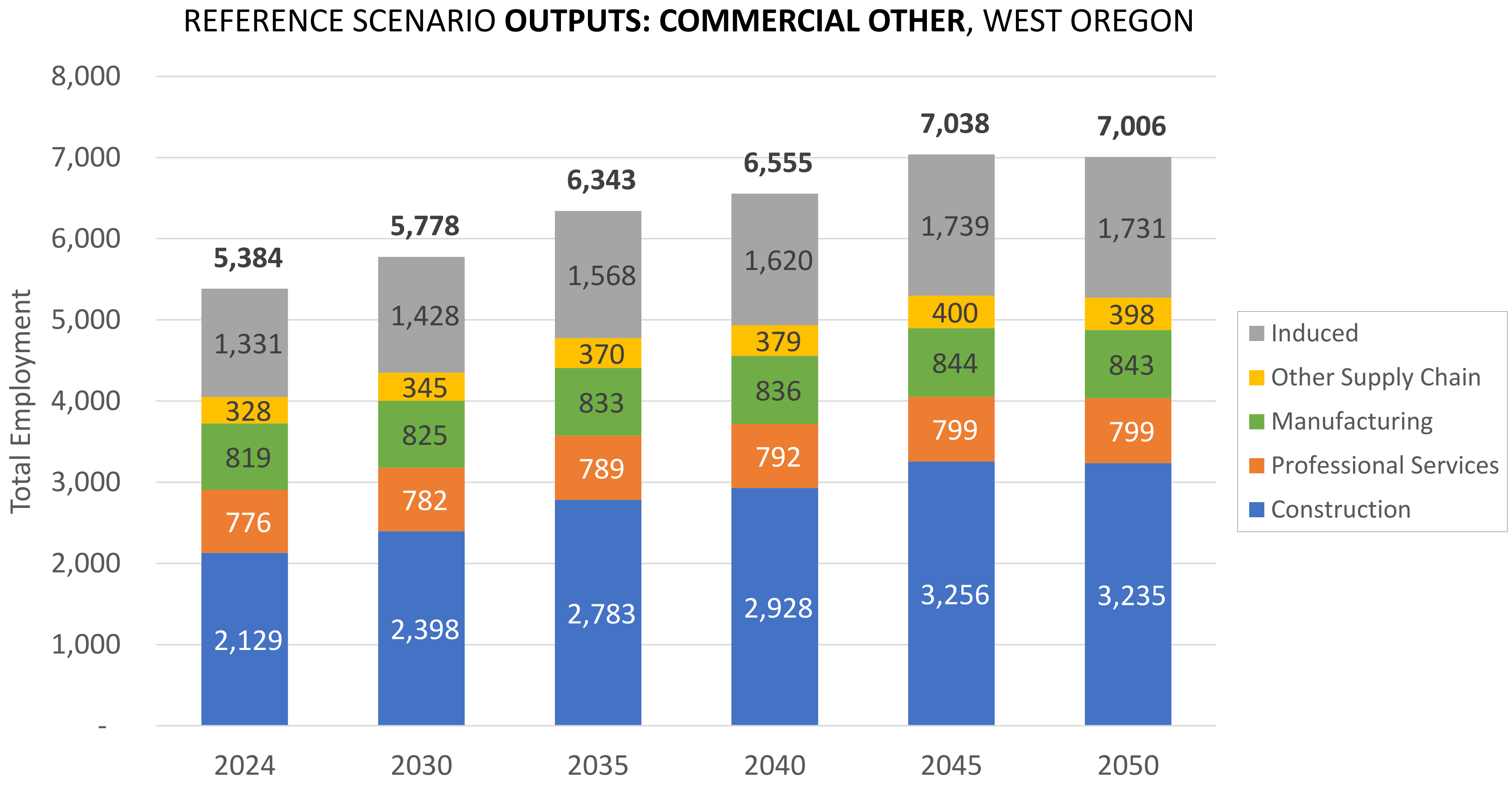
Investments in commercial HVAC devices based on consumer adoption rates from EER modeling.

REFERENCE SCENARIO **OUTPUTS: COMMERCIAL HVAC**, WEST OREGON

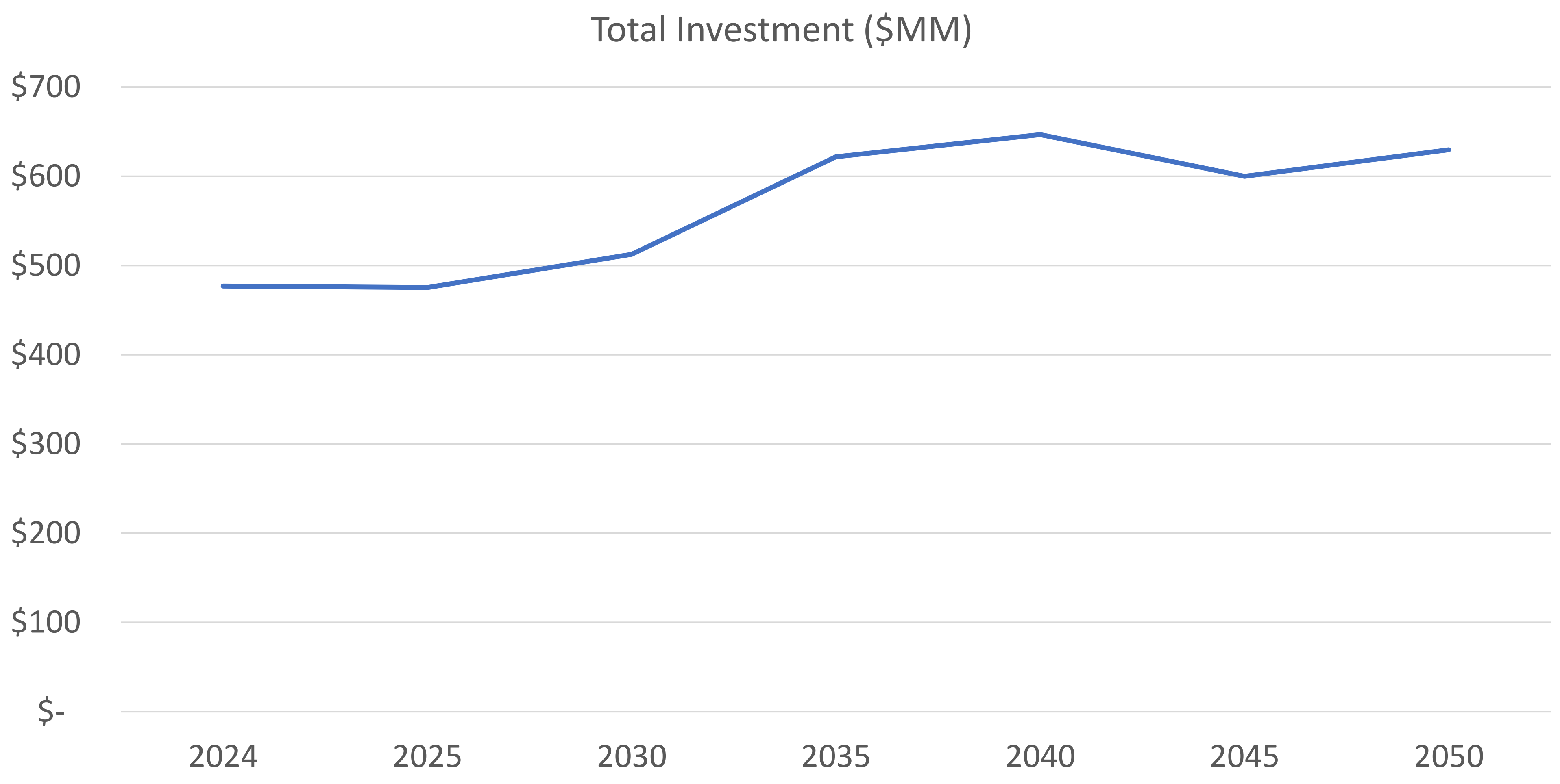


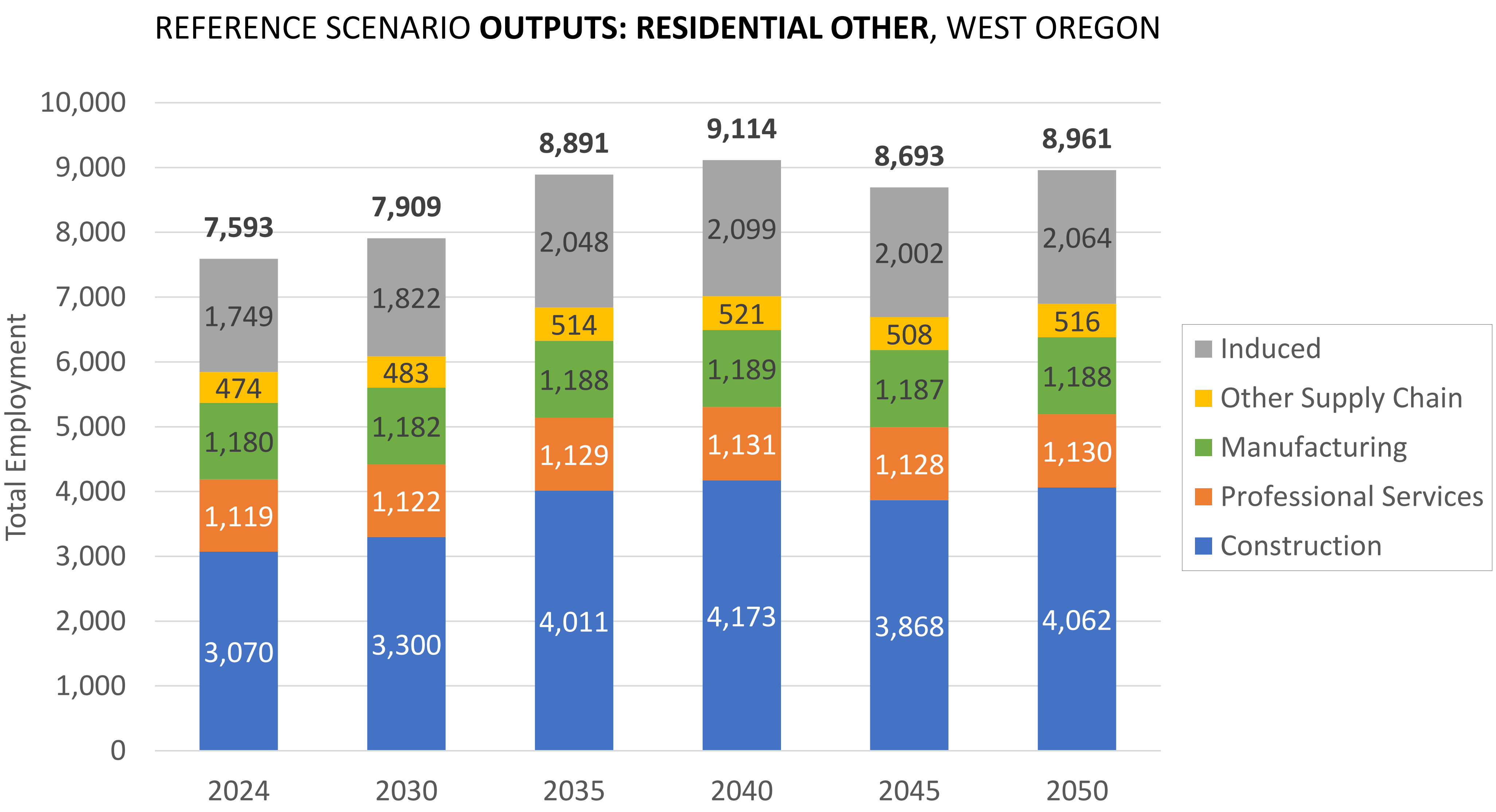
REFERENCE SCENARIO **INPUTS: COMMERCIAL OTHER**, WEST OREGON



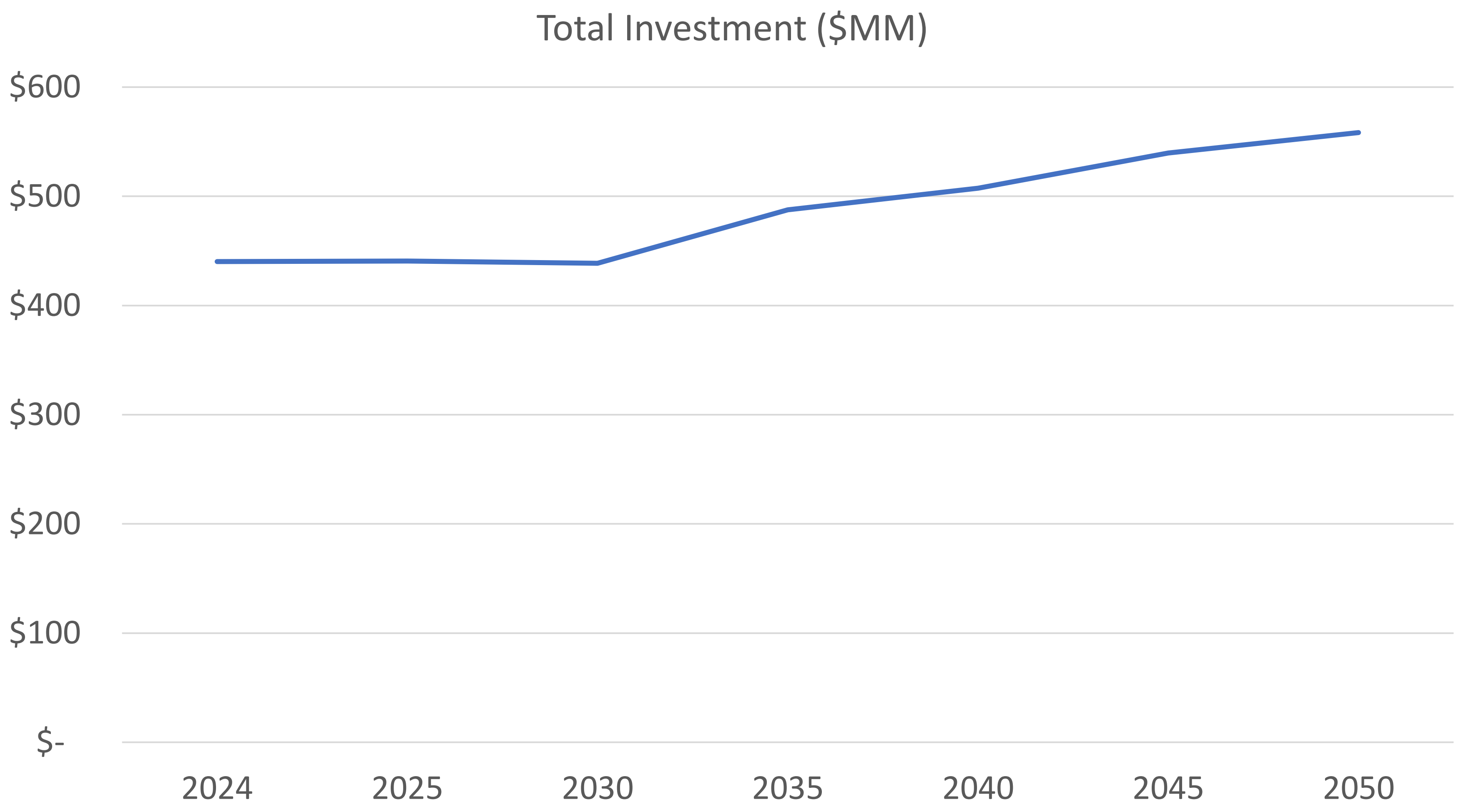

REFERENCE SCENARIO OUTPUTS: COMMERCIAL OTHER, WEST OREGON
Total Employment
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
-
2024
2030
2035
2040
2045
2050
5,384
5,778
6,343
6,555
7,038
7,006
1,331
1,428
1,568
1,620
1,739
1,731
328
345
370
379
400
398
819
825
833
836
844
843
776
782
789
792
799
799
2,129
2,398
2,783
2,928
3,256
3,235
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: RESIDENTIAL OTHER**, WEST OREGON

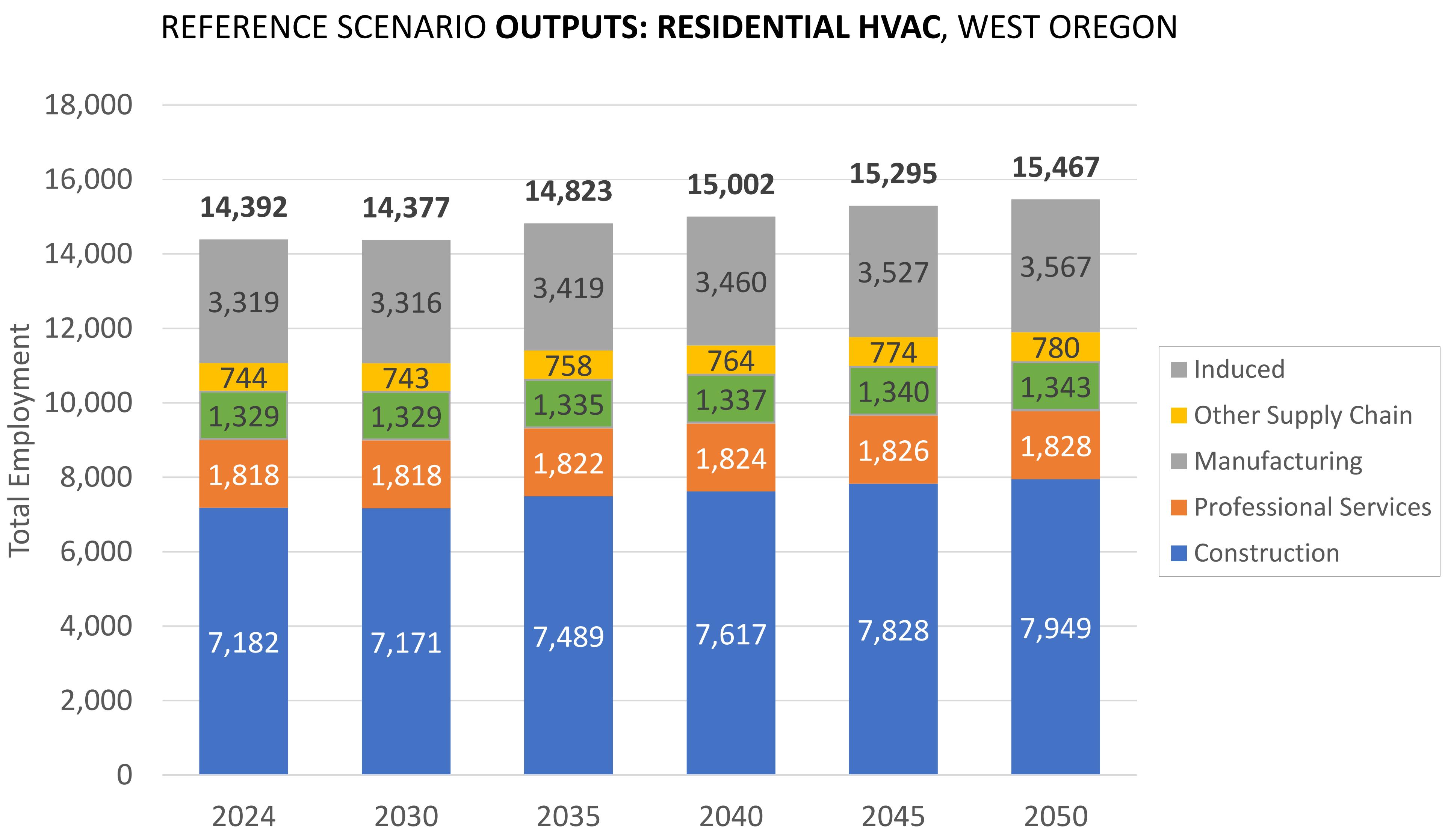



REFERENCE SCENARIO **OUTPUTS: RESIDENTIAL OTHER**, WEST OREGON
Total Employment
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2024
2030
2035
2040
2045
2050
7,593
7,909
8,891
9,114
8,693
8,961
1,749
1,822
2,048
2,099
2,002
2,064
474
483
514
521
508
516
1,180
1,182
1,188
1,189
1,187
1,188
1,119
1,122
1,129
1,131
1,128
1,130
3,070
3,300
4,011
4,173
3,868
4,062
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

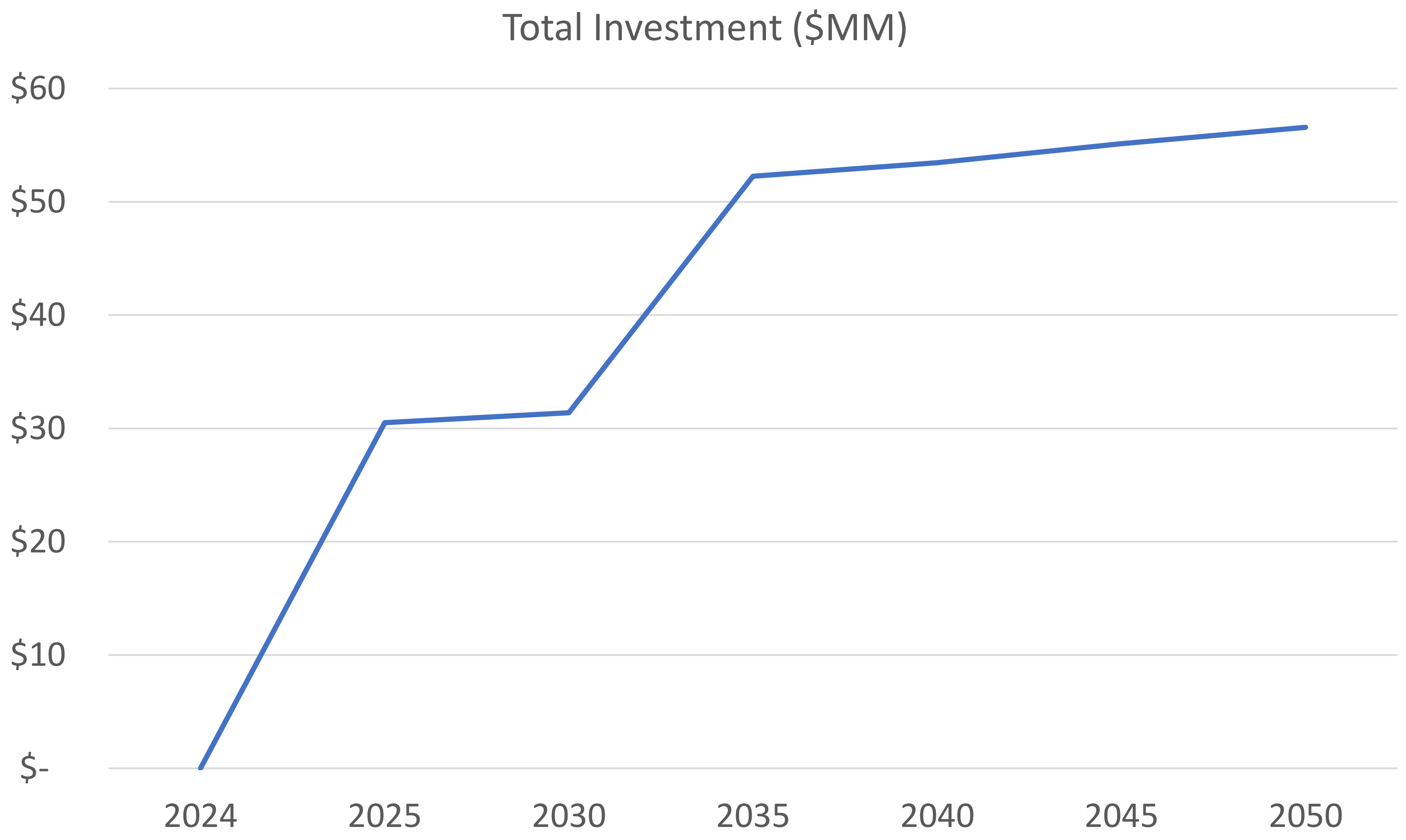
REFERENCE SCENARIO **INPUTS: RESIDENTIAL HVAC**, WEST OREGON



Investments in residential HVAC devices based on consumer adoption rates from EER modeling.

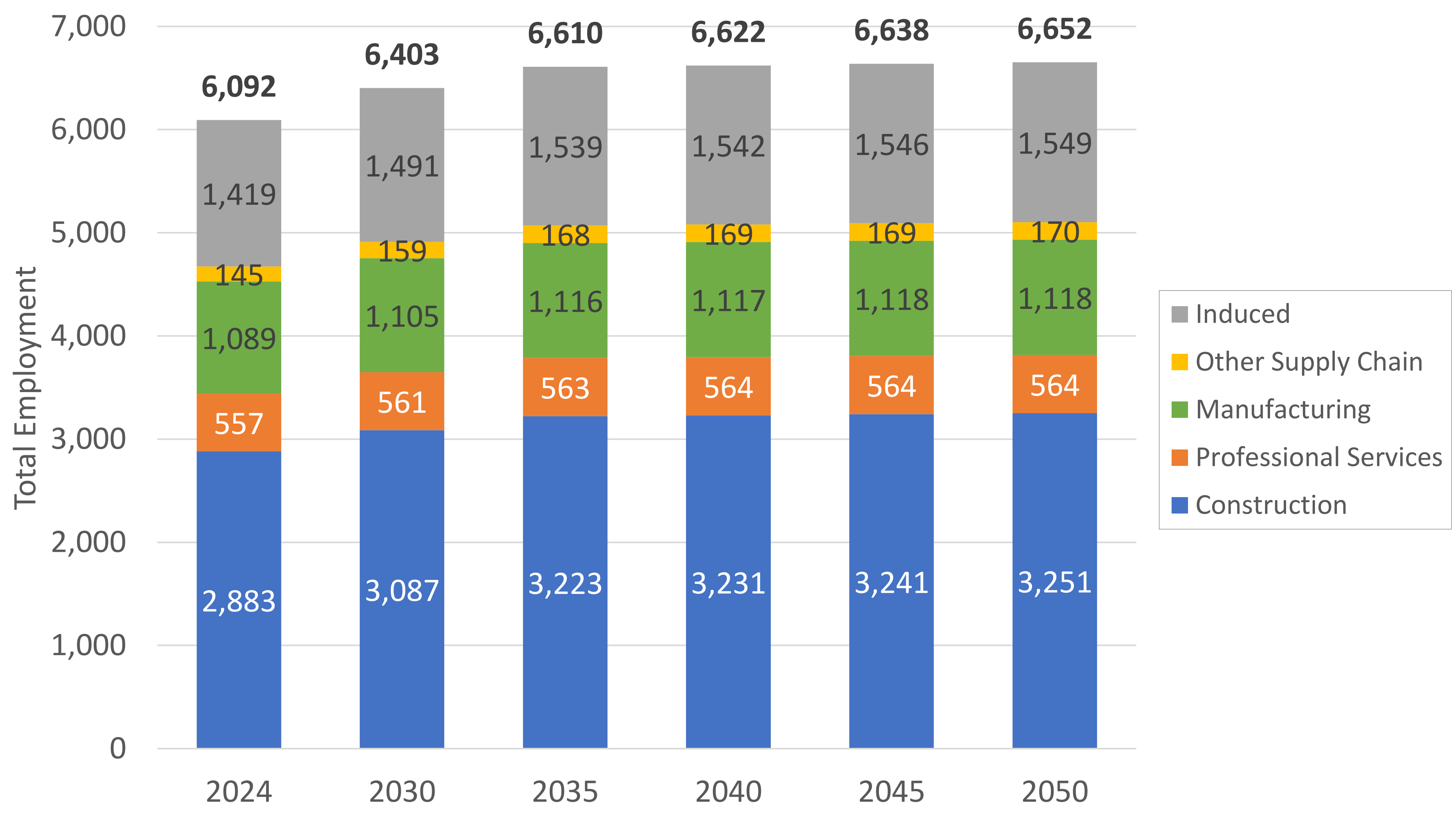

REFERENCE SCENARIO OUTPUTS: RESIDENTIAL HVAC, WEST OREGON
Total Employment
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2024
2030
2035
2040
2045
2050
14,392
14,377
14,823
15,002
15,295
15,467
3,319
3,316
3,419
3,460
3,527
3,567
744
743
758
764
774
780
1,329
1,329
1,335
1,337
1,340
1,343
1,818
1,818
1,822
1,824
1,826
1,828
7,182
7,171
7,489
7,617
7,828
7,949
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: RESIDENTIAL SHELL**, WEST OREGON



All investments are incremental, so starting investment in 2024 is $0. Tax credits for these retrofits roll off in 2032.

REFERENCE SCENARIO **OUTPUTS: RESIDENTIAL SHELL**, WEST OREGON



Oregon Energy Strategy

Part 3: Initial Employment Outputs

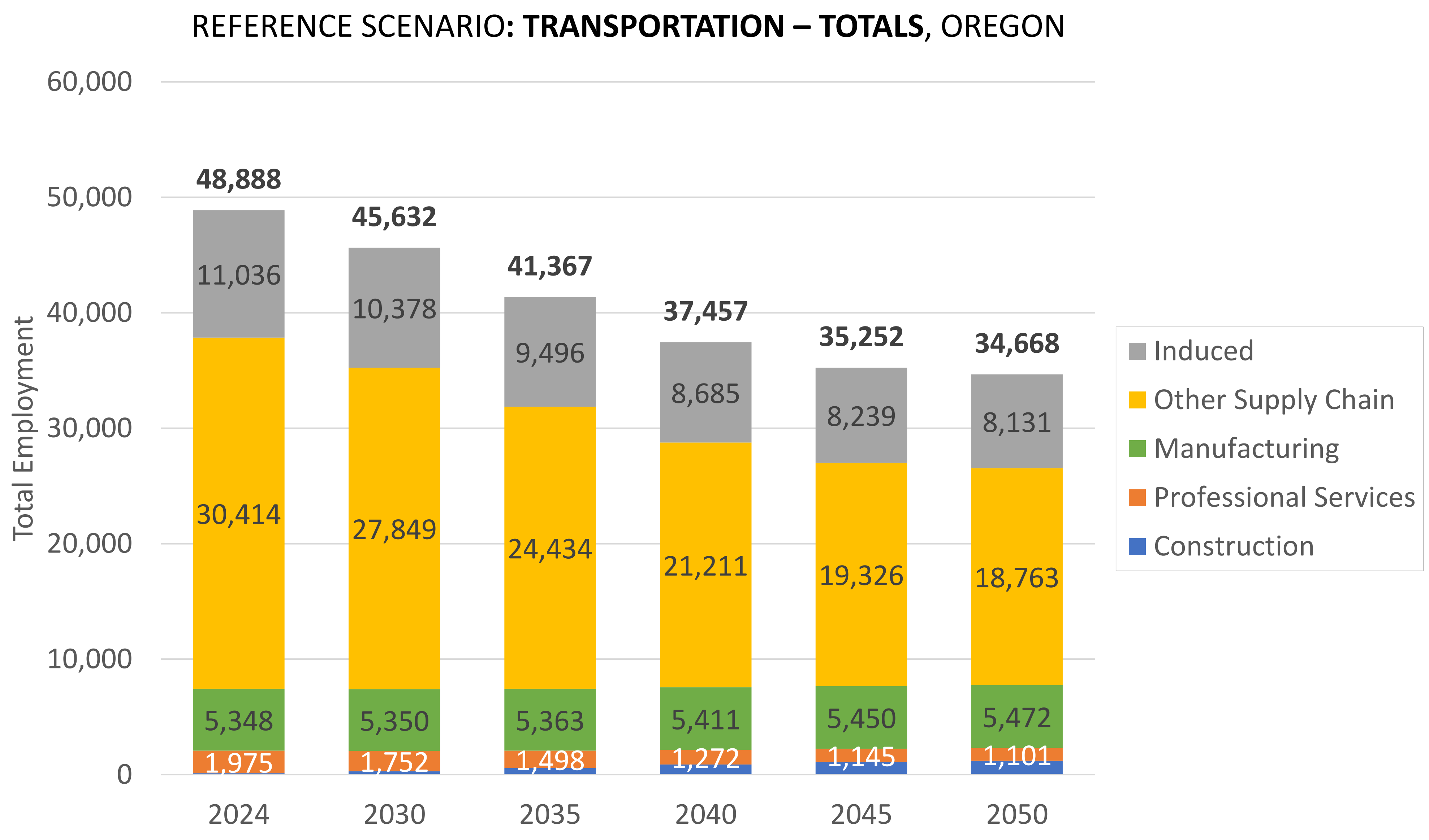
Transportation

III. Transportation

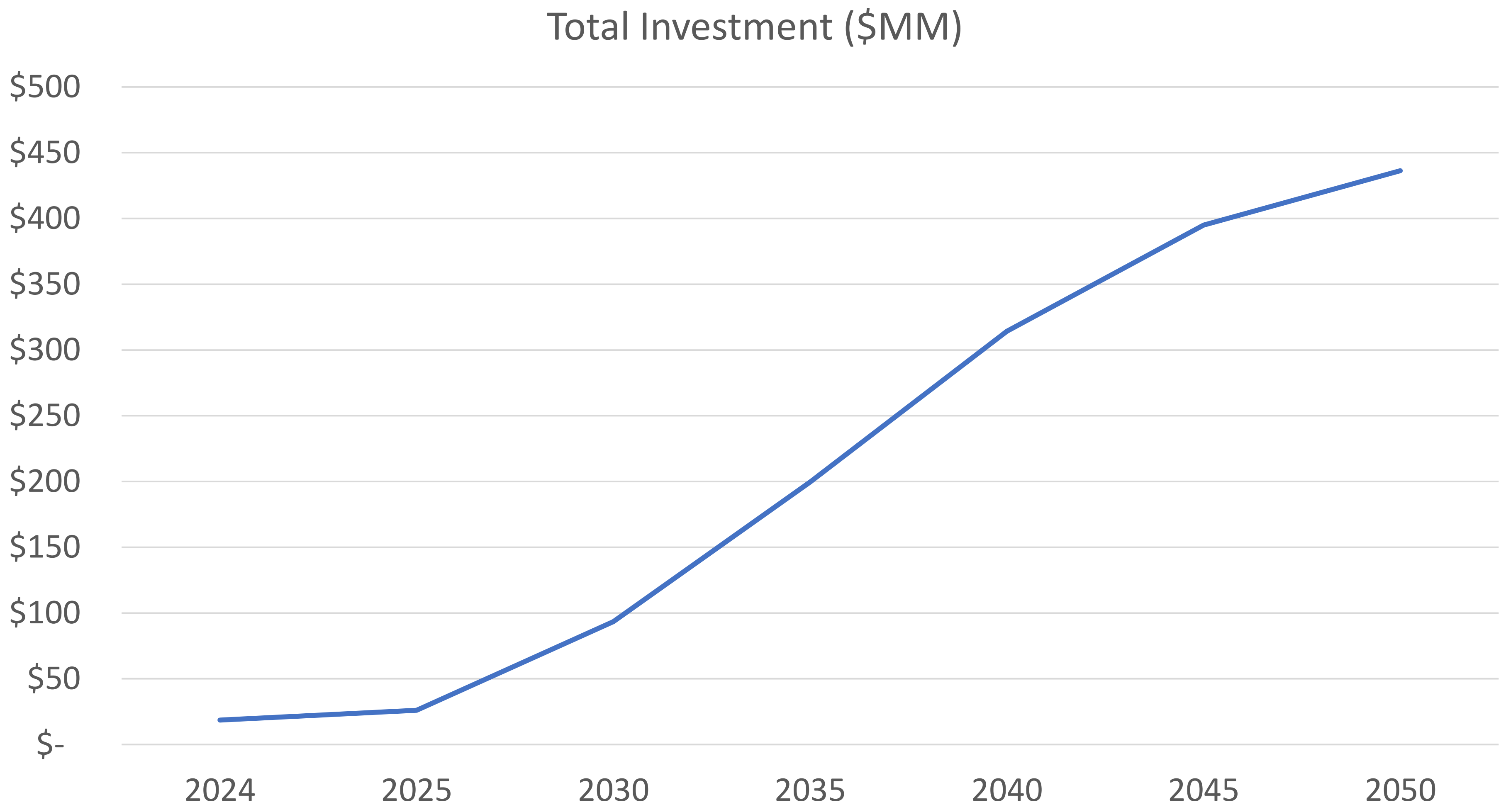
1. Charging Stations
2. Fueling Stations
3. Vehicle Maintenance
4. Vehicle Manufacturing
5. Wholesale Trade Parts

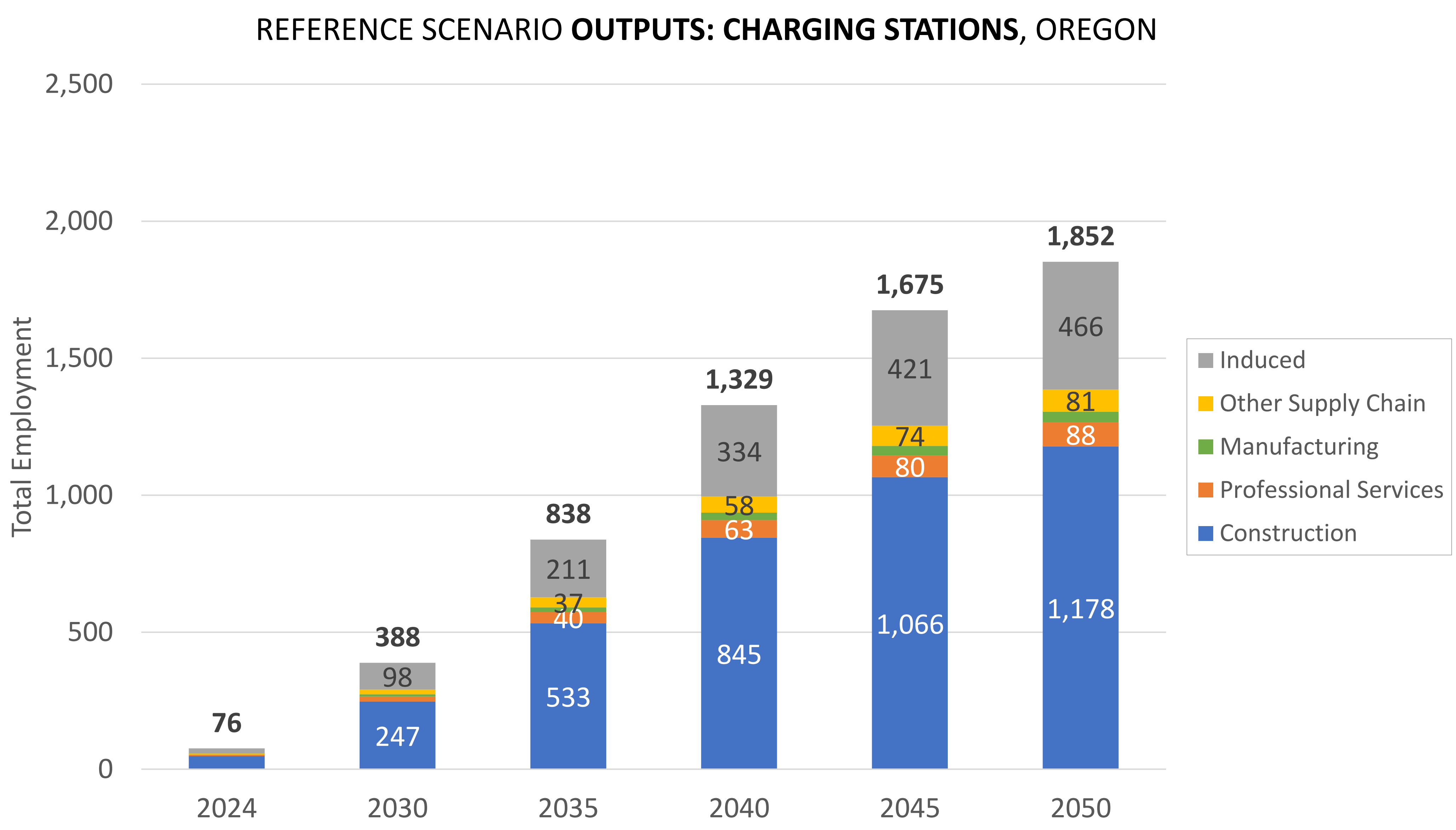
TRANSPORTATION: REFERENCE, OREGON

SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Charging Stations	76	388	838	1,329	1,675	1,852
Vehicle Manufacturing	7,300	7,300	7,311	7,364	7,417	7,443
Wholesale Trade Parts	7,429	7,770	7,969	8,196	8,475	8,762
Sub-total	**14,804**	**15,459**	**16,119**	**16,889**	**17,568**	**18,057**
Change		**654**	**1,315**	**2,085**	**2,763**	**3,252**
Displacement Sub-Sectors						
Fueling Stations	17,003	14,094	10,933	8,136	6,531	5,876
Vehicle Maintenance	17,080	16,080	14,316	12,432	11,154	10,736
Sub-total	**34,083**	**30,174**	**25,248**	**20,568**	**17,684**	**16,612**
Change		**-3,910**	**-8,835**	**-13,515**	**-16,399**	**-17,471**
Transportation OVERALL	48,888	45,632	41,367	37,457	35,252	34,668
Net Change from 2024		-3,256	-7,520	-11,430	-13,635	-14,219

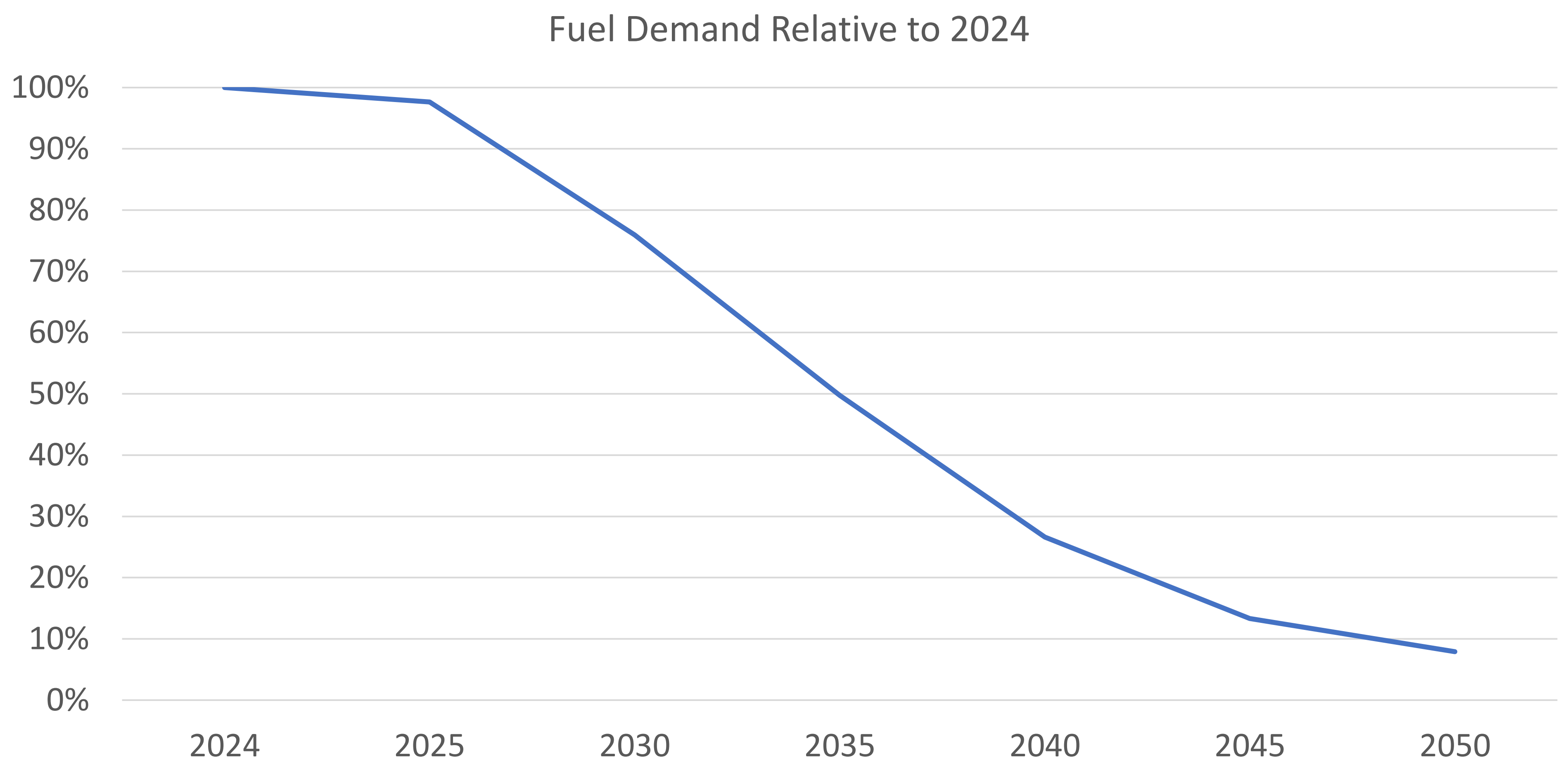

REFERENCE SCENARIO: TRANSPORTATION – TOTALS, OREGON
Total Employment
60,000
50,000
40,000
30,000
20,000
10,000
0
48,888
45,632
41,367
37,457
35,252
34,668
11,036
10,378
9,496
8,685
8,239
8,131
30,414
27,849
24,434
21,211
19,326
18,763
5,348
5,350
5,363
5,411
5,450
5,472
1,975
1,752
1,498
1,272
1,145
1,101
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: CHARGING STATIONS**, OREGON

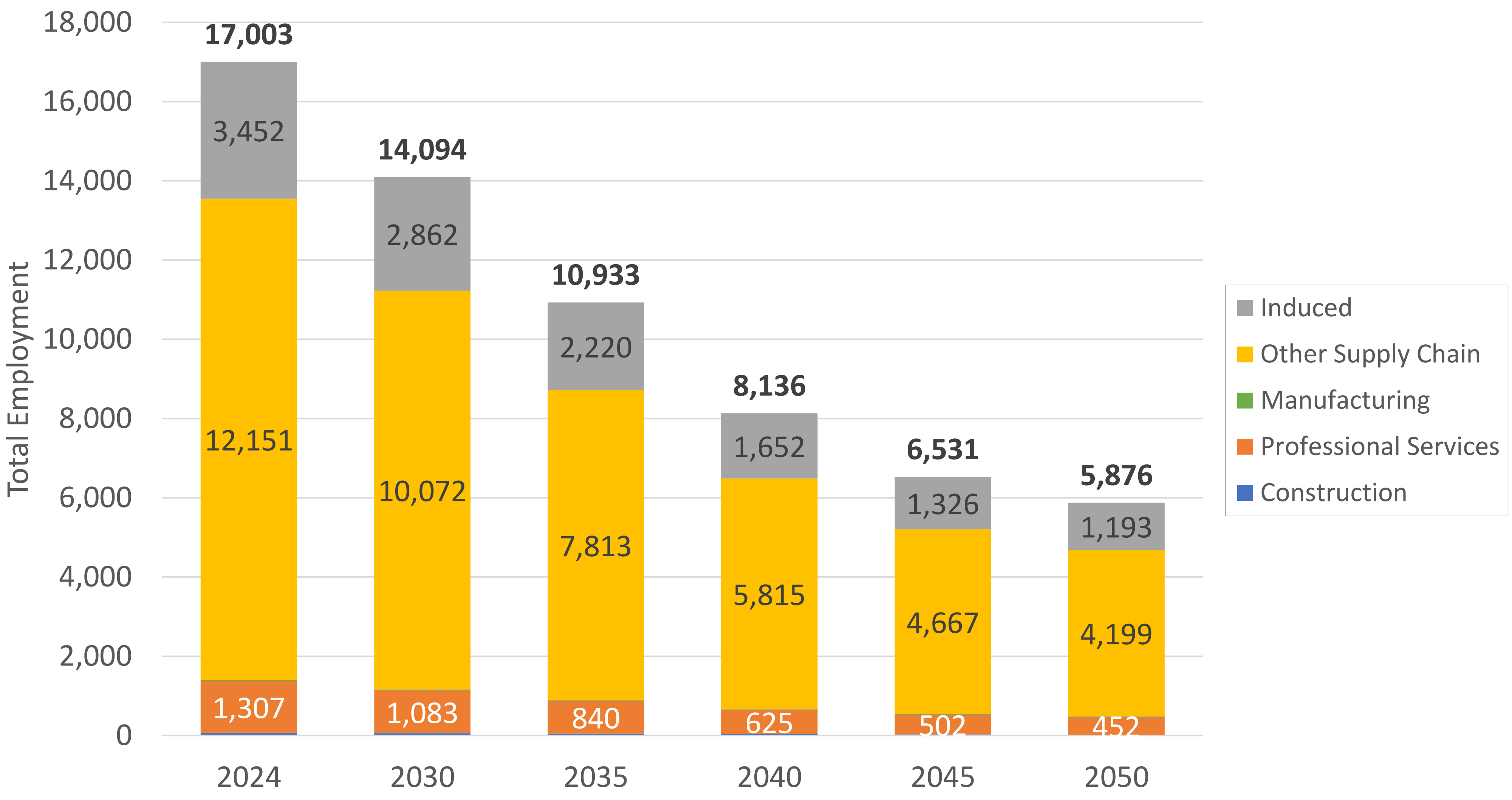



REFERENCE SCENARIO **OUTPUTS: CHARGING STATIONS**, OREGON
2,500
2,000
1,500
1,000
500
0
Total Employment
76
388
98
247
838
211
37
40
533
1,329
334
58
63
845
1,675
421
74
80
1,066
1,852
466
81
88
1,178
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

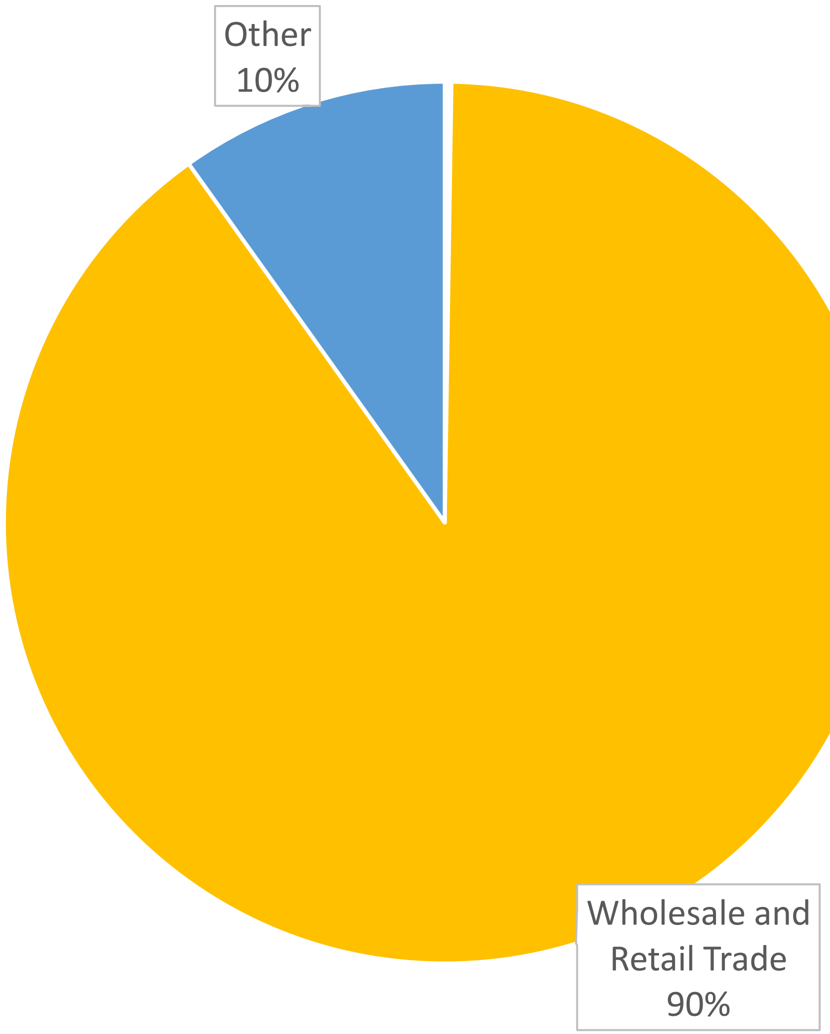
REFERENCE SCENARIO **INPUTS: FUELING STATIONS**, OREGON



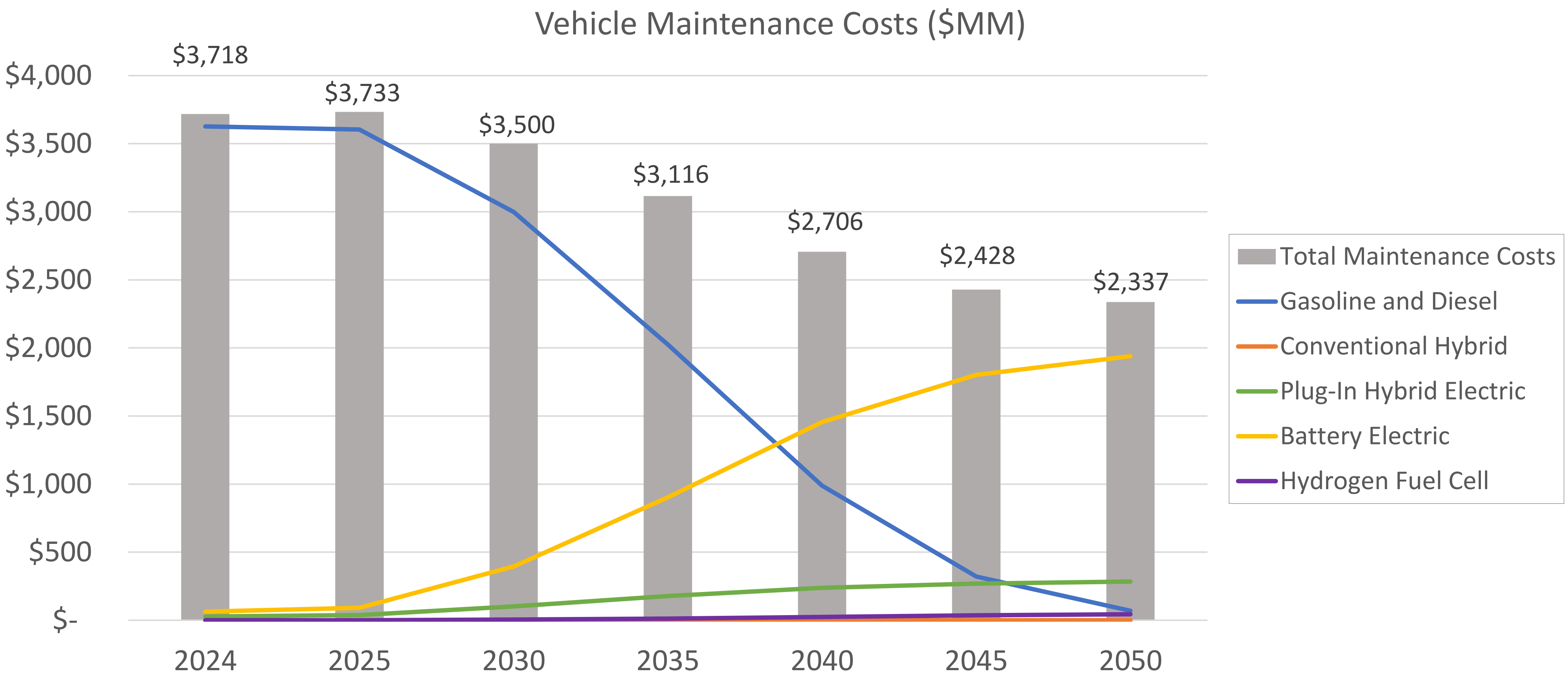
REFERENCE SCENARIO **OUTPUTS: FUELING STATIONS**, OREGON

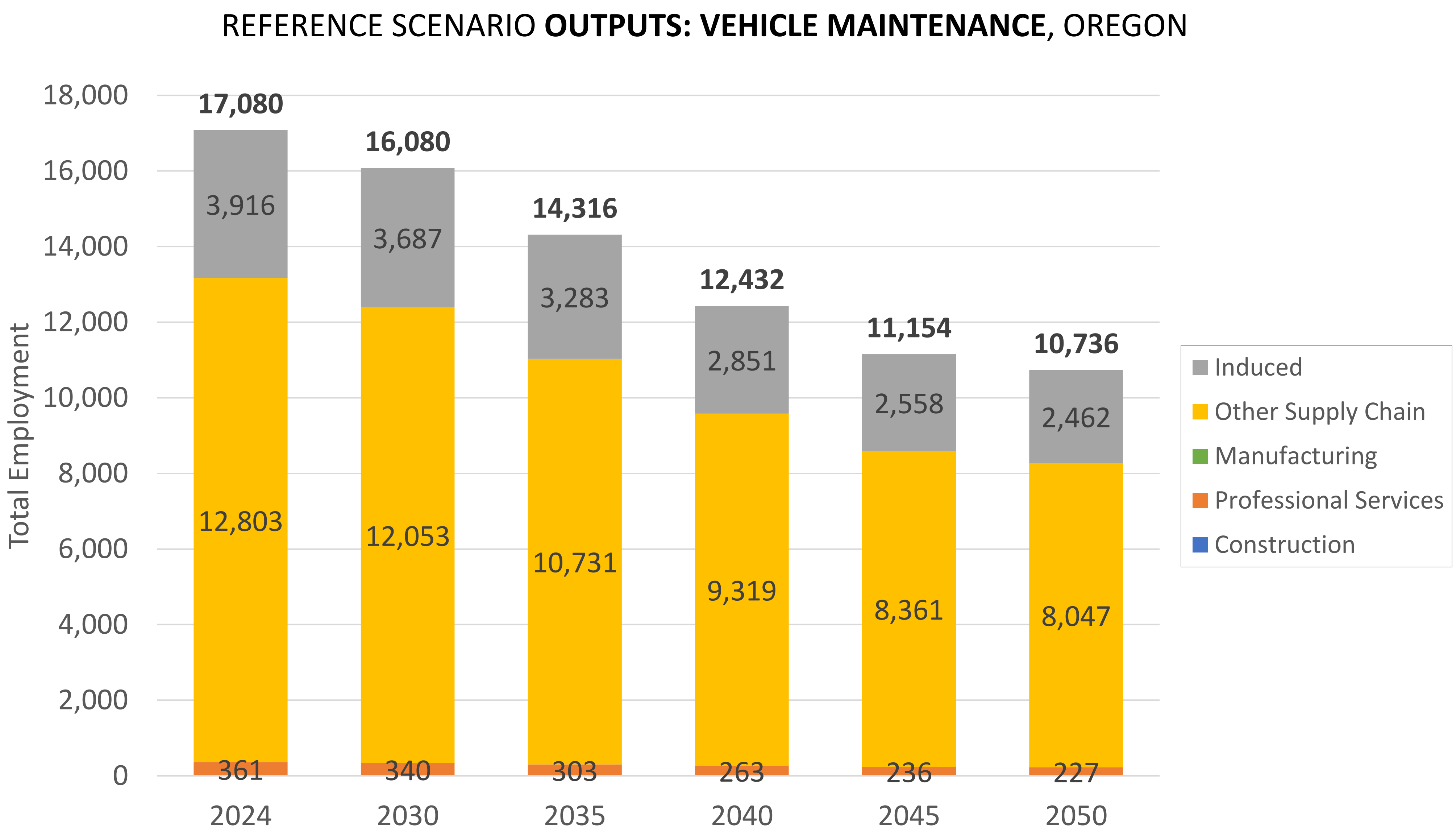


OTHER SUPPLY CHAIN BREAKOUT: **FUELING STATIONS**, OREGON



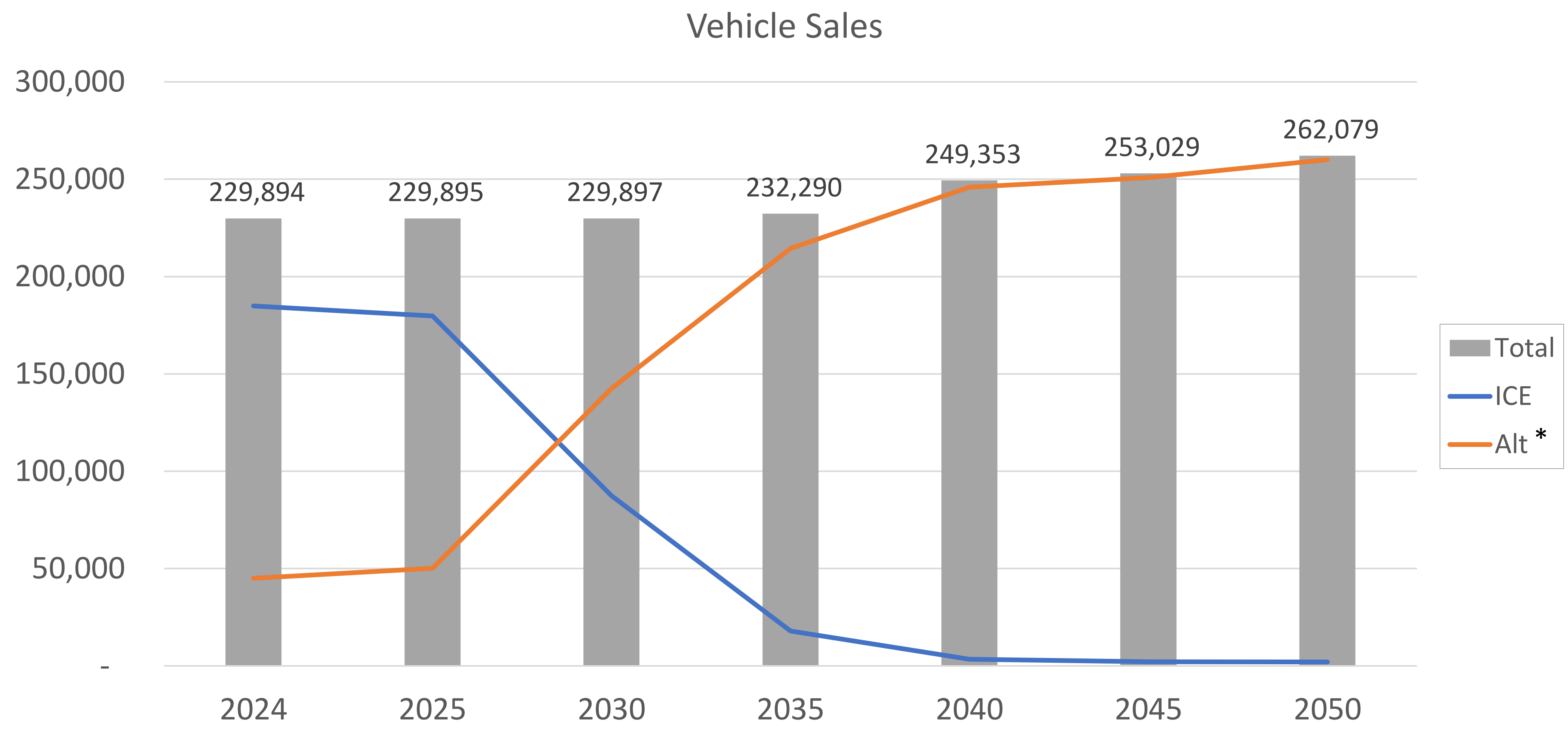
REFERENCE SCENARIO **INPUTS: VEHICLE MAINTENANCE**, OREGON



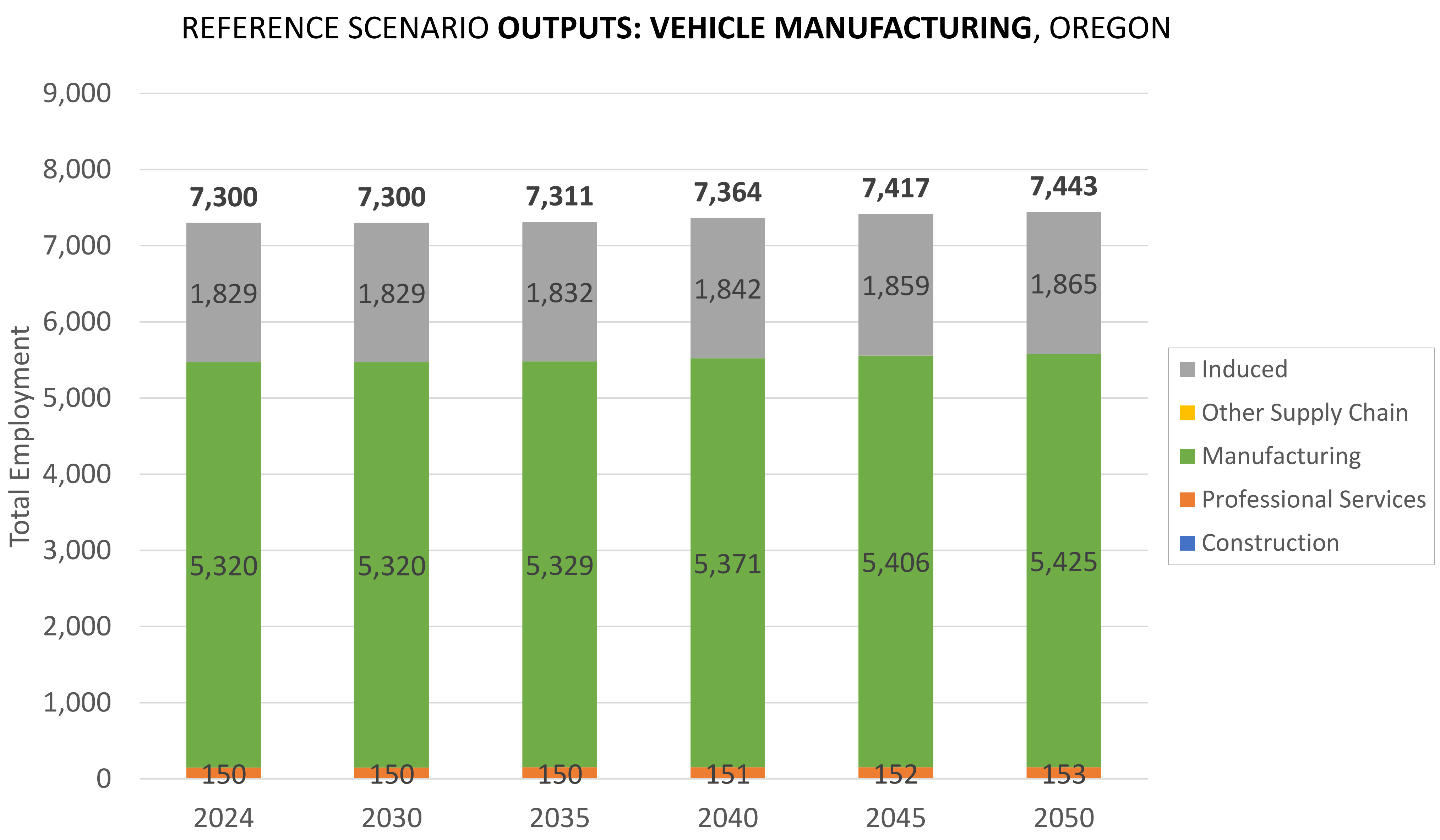


Note: Other Supply Chain employment is composed entirely of employment in the Automotive Repair and Maintenance industry

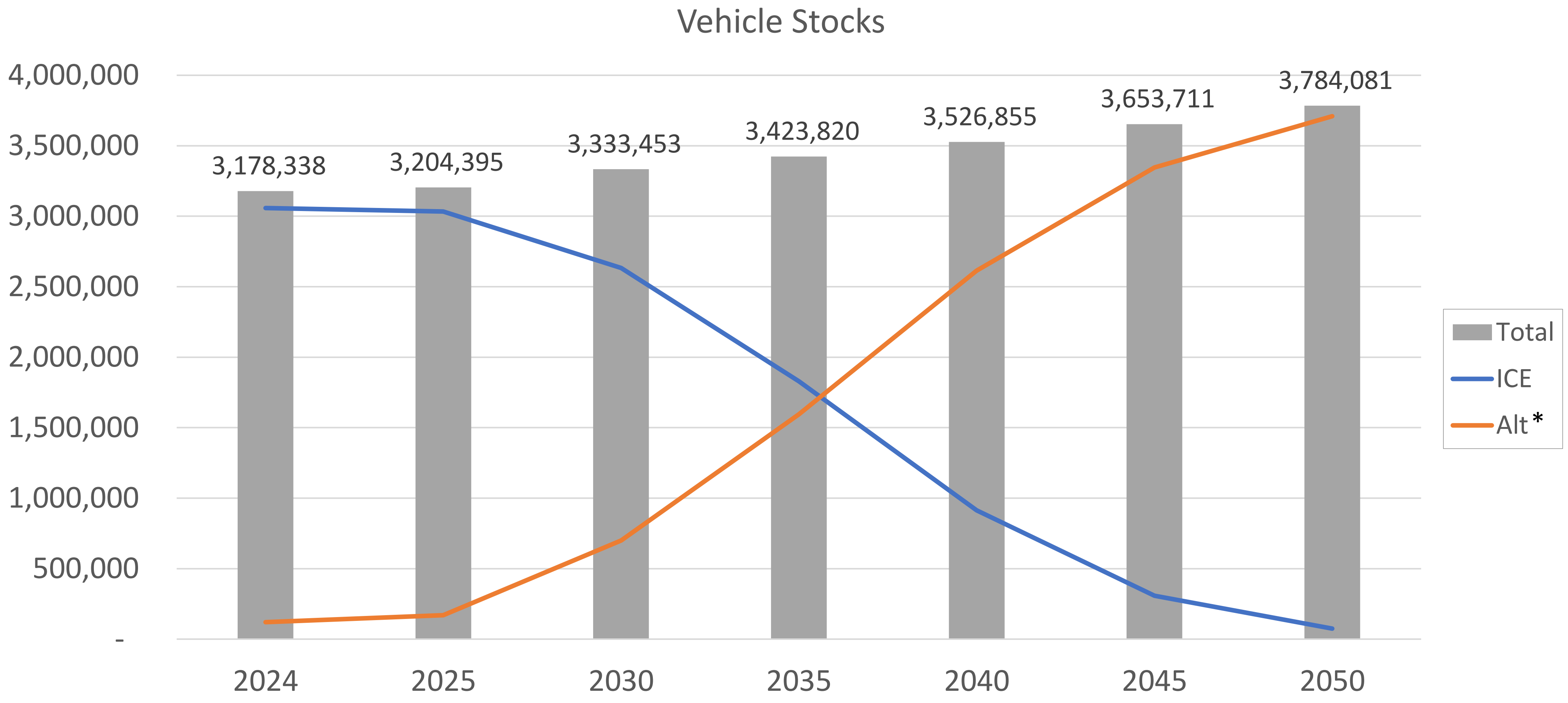
REFERENCE SCENARIO **INPUTS: VEHICLE MANUFACTURING**, OREGON



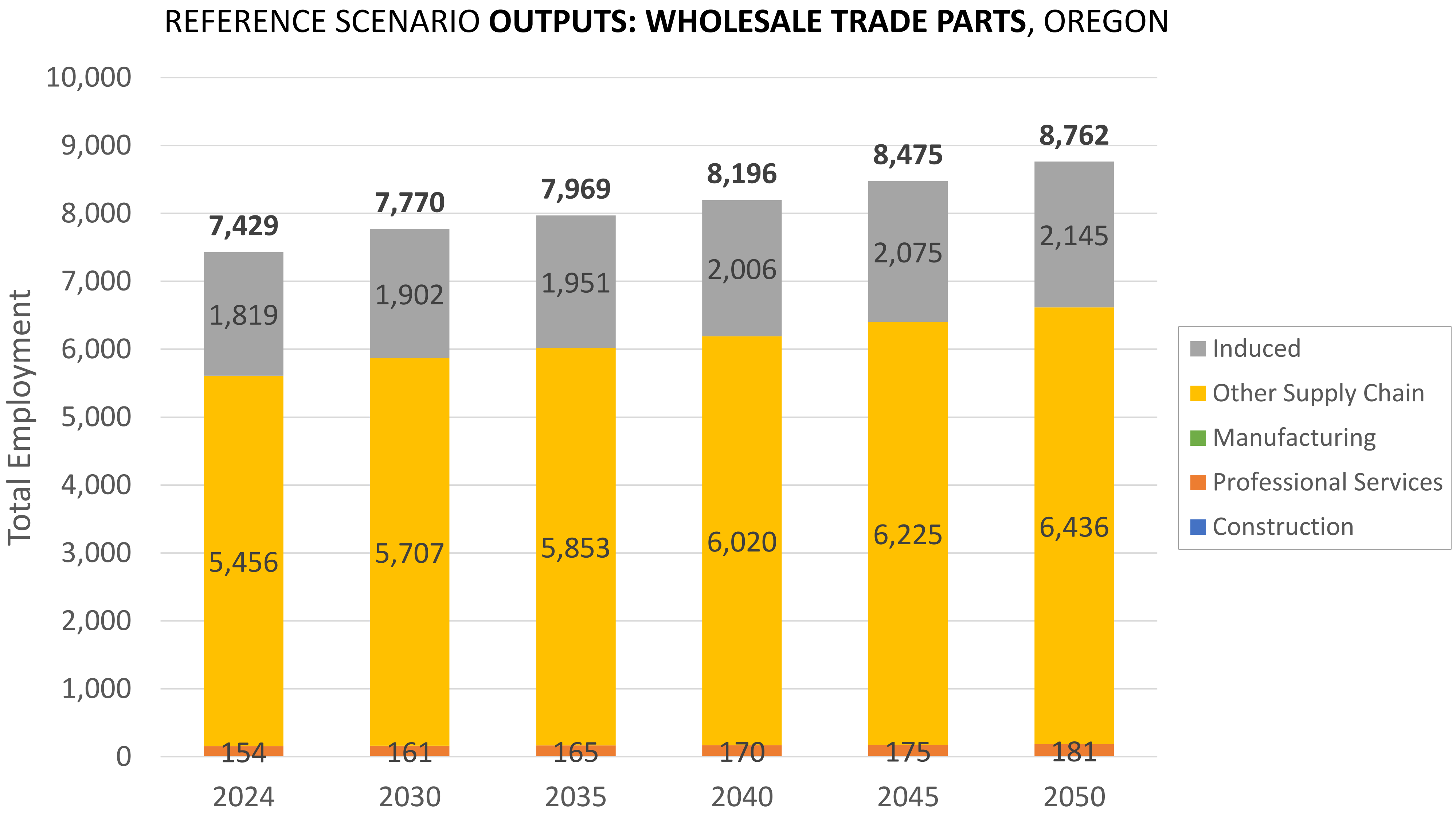
* Alt vehicle technologies include battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles.


REFERENCE SCENARIO OUTPUTS: VEHICLE MANUFACTURING, OREGON
Total Employment
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
7,300
7,300
7,311
7,364
7,417
7,443
1,829
1,829
1,832
1,842
1,859
1,865
5,320
5,320
5,329
5,371
5,406
5,425
150
150
150
151
152
153
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: WHOLESALE TRADE PARTS**, OREGON



* Alt vehicle technologies include battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles.



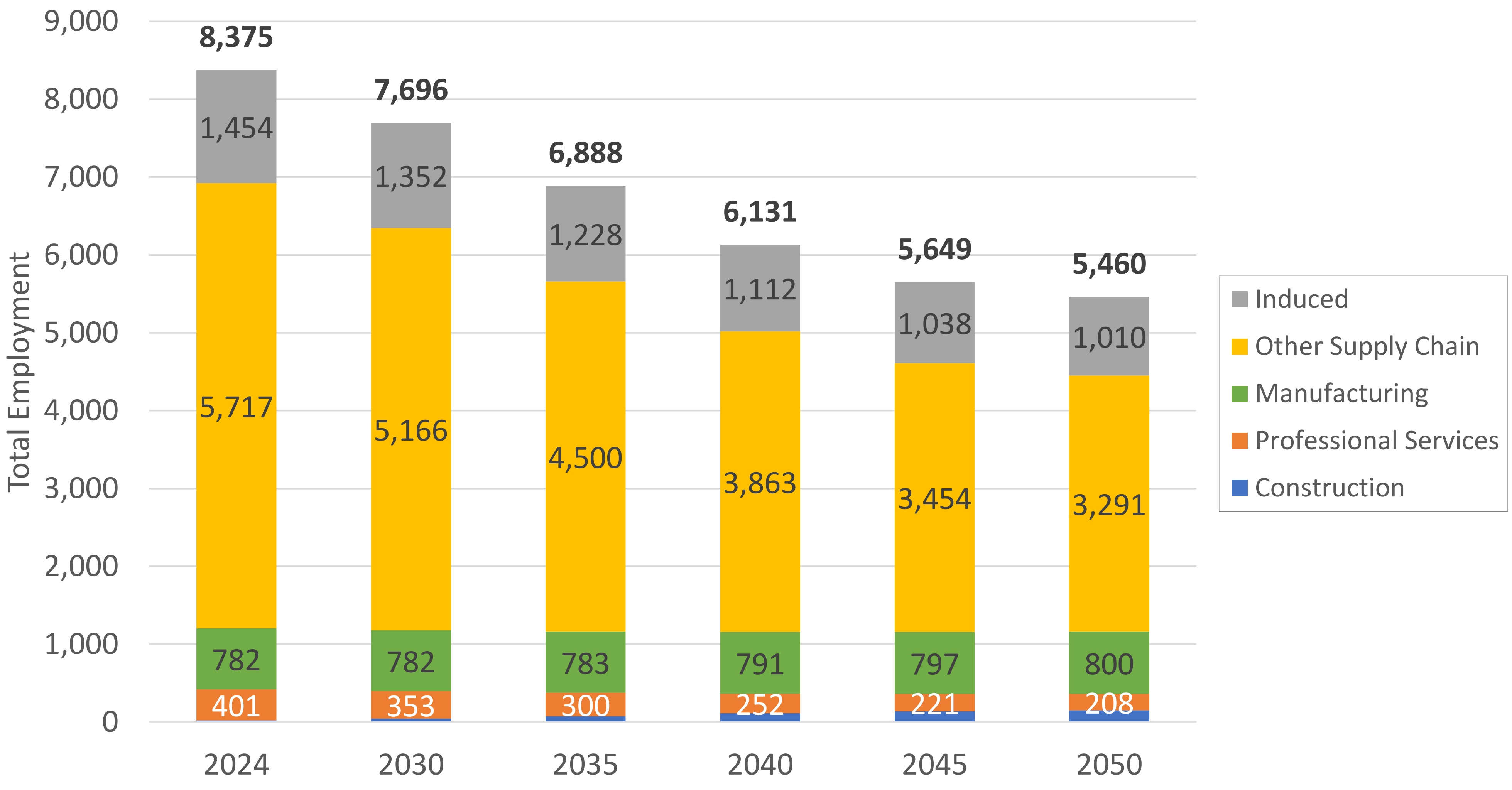
Note: Other Supply Chain employment is composed entirely of employment in the Wholesale Trade industry

REFERENCE SCENARIO: **TRANSPORTATION**, EAST OREGON*

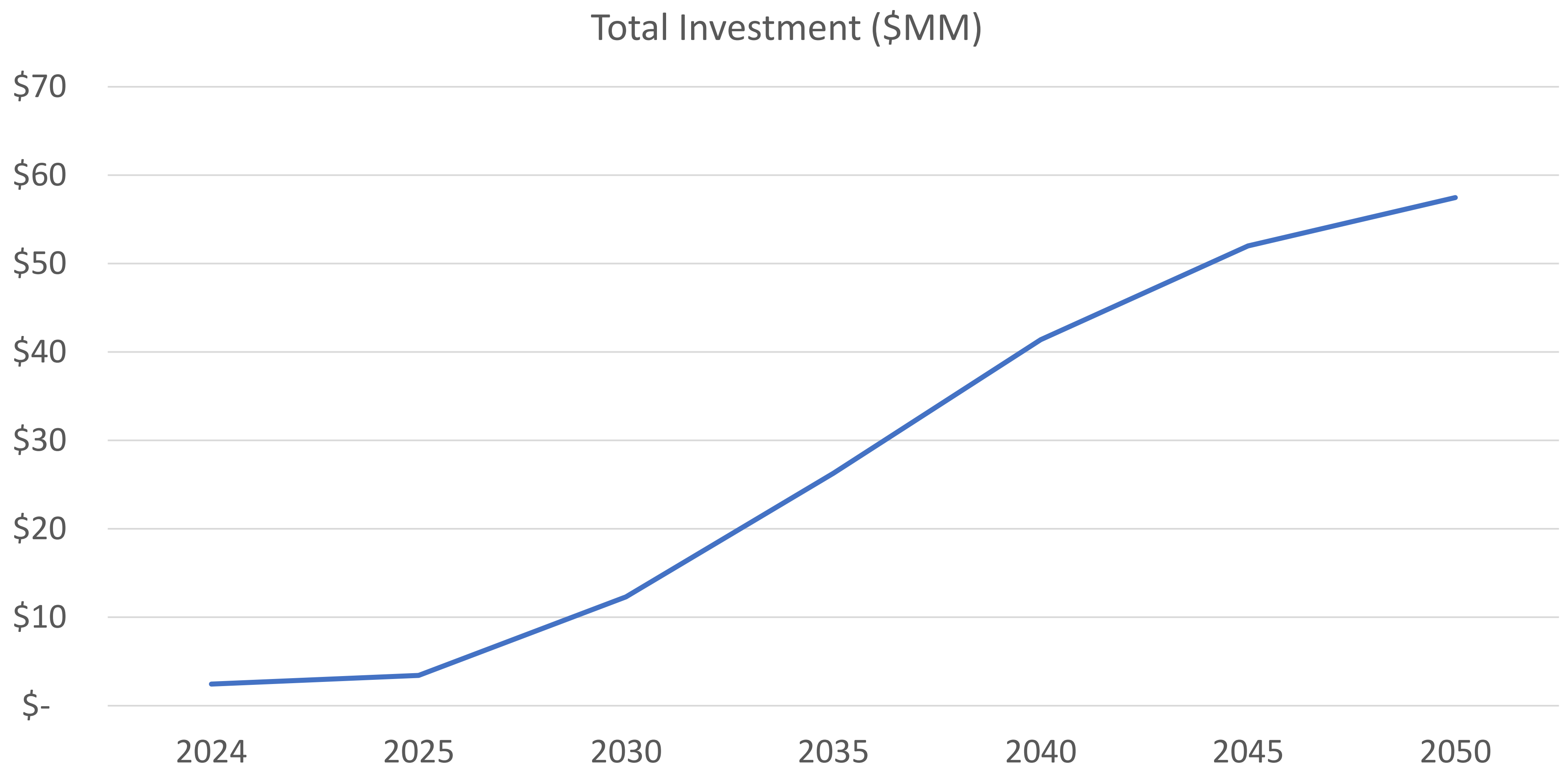
SUB-SECTOR	YEAR					
	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Charging Stations	9	46	99	156	197	218
Vehicle Manufacturing	1,011	1,011	1,012	1,023	1,030	1,034
Wholesale Trade Parts	1,020	1,056	1,078	1,102	1,132	1,163
Sub-total	**2,039**	**2,112**	**2,189**	**2,281**	**2,359**	**2,415**
Change		**73**	**150**	**242**	**320**	**376**
Displacement Sub-Sectors						
Fueling Stations	3,972	3,349	2,695	2,099	1,722	1,548
Vehicle Maintenance	2,364	2,234	2,005	1,750	1,568	1,498
Sub-total	**6,336**	**5,583**	**4,699**	**3,850**	**3,290**	**3,046**
Change		**-753**	**-1,637**	**-2,486**	**-3,046**	**-3,290**
Transportation OVERALL	8,375	7,696	6,888	6,131	5,649	5,460
Net Change from 2024		-679	-1,487	-2,244	-2,726	-2,915

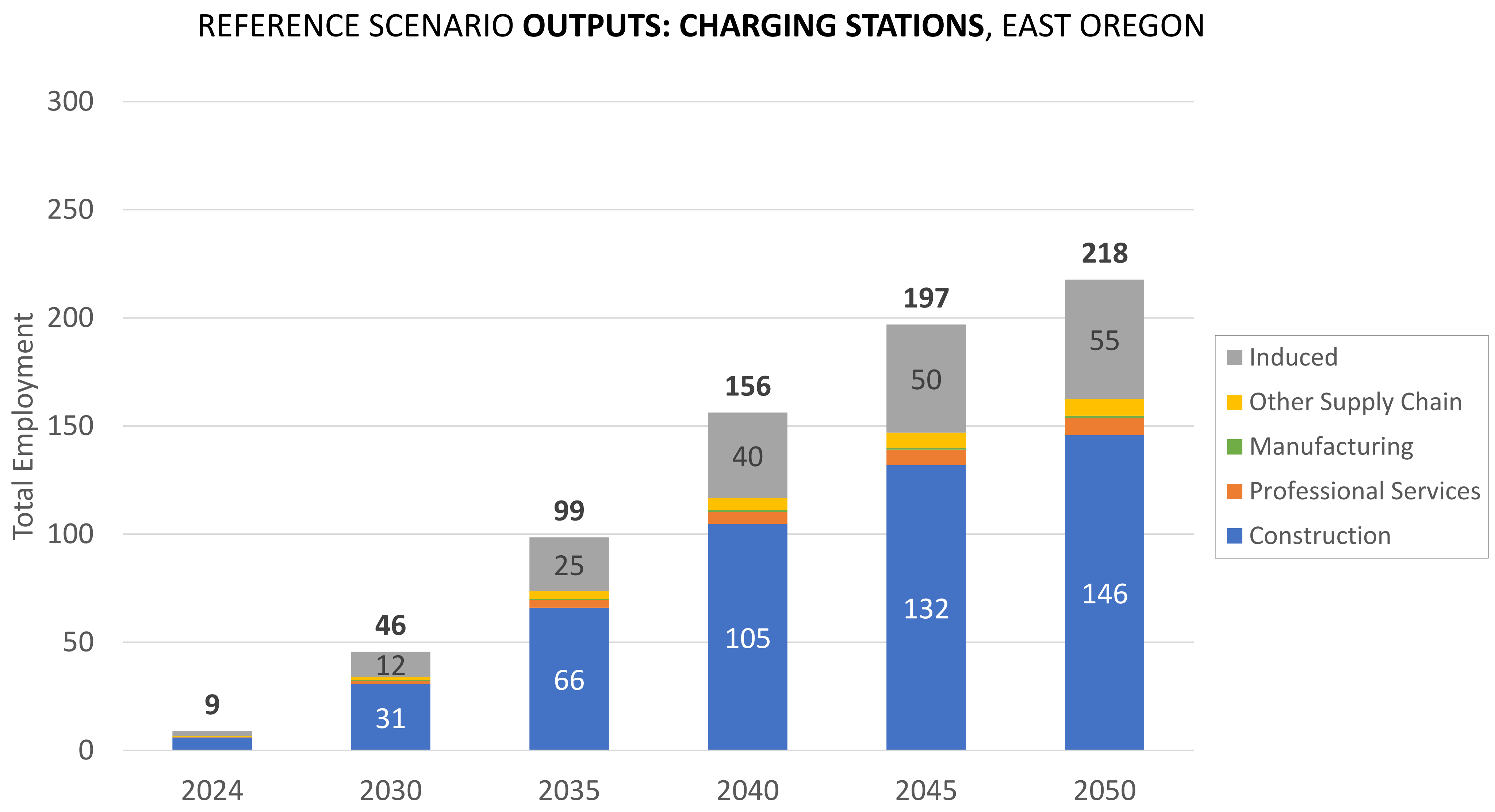
**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

REFERENCE SCENARIO: **TRANSPORTATION – TOTALS**, EAST OREGON

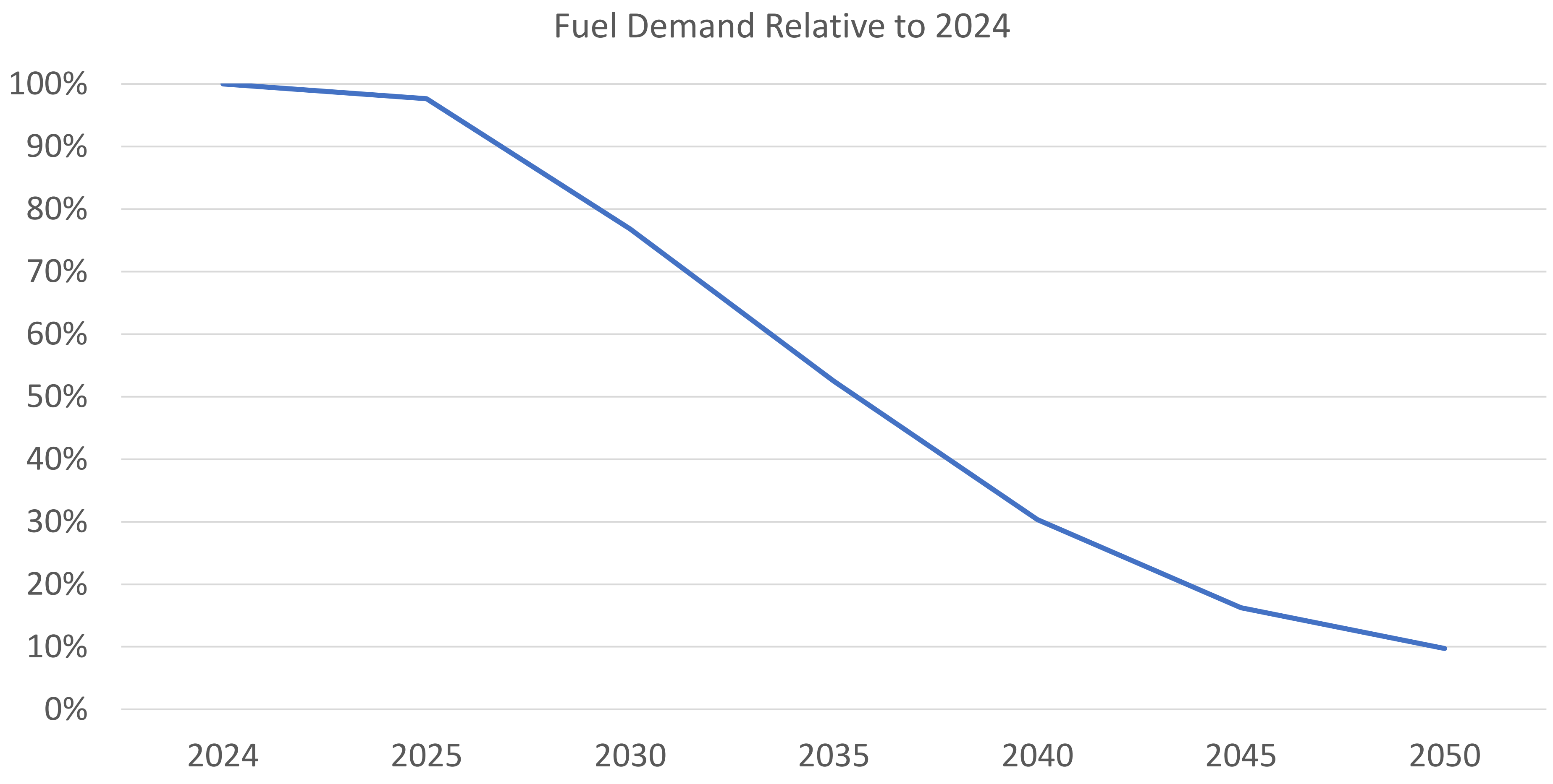


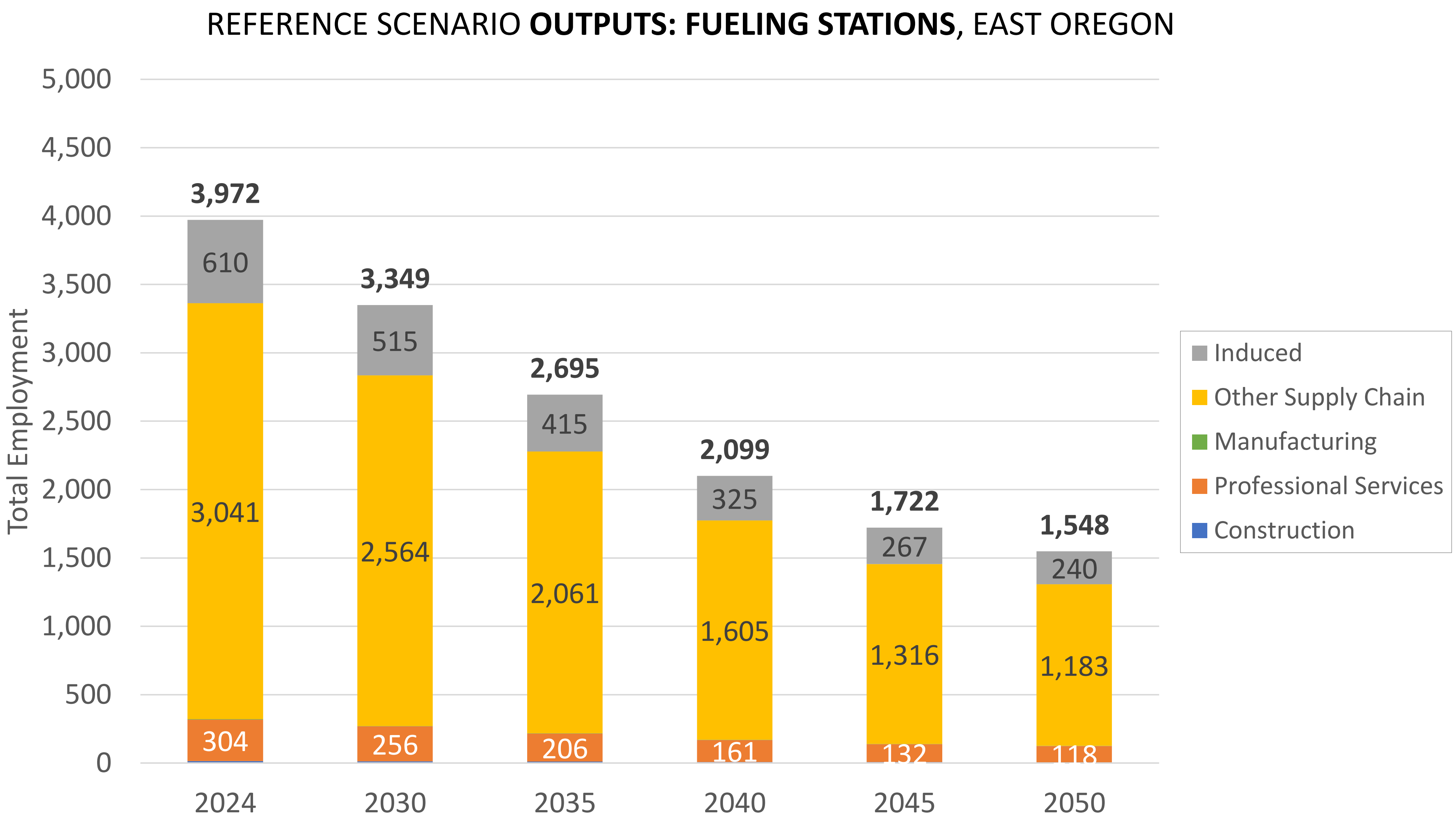
REFERENCE SCENARIO **INPUTS: CHARGING STATIONS**, EAST OREGON



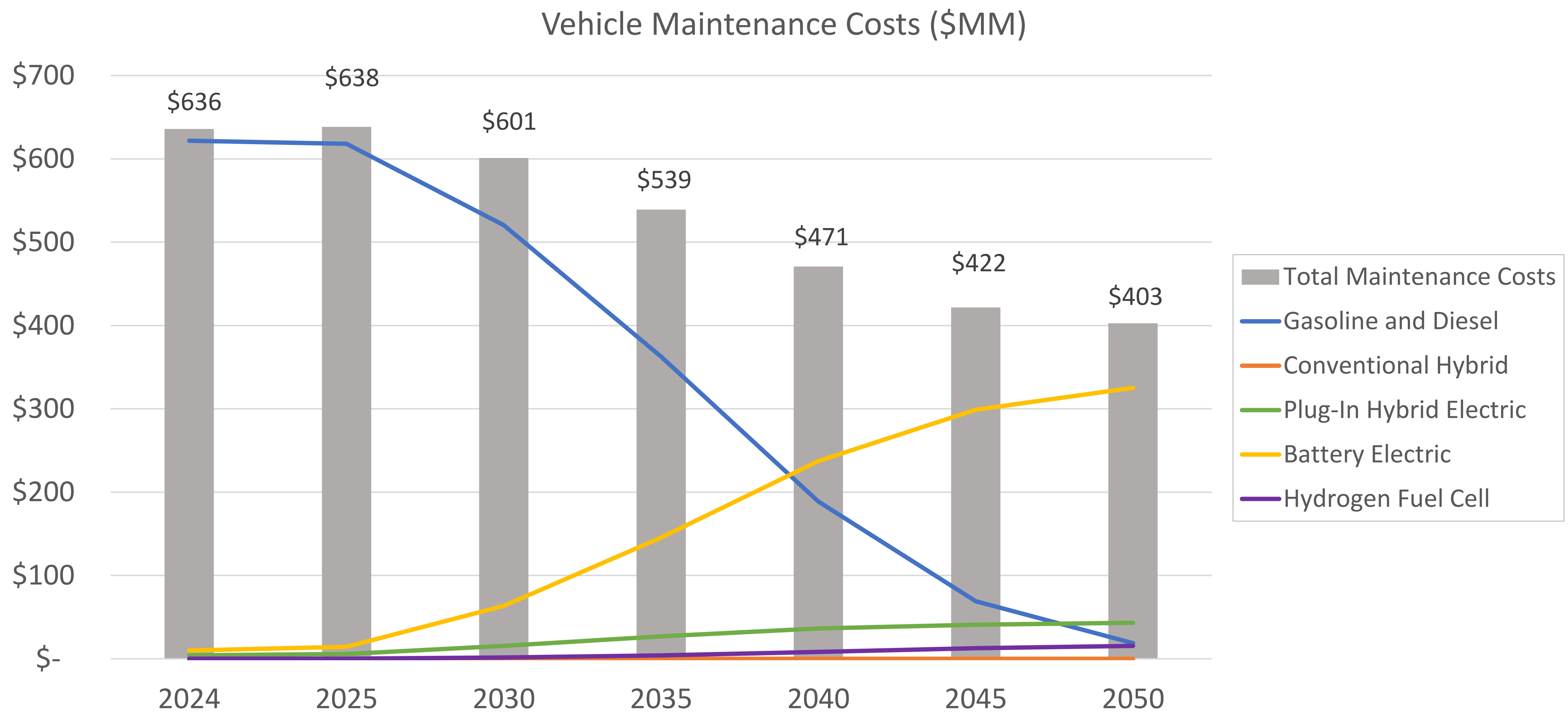

REFERENCE SCENARIO **OUTPUTS: CHARGING STATIONS**, EAST OREGON
Total Employment
300
250
200
150
100
50
0
2024
2030
2035
2040
2045
2050
9
46
12
31
99
25
66
156
40
105
197
50
132
218
55
146
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

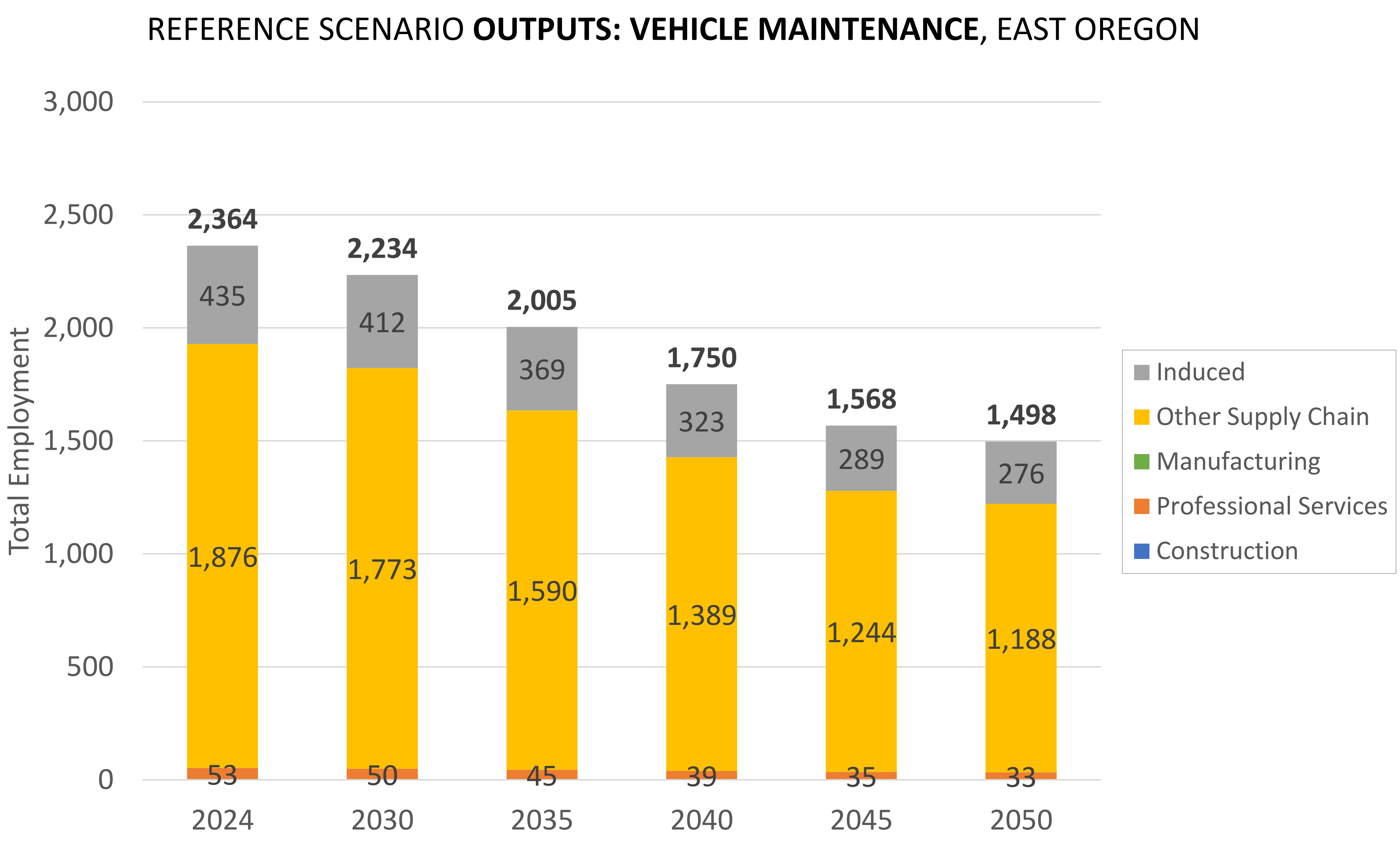
REFERENCE SCENARIO **INPUTS: FUELING STATIONS**, EAST OREGON



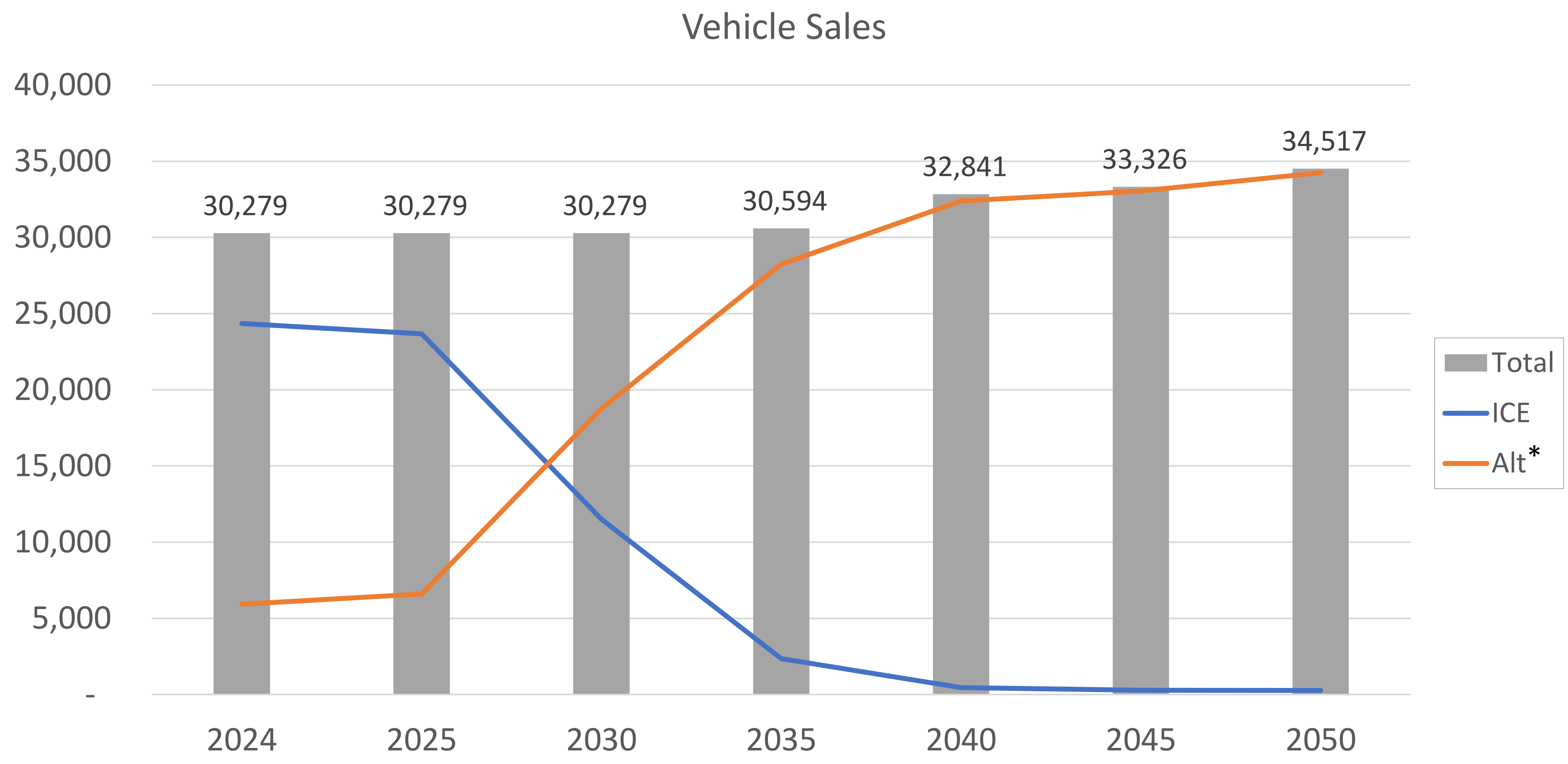

REFERENCE SCENARIO **OUTPUTS: FUELING STATIONS**, EAST OREGON
Total Employment
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2024
2030
2035
2040
2045
2050
3,972
610
3,041
304
3,349
515
2,564
256
2,695
415
2,061
206
2,099
325
1,605
161
1,722
267
1,316
132
1,548
240
1,183
118
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: VEHICLE MAINTENANCE**, EAST OREGON



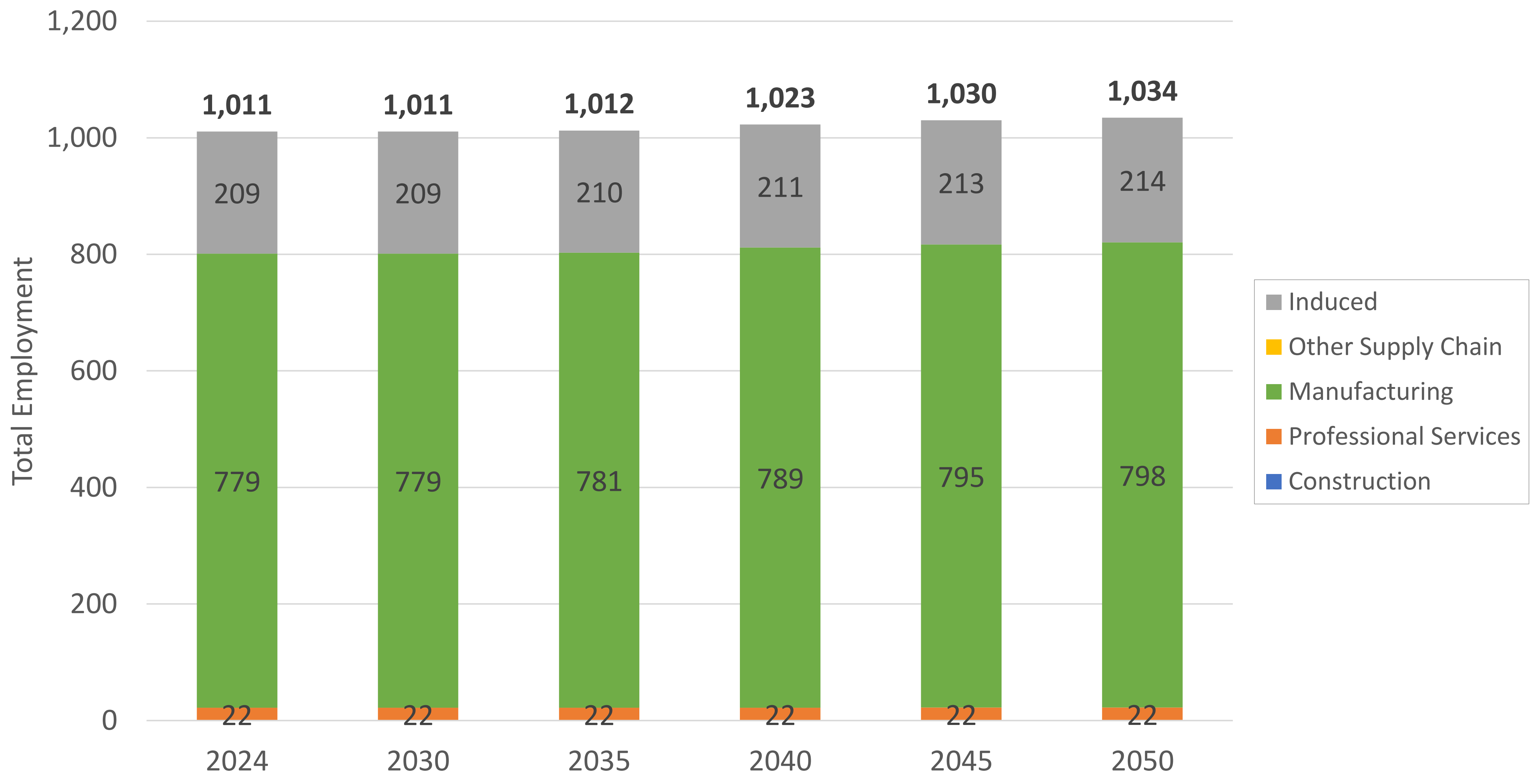

REFERENCE SCENARIO OUTPUTS: VEHICLE MAINTENANCE, EAST OREGON
Total Employment
3,000
2,500
2,000
1,500
1,000
500
0
2,364
435
1,876
53
2024
2,234
412
1,773
50
2030
2,005
369
1,590
45
2035
1,750
323
1,389
39
2040
1,568
289
1,244
35
2045
1,498
276
1,188
33
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: VEHICLE MANUFACTURING**, EAST OREGON

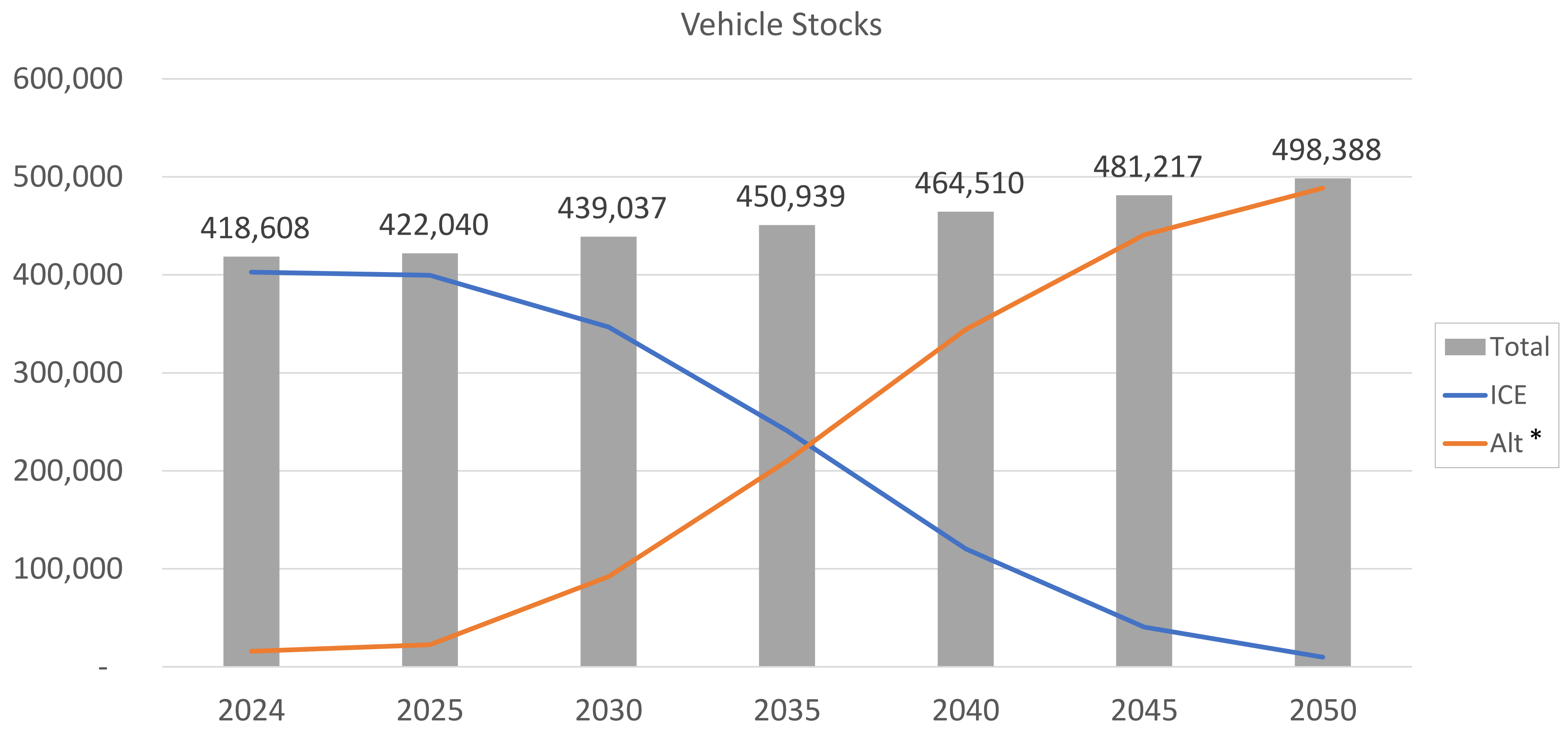


* Alt vehicle technologies include battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles.

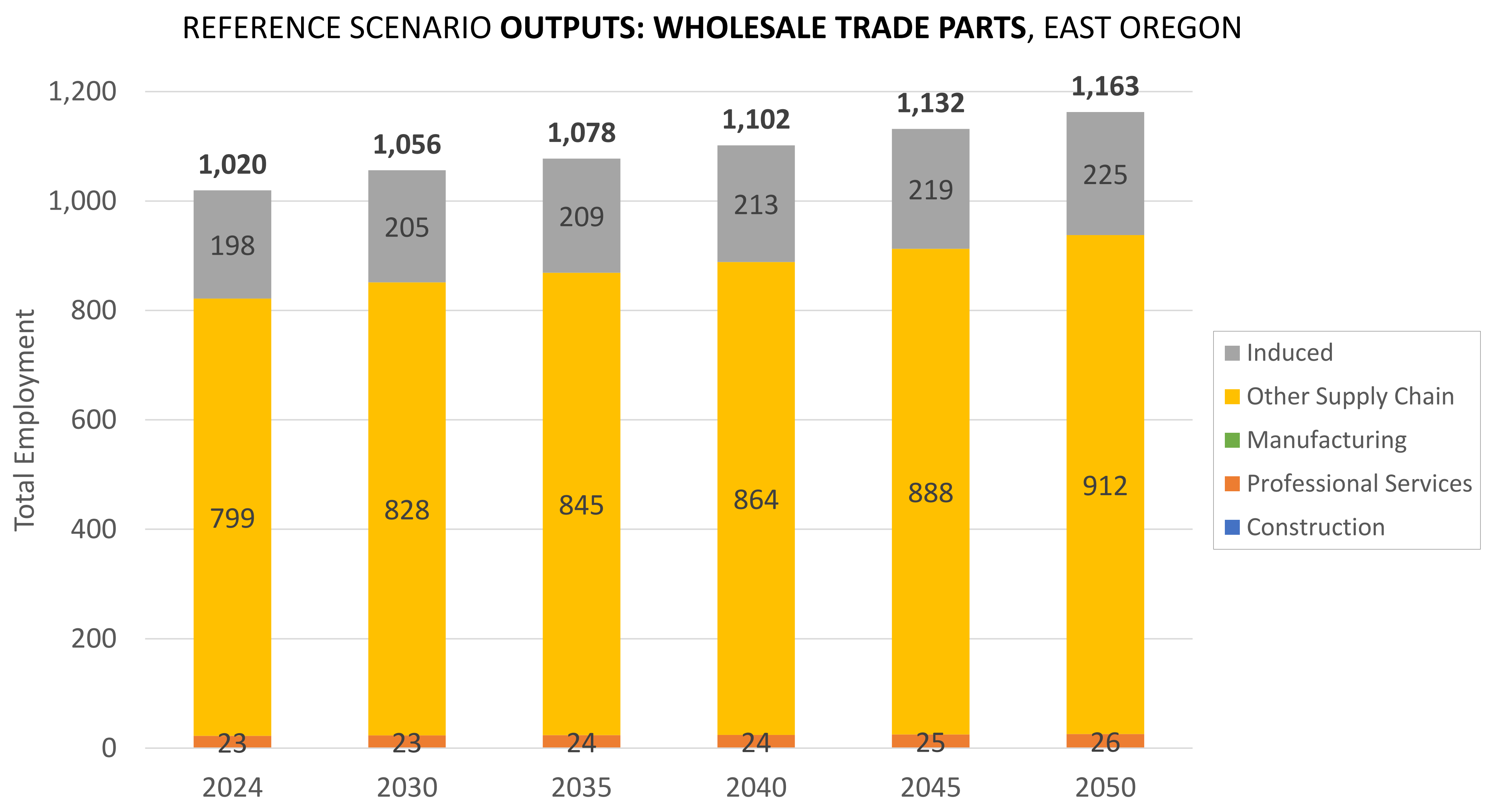
REFERENCE SCENARIO **OUTPUTS: VEHICLE MANUFACTURING**, EAST OREGON



REFERENCE SCENARIO **INPUTS: WHOLESALE TRADE PARTS**, EAST OREGON



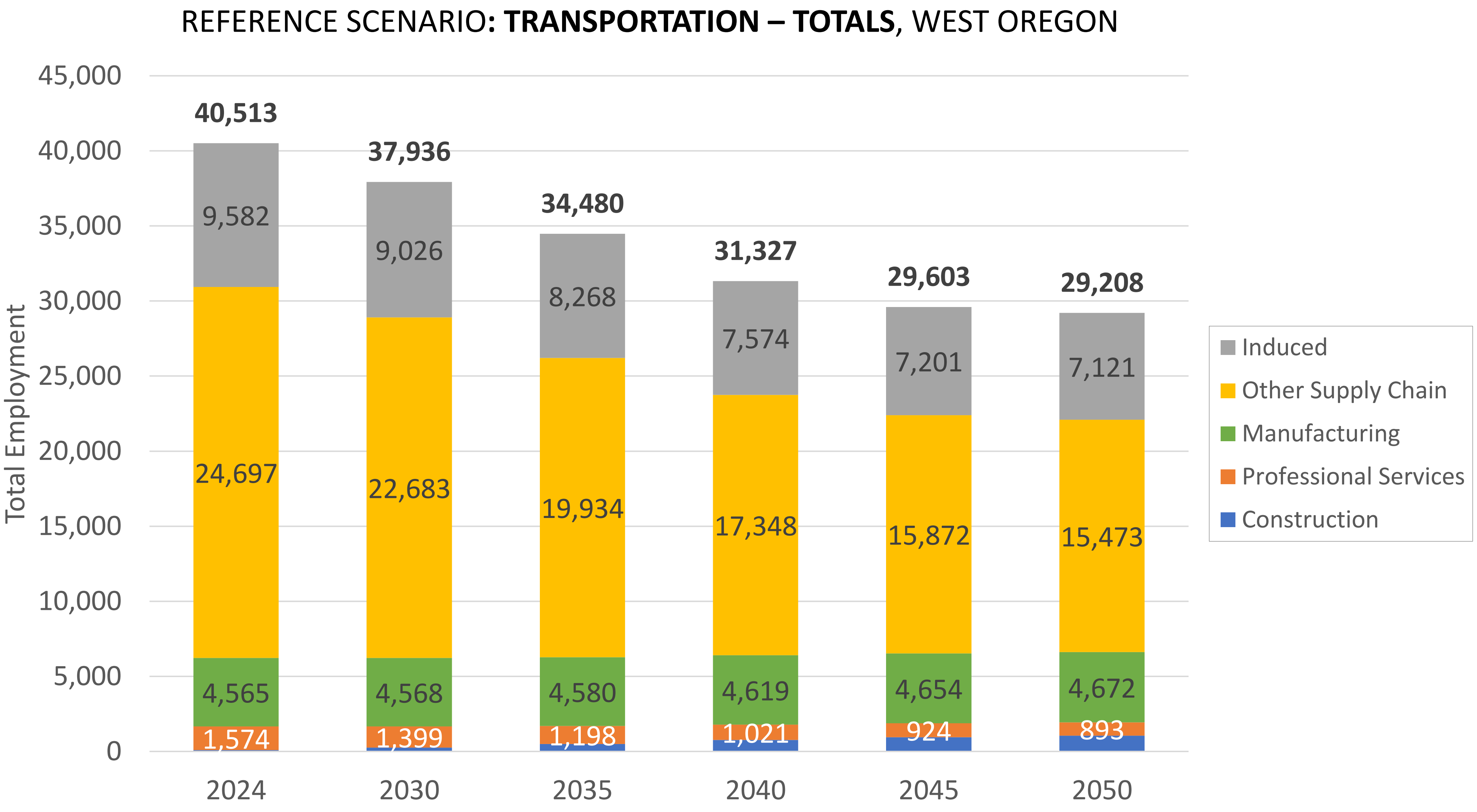
* Alt vehicle technologies include battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles.


REFERENCE SCENARIO **OUTPUTS: WHOLESALE TRADE PARTS**, EAST OREGON
Total Employment
1,200
1,000
800
600
400
200
0
1,020
1,056
1,078
1,102
1,132
1,163
198
205
209
213
219
225
799
828
845
864
888
912
23
23
24
24
25
26
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

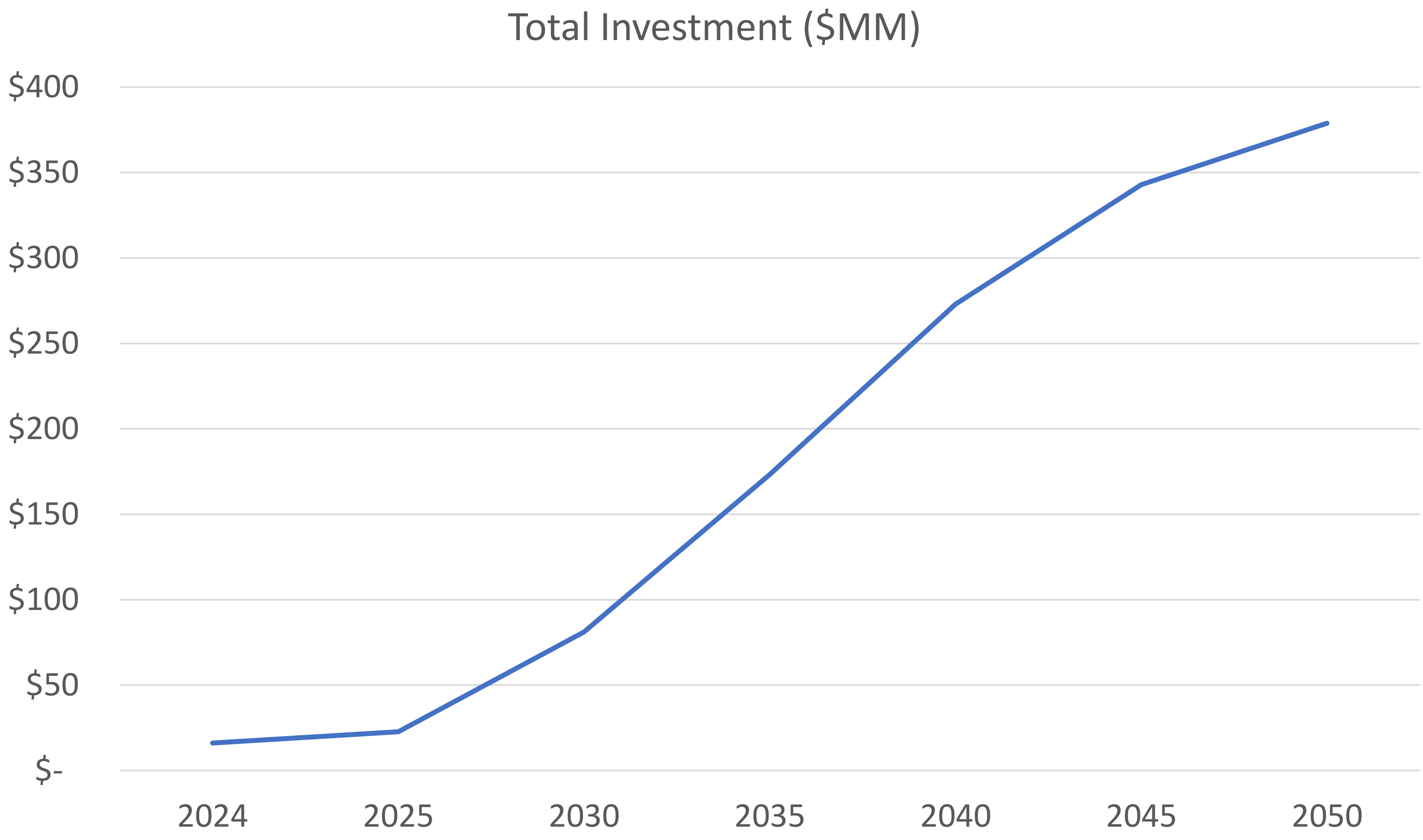
REFERENCE SCENARIO: **TRANSPORTATION**, WEST OREGON*

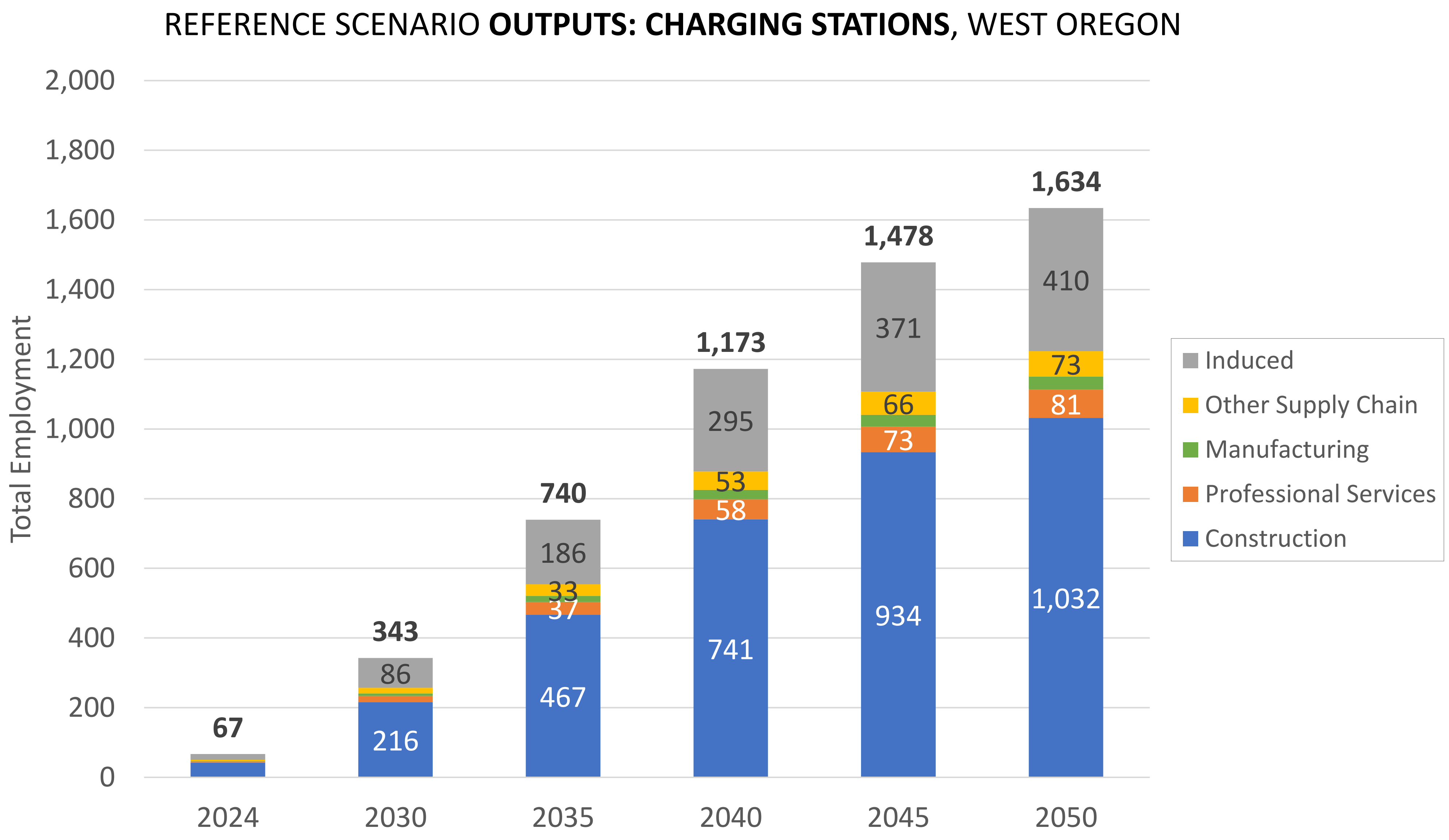
SUB-SECTOR	2024	2030	2035	2040	2045	2050
Growing Sub-Sectors						
Charging Stations	67	343	740	1,173	1,478	1,634
Vehicle Manufacturing	6,289	6,289	6,299	6,342	6,388	6,409
Wholesale Trade Parts	6,409	6,714	6,892	7,094	7,343	7,599
Sub-total	**12,765**	**13,346**	**13,930**	**14,608**	**15,209**	**15,642**
Change		**581**	**1,165**	**1,843**	**2,444**	**2,877**
Displacement Sub-Sectors						
Fueling Stations	13,031	10,745	8,238	6,037	4,808	4,328
Vehicle Maintenance	14,716	13,845	12,311	10,681	9,586	9,238
Sub-total	**27,747**	**24,590**	**20,549**	**16,718**	**14,394**	**13,566**
Change		**-3,157**	**-7,198**	**-11,029**	**-13,353**	**-14,181**
Transportation OVERALL	**40,513**	**37,936**	**34,480**	**31,327**	**29,603**	**29,208**
Net Change from 2024		**-2,576**	**-6,033**	**-9,186**	**-10,909**	**-11,304**

**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

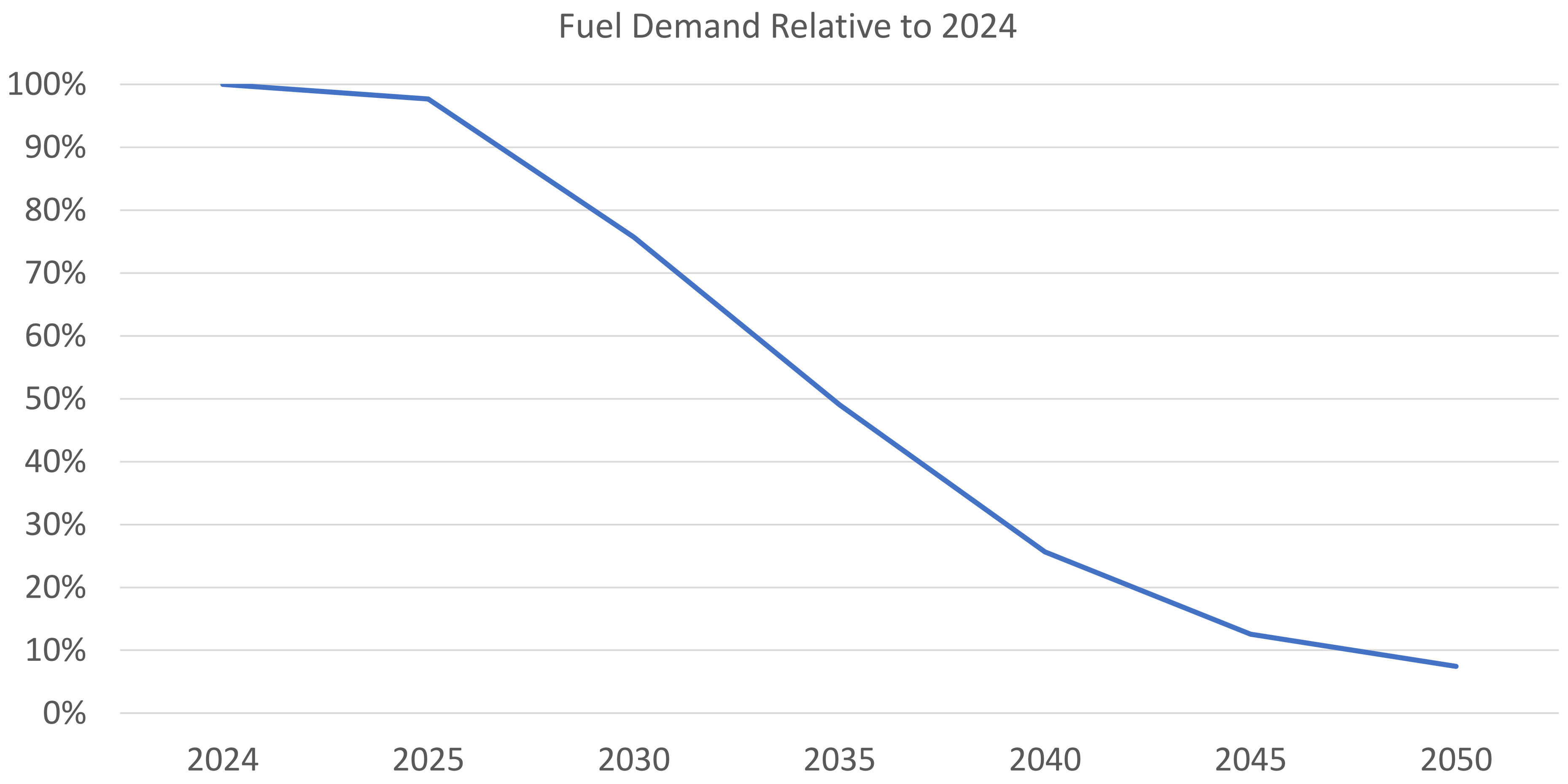

REFERENCE SCENARIO: **TRANSPORTATION – TOTALS**, WEST OREGON
Total Employment
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2024
2030
2035
2040
2045
2050
40,513
37,936
34,480
31,327
29,603
29,208
9,582
9,026
8,268
7,574
7,201
7,121
24,697
22,683
19,934
17,348
15,872
15,473
4,565
4,568
4,580
4,619
4,654
4,672
1,574
1,399
1,198
1,021
924
893
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

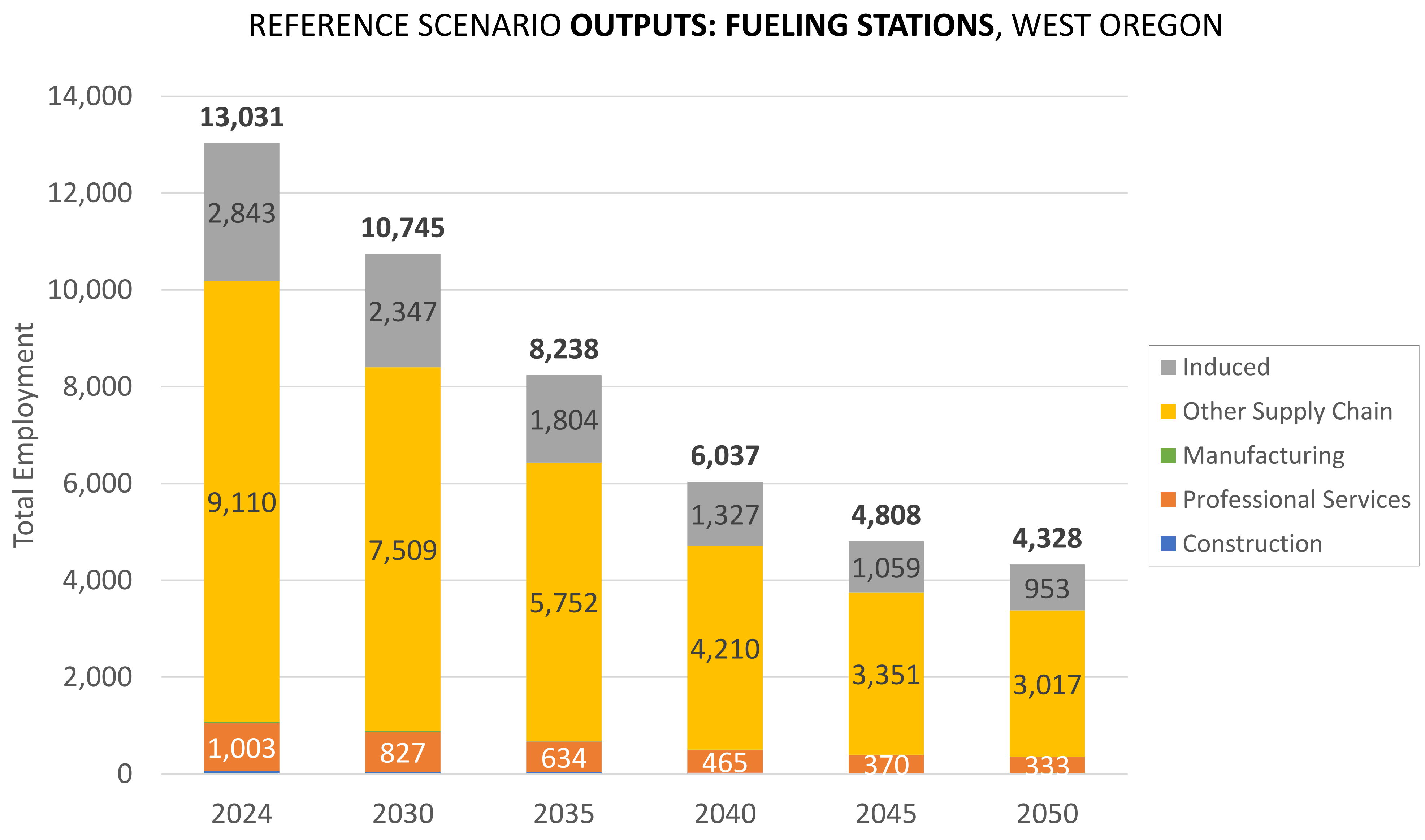
REFERENCE SCENARIO **INPUTS: CHARGING STATIONS**, WEST OREGON



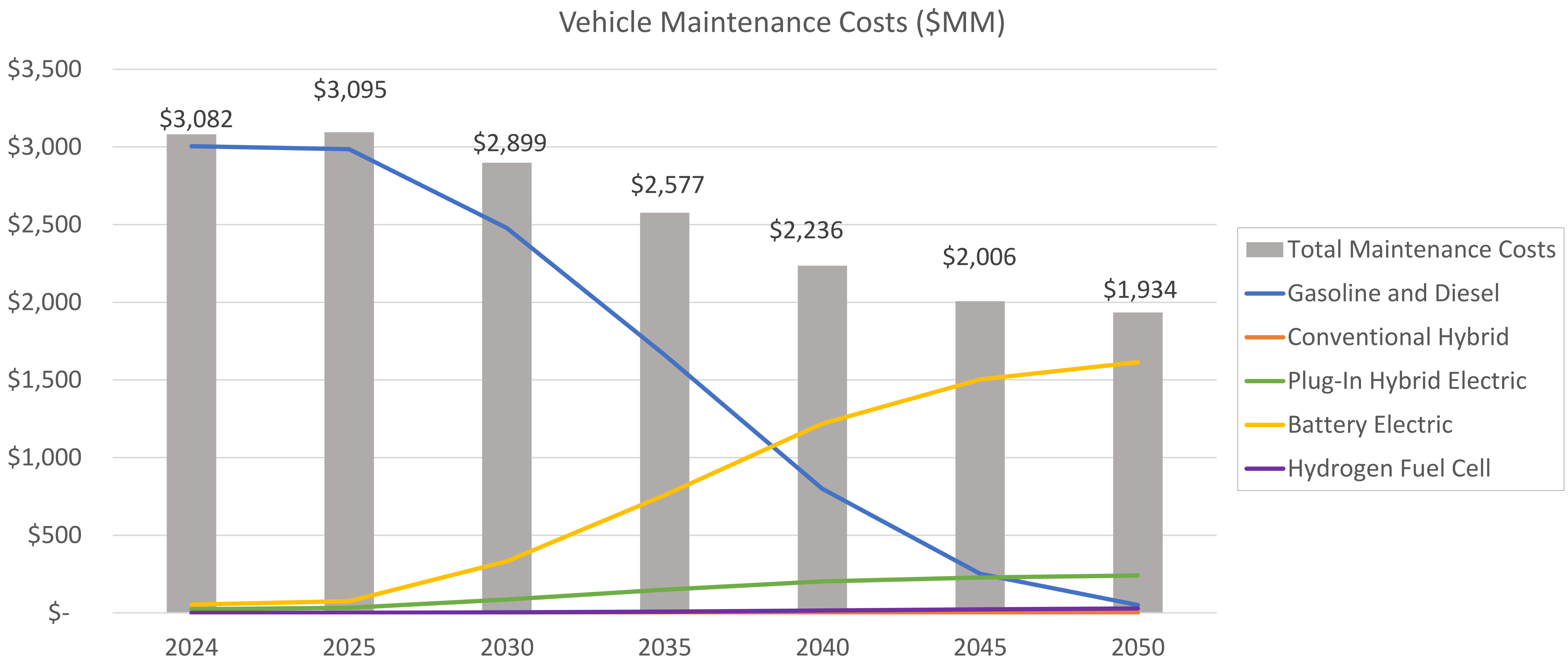

REFERENCE SCENARIO OUTPUTS: CHARGING STATIONS, WEST OREGON
Total Employment
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2024
2030
2035
2040
2045
2050
67
343
86
216
740
186
33
37
467
1,173
295
53
58
741
1,478
371
66
73
934
1,634
410
73
81
1,032
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

REFERENCE SCENARIO **INPUTS: FUELING STATIONS**, WEST OREGON

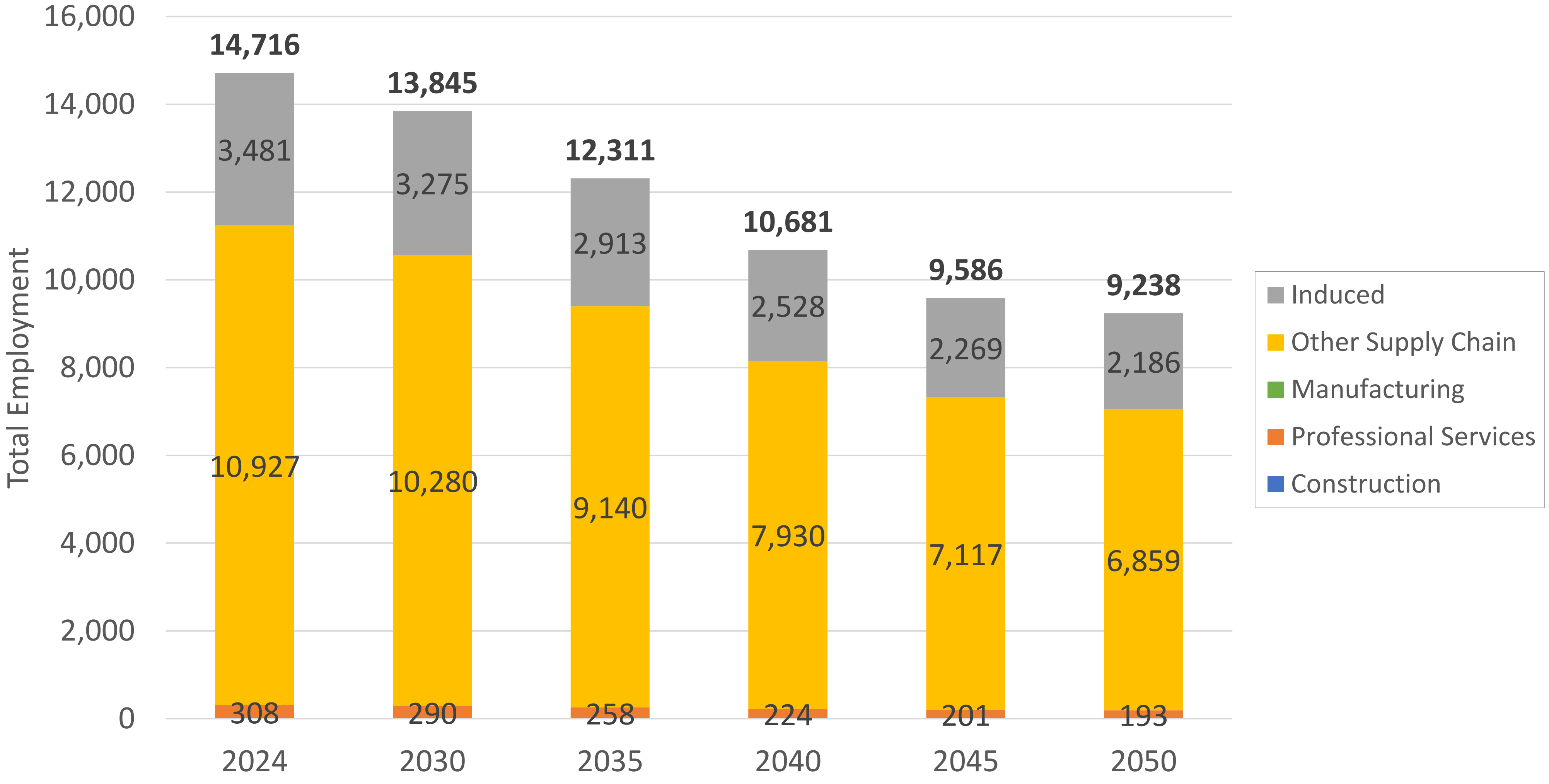



REFERENCE SCENARIO **OUTPUTS: FUELING STATIONS**, WEST OREGON
Total Employment
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
13,031
2,843
9,110
1,003
10,745
2,347
7,509
827
8,238
1,804
5,752
634
6,037
1,327
4,210
465
4,808
1,059
3,351
370
4,328
953
3,017
333
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

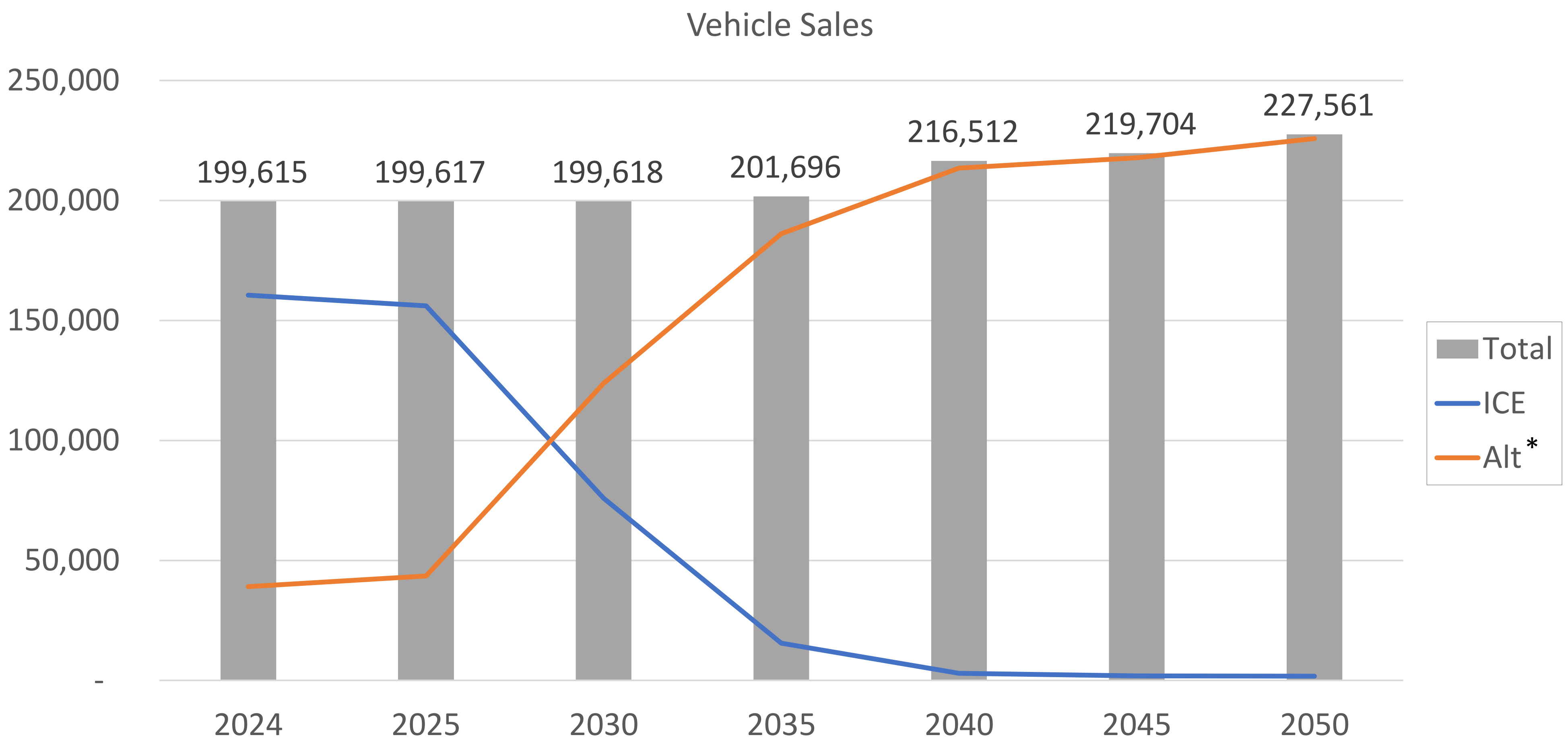
REFERENCE SCENARIO **INPUTS: VEHICLE MAINTENANCE**, WEST OREGON



REFERENCE SCENARIO **OUTPUTS: VEHICLE MAINTENANCE**, WEST OREGON

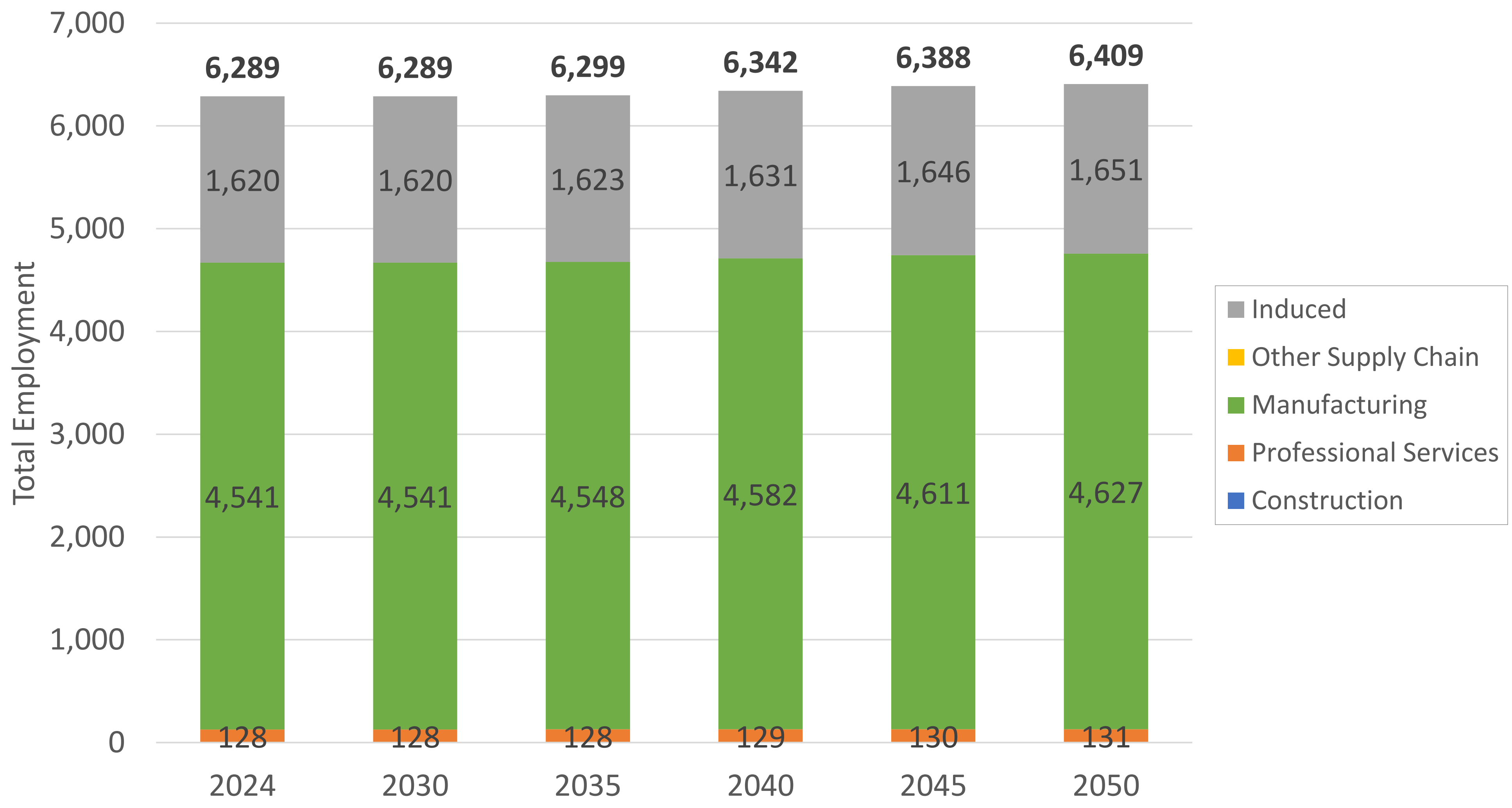


REFERENCE SCENARIO **INPUTS: VEHICLE MANUFACTURING**, WEST OREGON

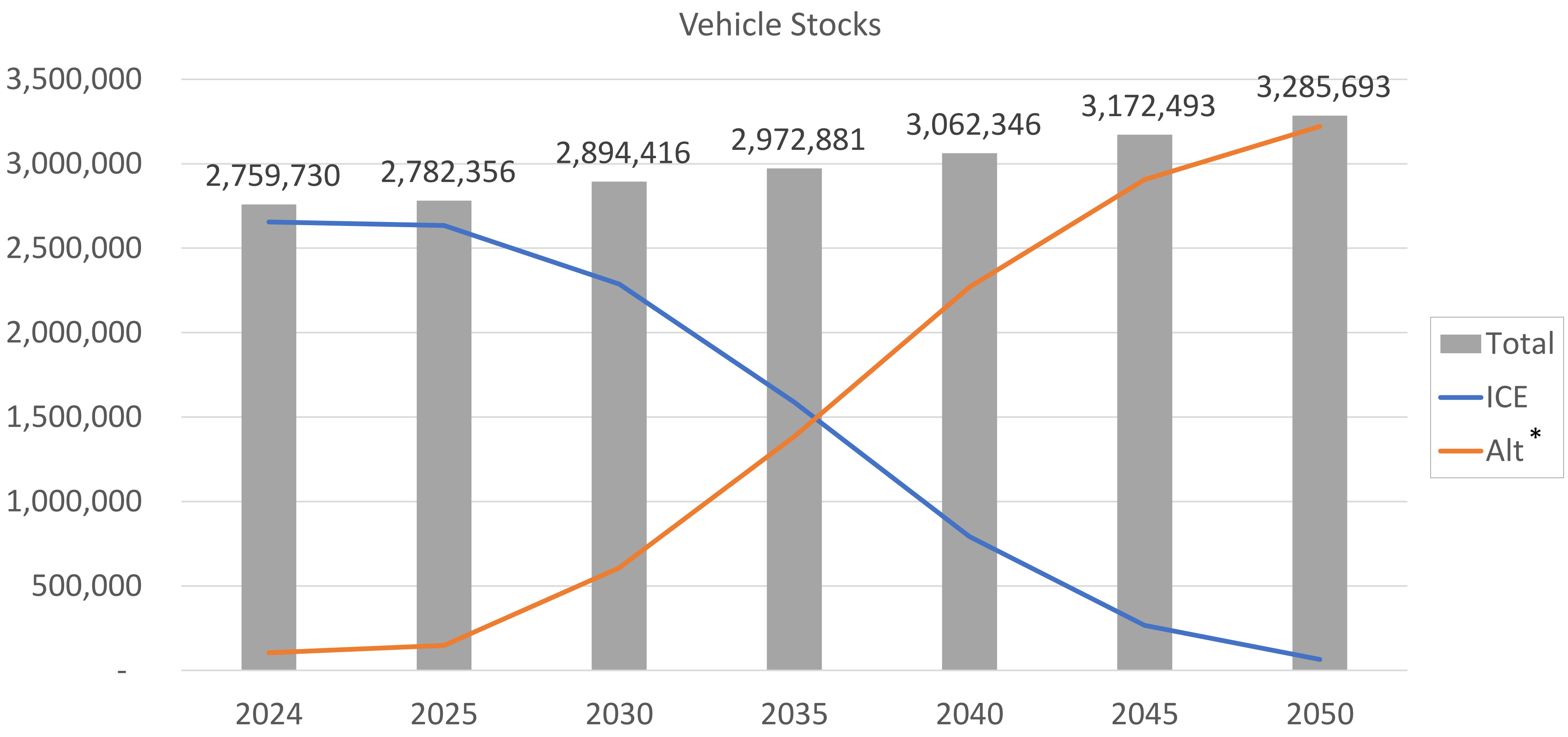


* Alt vehicle technologies include battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles.

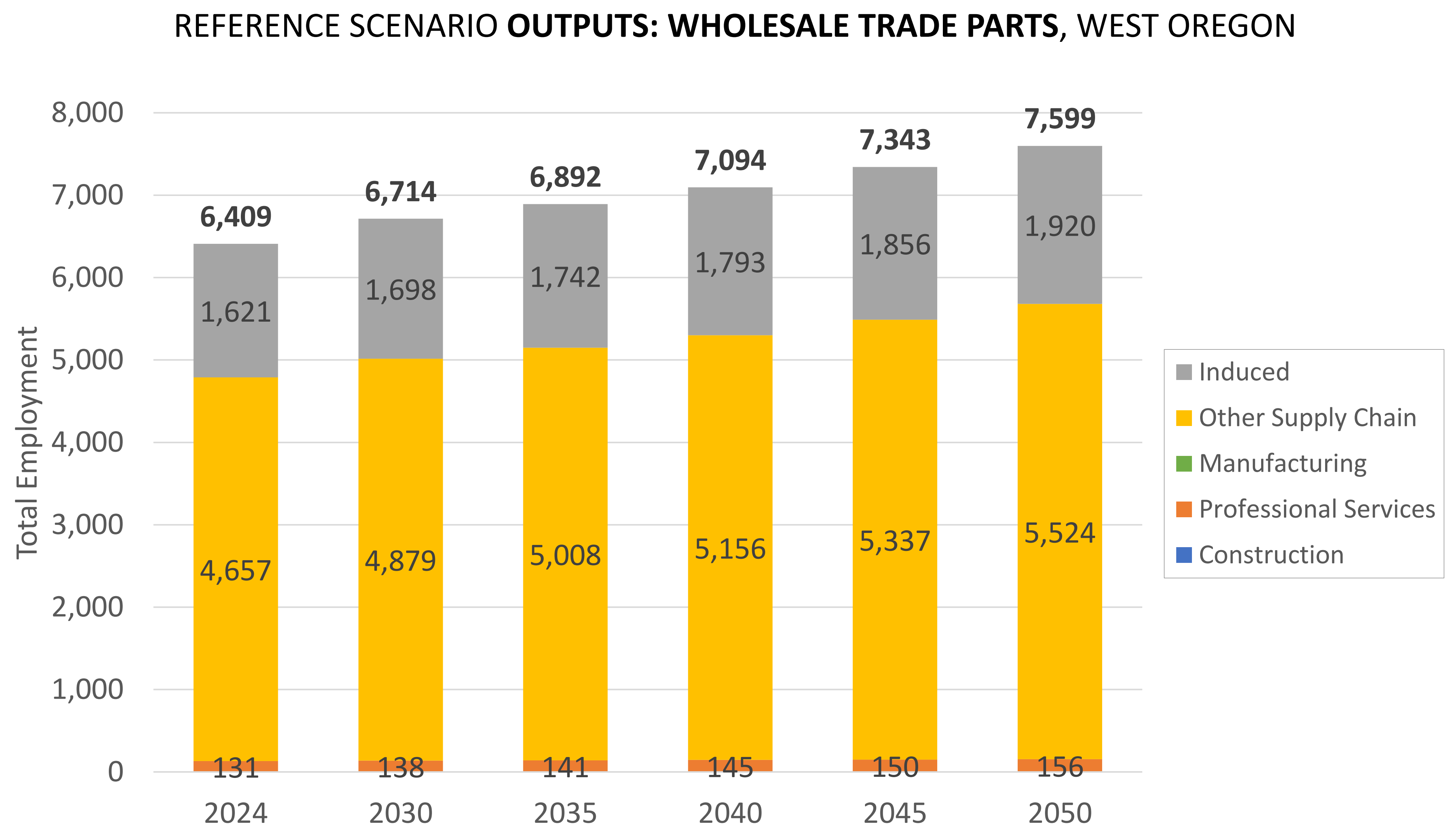
REFERENCE SCENARIO **OUTPUTS: VEHICLE MANUFACTURING**, WEST OREGON



REFERENCE SCENARIO **INPUTS: WHOLESALE TRADE PARTS**, WEST OREGON



* Alt vehicle technologies include battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles.


REFERENCE SCENARIO **OUTPUTS: WHOLESALE TRADE PARTS**, WEST OREGON
Total Employment
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
6,409
6,714
6,892
7,094
7,343
7,599
1,621
1,698
1,742
1,793
1,856
1,920
4,657
4,879
5,008
5,156
5,337
5,524
131
138
141
145
150
156
2024
2030
2035
2040
2045
2050
Induced
Other Supply Chain
Manufacturing
Professional Services
Construction

Part 4.1

Reference Scenario Secondary Employment Outputs (SEOs) – Oregon

Oregon Energy Strategy

Part 4: SEOs Key Findings

Top 15 Occupations by Demand in 2035 by Sector

Oregon

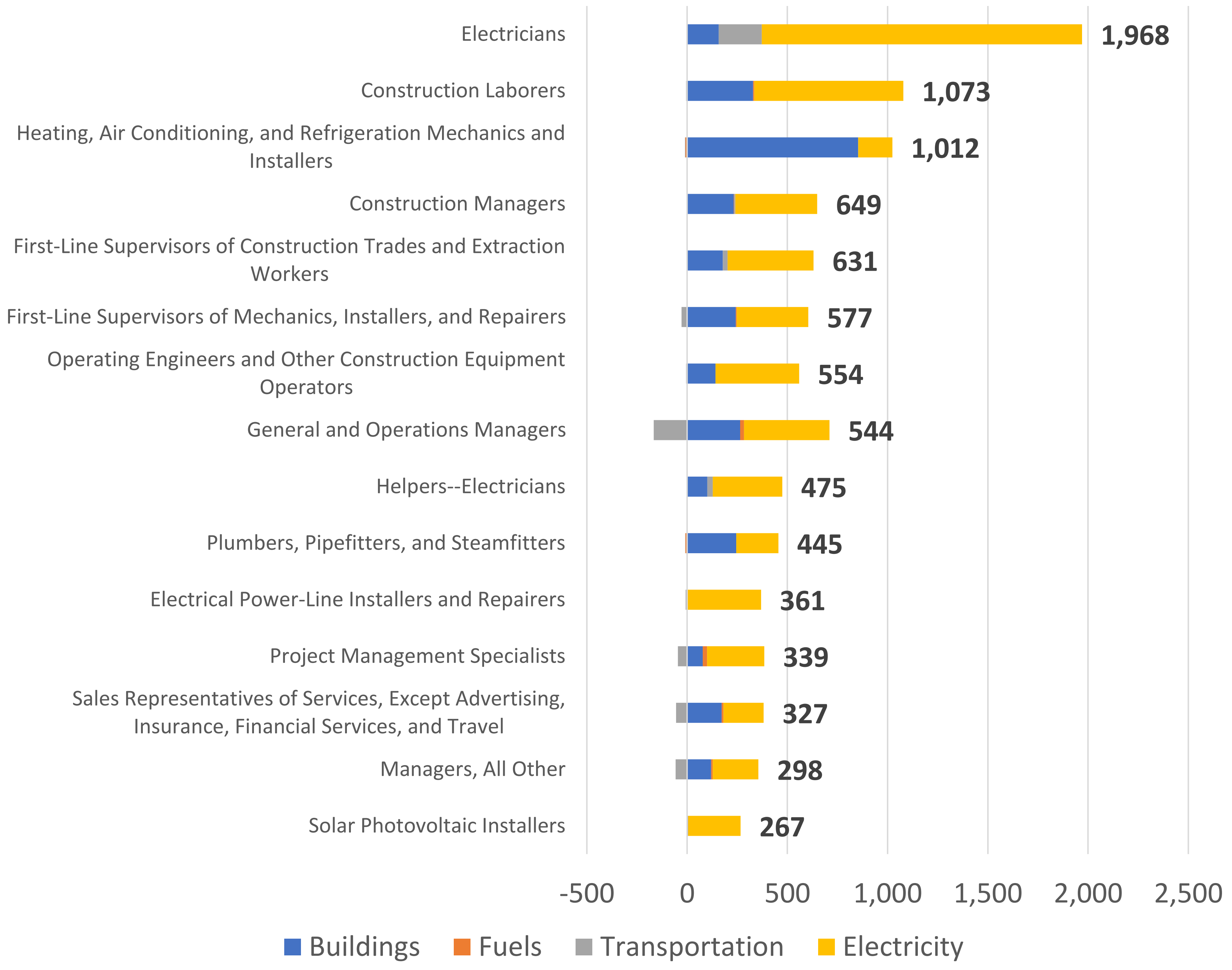
SOC Code	Occupation Title	Buildings Net New Jobs by 2035	Fuels Net New Jobs by 2035	Transportation Net New Jobs by 2035	Electricity Net New Jobs by 2035	Total New Jobs by 2035	Current Energy Sector Employment	Percent Growth Over Current Energy Sector Employment
47-2111	Electricians	158	-3	214	1,598	1,968	3,086	64%
47-2061	Construction Laborers	330	5	-5	744	1,073	2,774	39%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	854	-8	-3	170	1,012	4,373	23%
11-9021	Construction Managers	232	2	6	408	649	1,828	35%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	178	0	24	429	631	1,531	41%
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	243	4	-28	357	577	2,267	25%
47-2073	Operating Engineers and Other Construction Equipment Operators	142	0	-4	417	554	1,298	43%
11-1021	General and Operations Managers	265	19	-166	427	544	4,160	13%
47-3013	Helpers--Electricians	100	0	27	347	475	122	390%
47-2152	Plumbers, Pipefitters, and Steamfitters	245	-8	-2	210	445	2,478	18%
49-9051	Electrical Power-Line Installers and Repairers	0	-3	-5	369	361	1,034	35%
13-1082	Project Management Specialists	78	21	-46	286	339	1,559	22%
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	173	9	-55	200	327	1,859	18%
11-9199	Managers, All Other	120	8	-58	227	298	1,632	18%
47-2231	Solar Photovoltaic Installers	0	0	4	262	267	302	88%

Oregon Energy Strategy

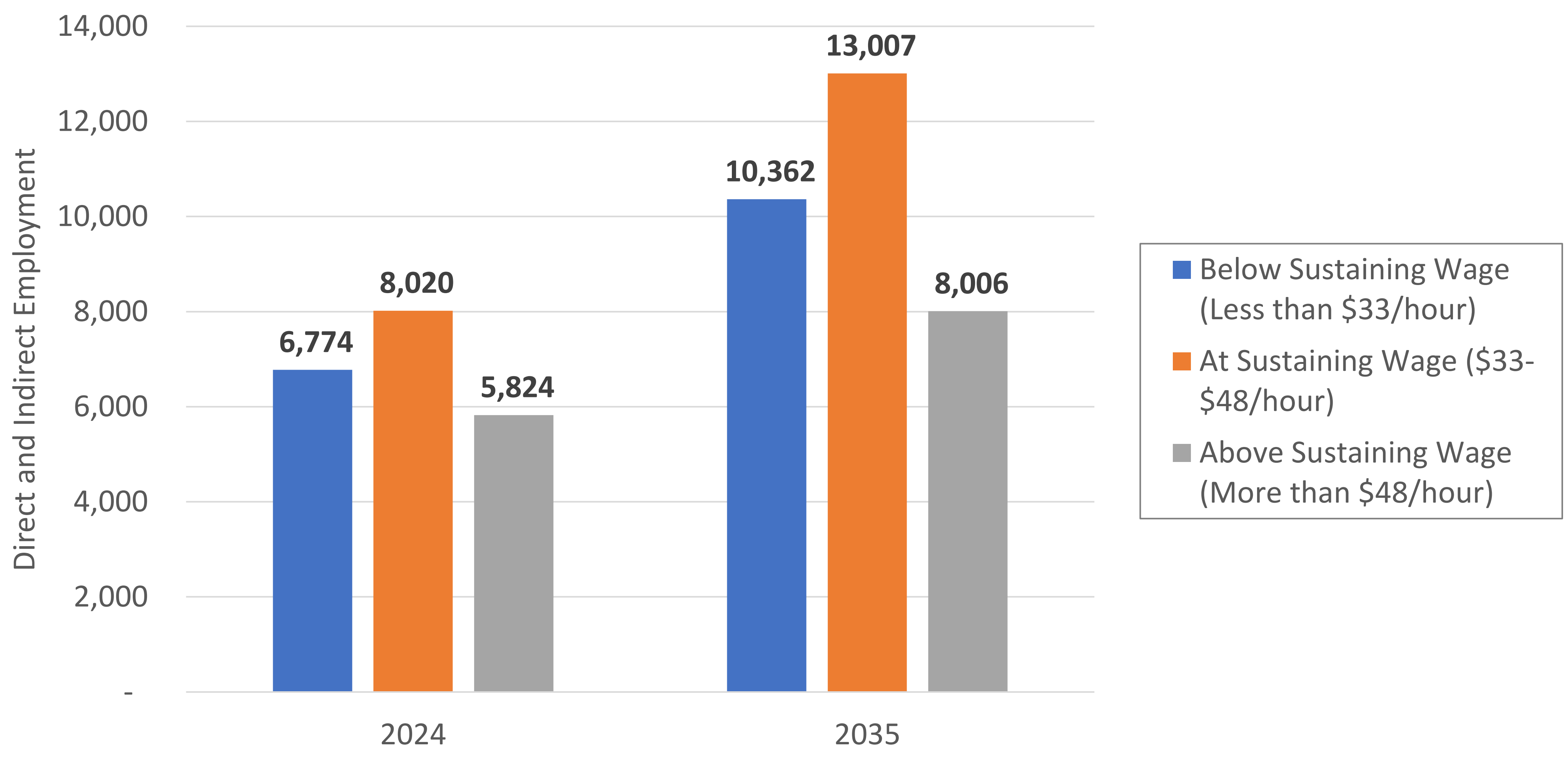
Part 4: SEOs Key Findings

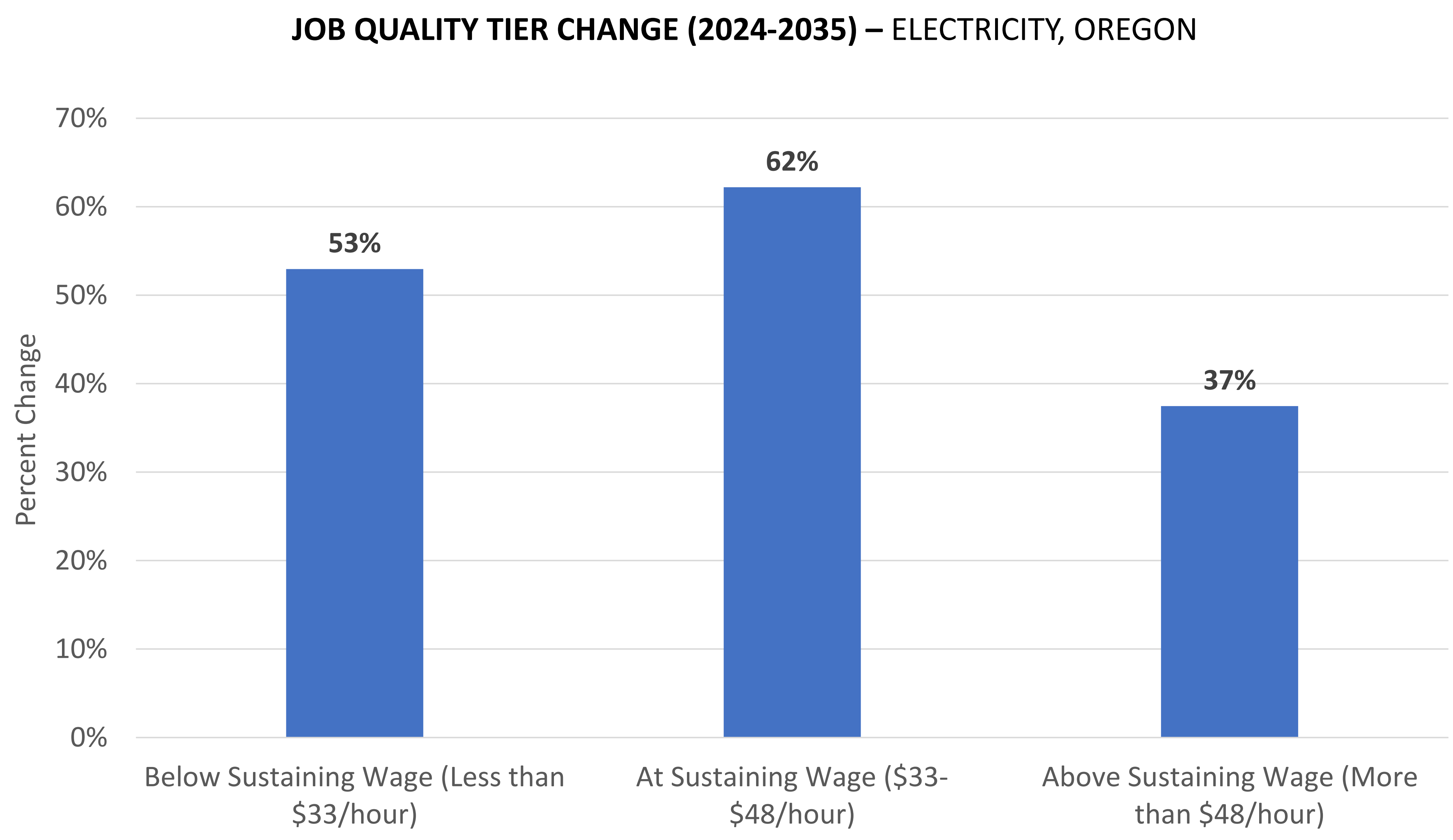
Top 15 Occupations by Demand in 2035 by Sector

Oregon

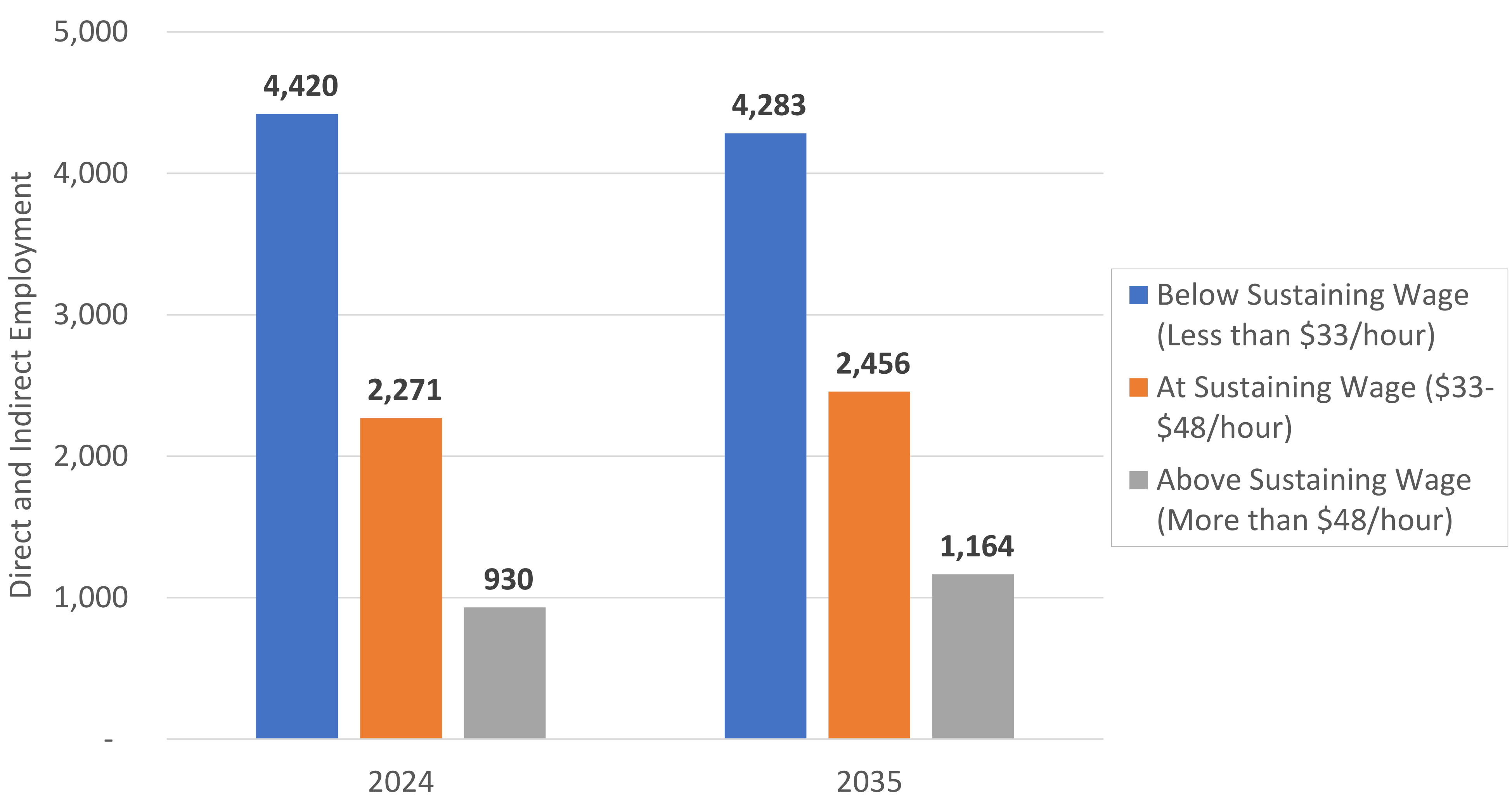


TOTAL EMPLOYMENT BY WAGE TIER – ELECTRICITY, OREGON

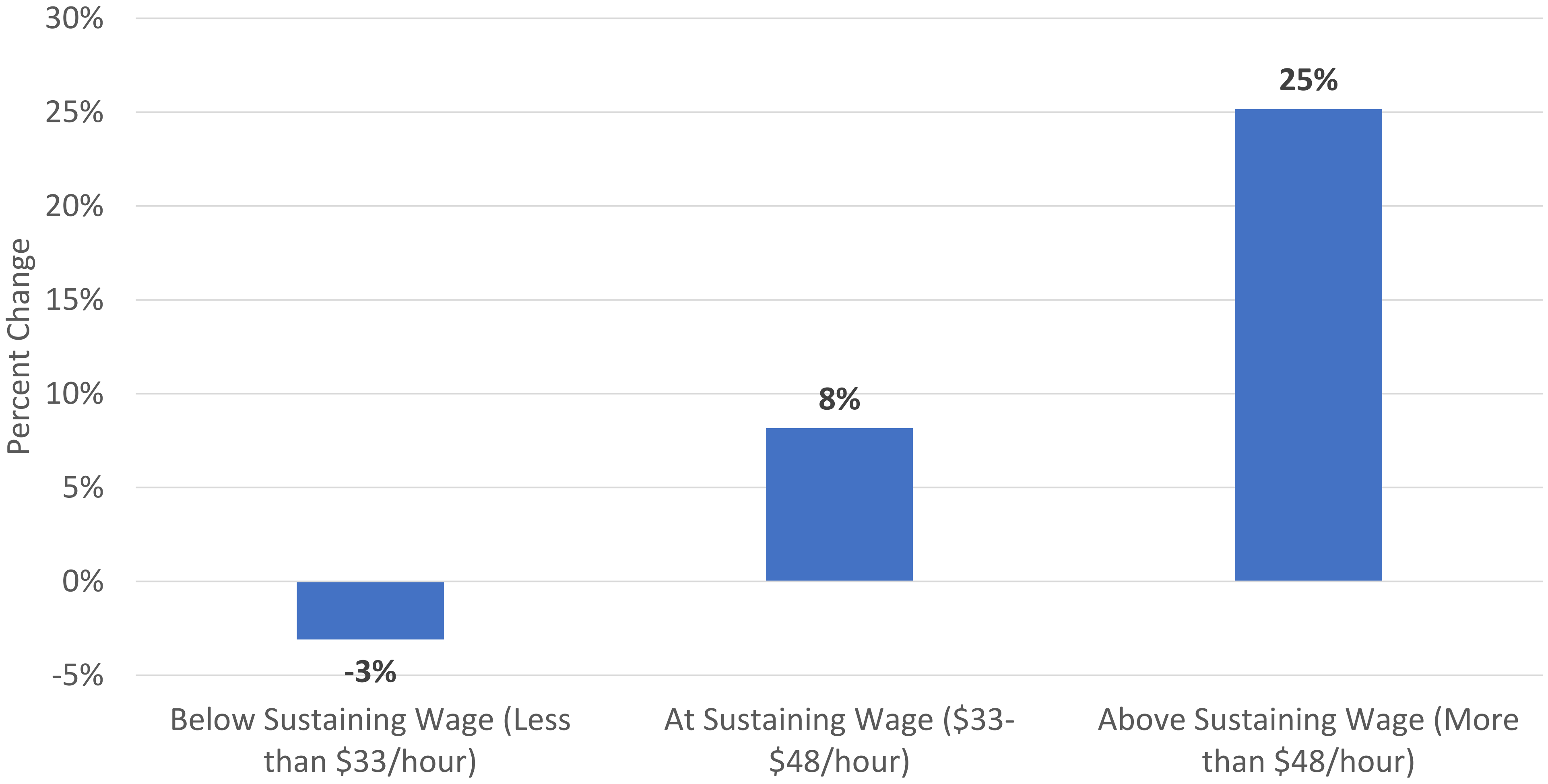


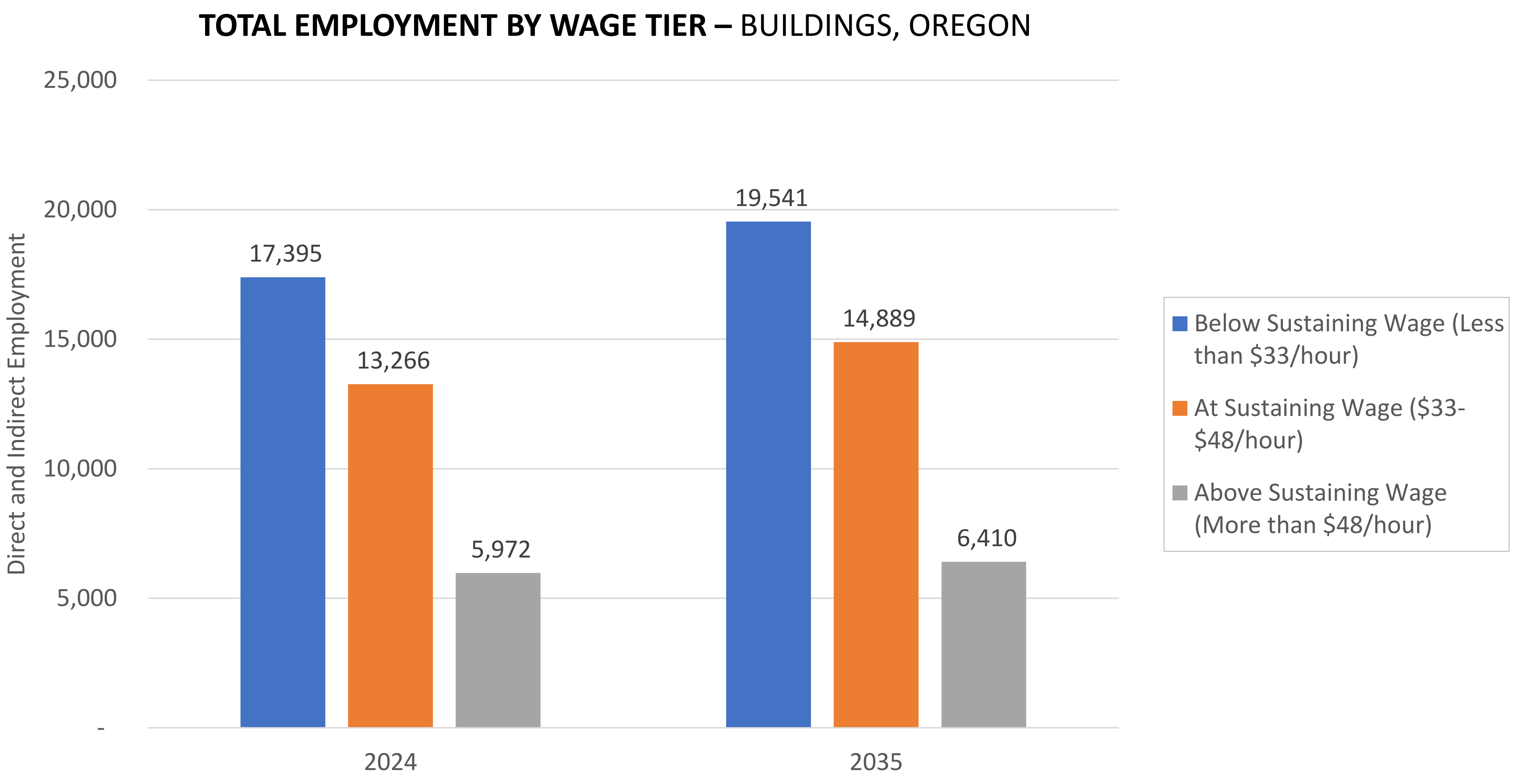

JOB QUALITY TIER CHANGE (2024-2035) – ELECTRICITY, OREGON
Percent Change
70%
60%
50%
40%
30%
20%
10%
0%
53%
62%
37%
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33-$48/hour)
Above Sustaining Wage (More than $48/hour)

TOTAL EMPLOYMENT BY WAGE TIER – FUELS, OREGON

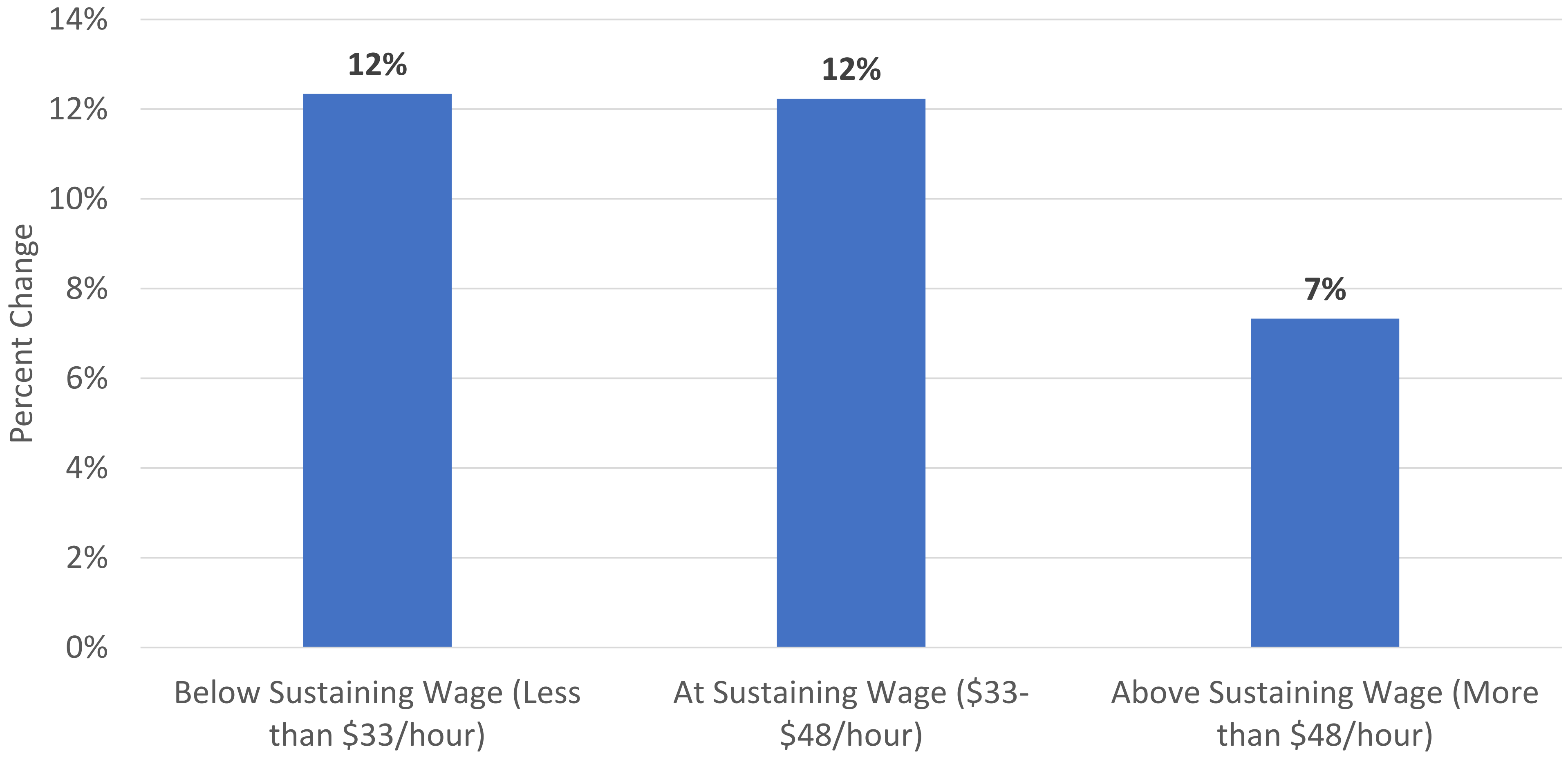


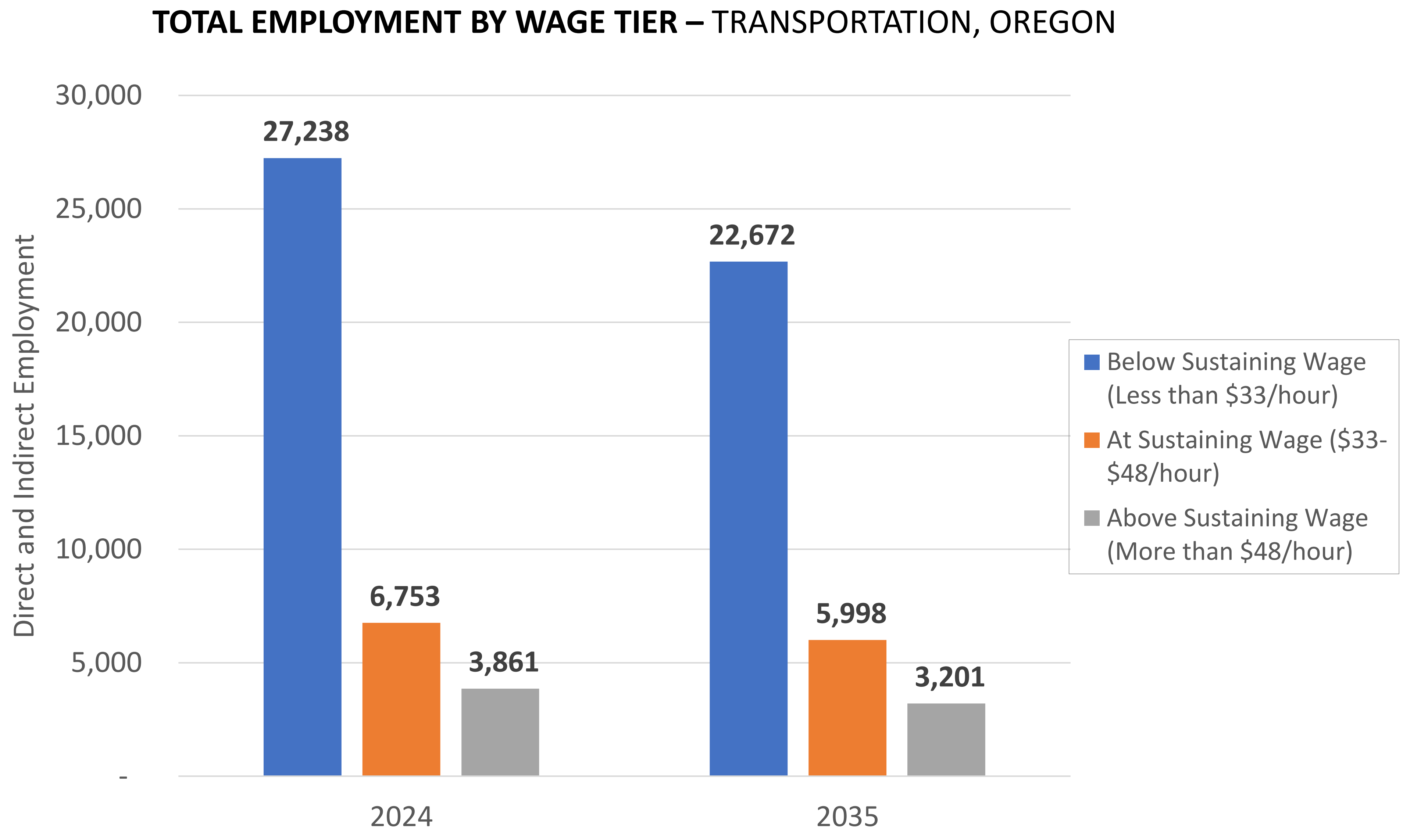
JOB QUALITY TIER CHANGE (2024-2035) – FUELS, OREGON



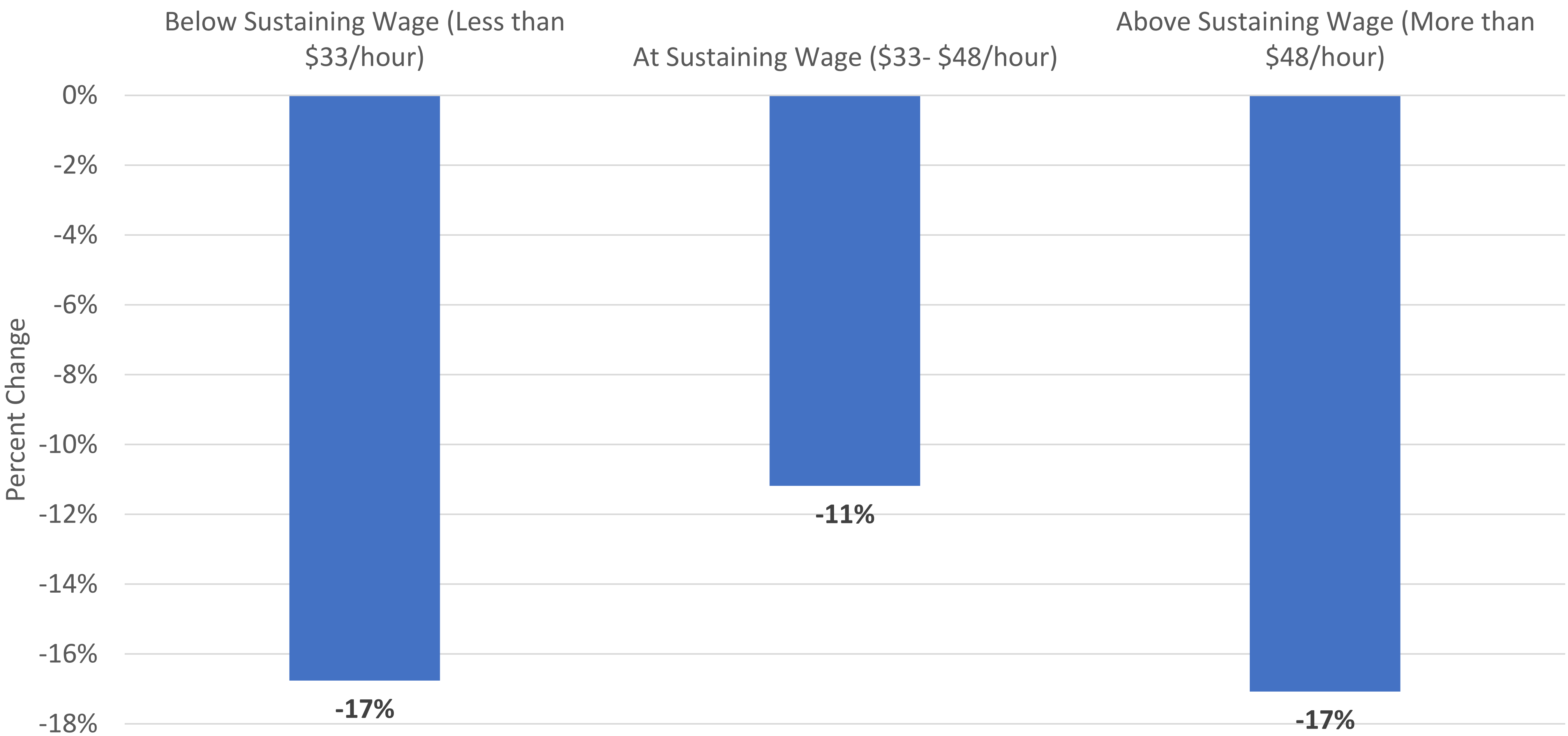

TOTAL EMPLOYMENT BY WAGE TIER – BUILDINGS, OREGON
Direct and Indirect Employment
25,000
20,000
15,000
10,000
5,000
-
17,395
13,266
5,972
19,541
14,889
6,410
2024
2035
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33-$48/hour)
Above Sustaining Wage (More than $48/hour)

JOB QUALITY TIER CHANGE (2024-2035) – BUILDINGS, OREGON




TOTAL EMPLOYMENT BY WAGE TIER – TRANSPORTATION, OREGON
30,000
25,000
20,000
15,000
10,000
5,000
-
Direct and Indirect Employment
27,238
6,753
3,861
22,672
5,998
3,201
2024
2035
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33-$48/hour)
Above Sustaining Wage (More than $48/hour)

JOB QUALITY TIER CHANGE (2024-2035) – TRANSPORTATION, OREGON



Part 4.2

Reference Scenario Secondary Employment Outputs (SEOs) – East Oregon*

Note: *EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

Oregon Energy Strategy

Part 4: SEOs Key Findings

Top 15 Occupations by Demand in 2035 by Sector

East Oregon

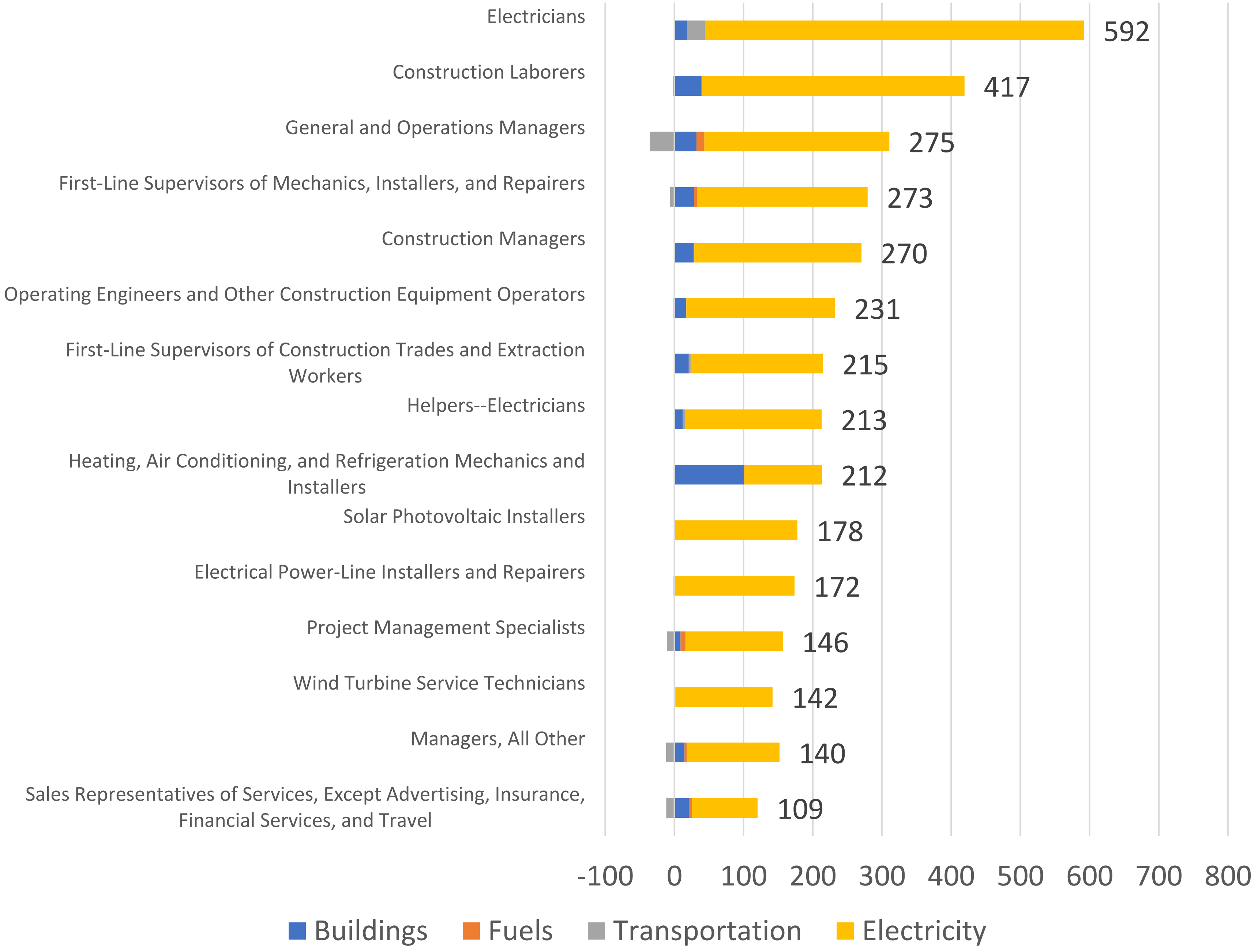
SOC Code	Occupation Title	Buildings Net New Jobs by 2035	Fuels Net New Jobs by 2035	Transportation Net New Jobs by 2035	Electricity Net New Jobs by 2035	Total New Jobs by 2035	Current Energy Sector Employment	Percent Growth Over Current Energy Sector Employment
47-2111	Electricians	19	0	26	548	592	419	141%
47-2061	Construction Laborers	38	2	-2	379	417	327	128%
11-1021	General and Operations Managers	32	12	-36	267	275	567	49%
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	28	4	-6	247	273	283	96%
11-9021	Construction Managers	28	1	0	241	270	206	131%
47-2073	Operating Engineers and Other Construction Equipment Operators	17	1	-1	214	231	158	146%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	21	1	2	191	215	178	120%
47-3013	Helpers--Electricians	12	0	3	198	213	15	1455%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	100	1	-1	112	212	412	52%
47-2231	Solar Photovoltaic Installers	0	0	0	177	178	63	281%
49-9051	Electrical Power-Line Installers and Repairers	0	0	-1	174	172	190	90%
13-1082	Project Management Specialists	9	7	-11	141	146	217	67%
49-9081	Wind Turbine Service Technicians	0	2	0	140	142	45	318%
11-9199	Managers, All Other	15	3	-12	134	140	231	61%
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	21	4	-12	95	109	237	46%

Oregon Energy Strategy

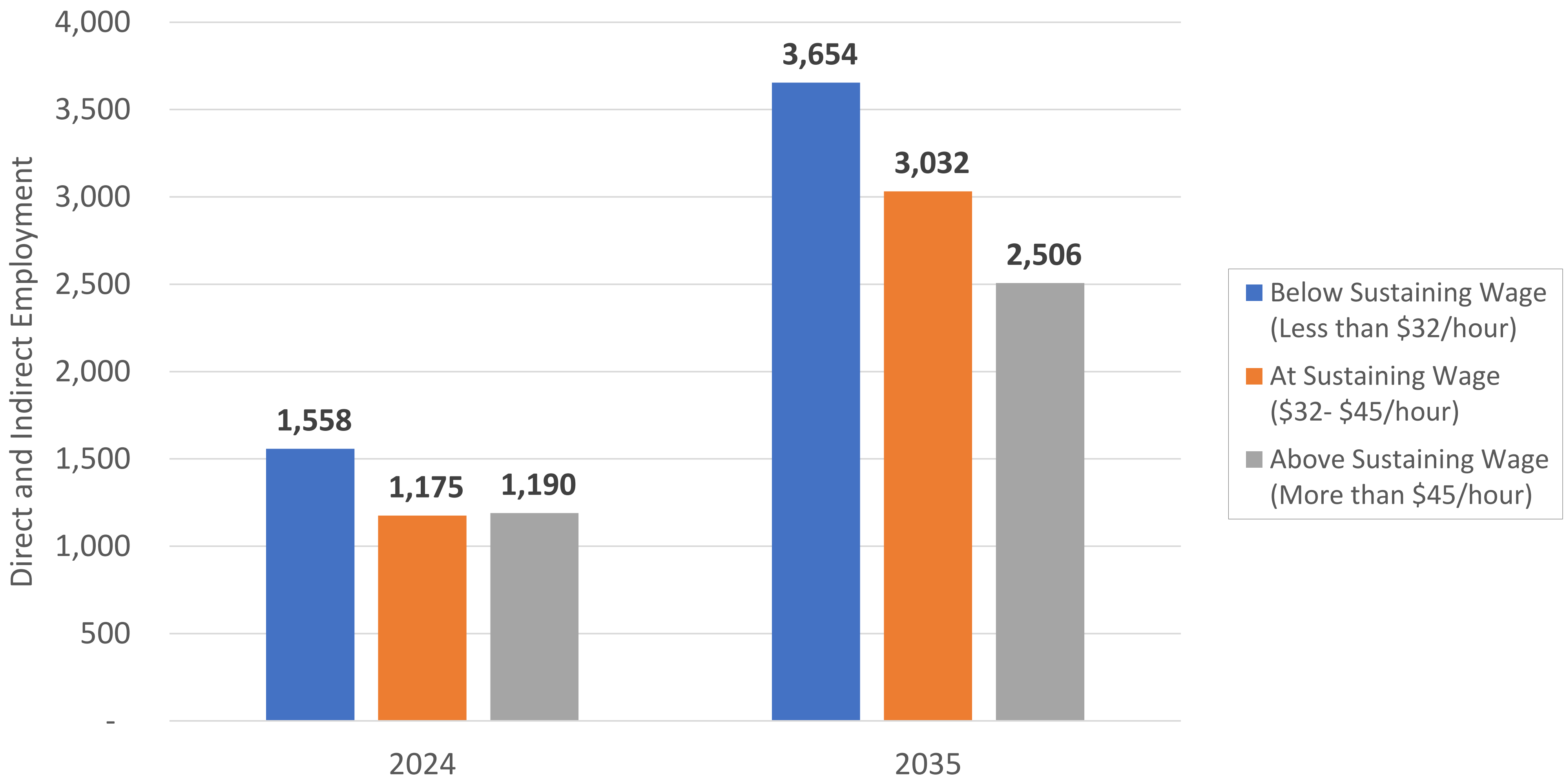
Part 4: SEOs Key Findings

Top 15 Occupations by Demand in 2035 by Sector

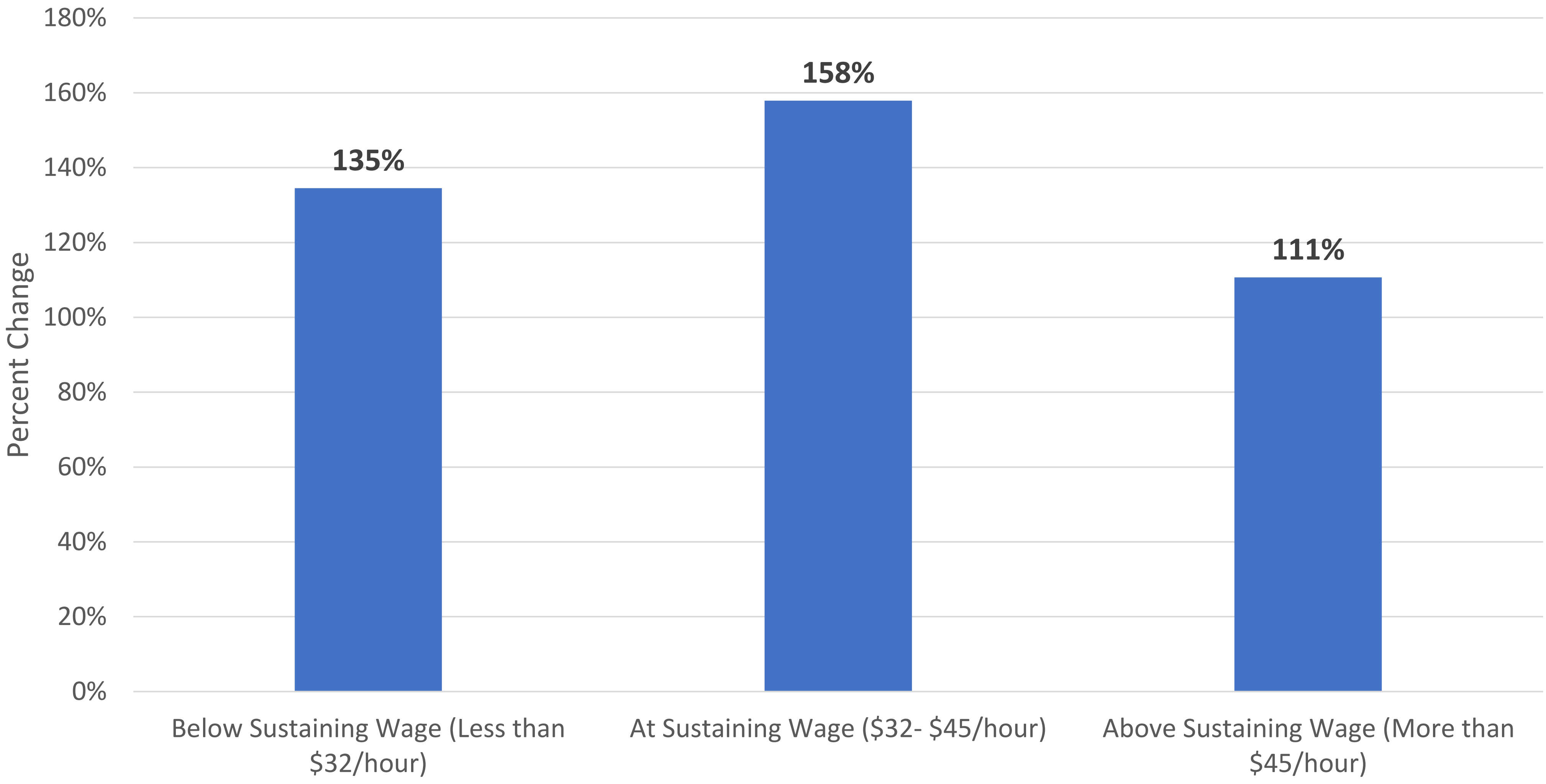
East Oregon



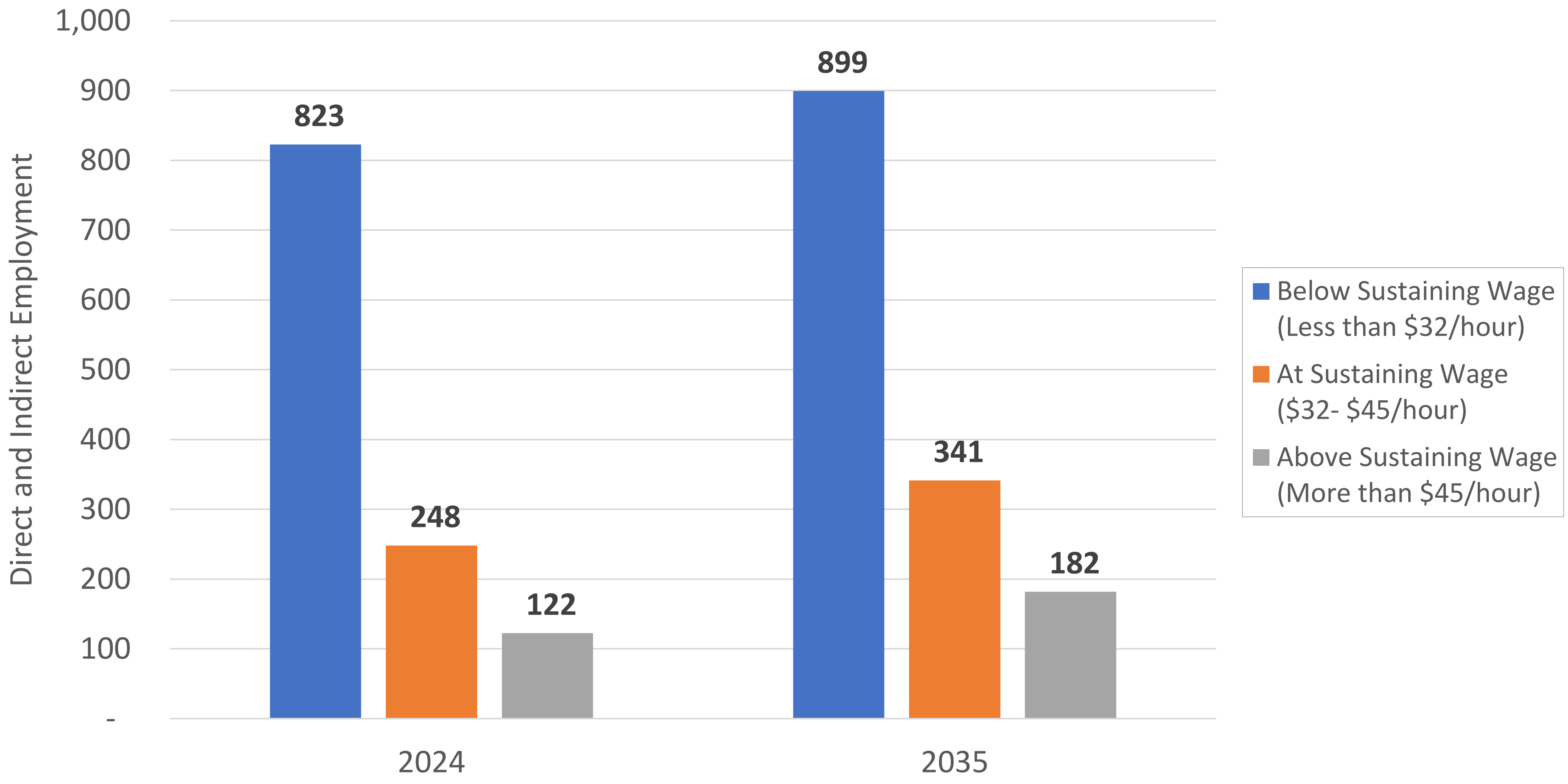
TOTAL EMPLOYMENT BY WAGE TIER – ELECTRICITY, EAST OREGON



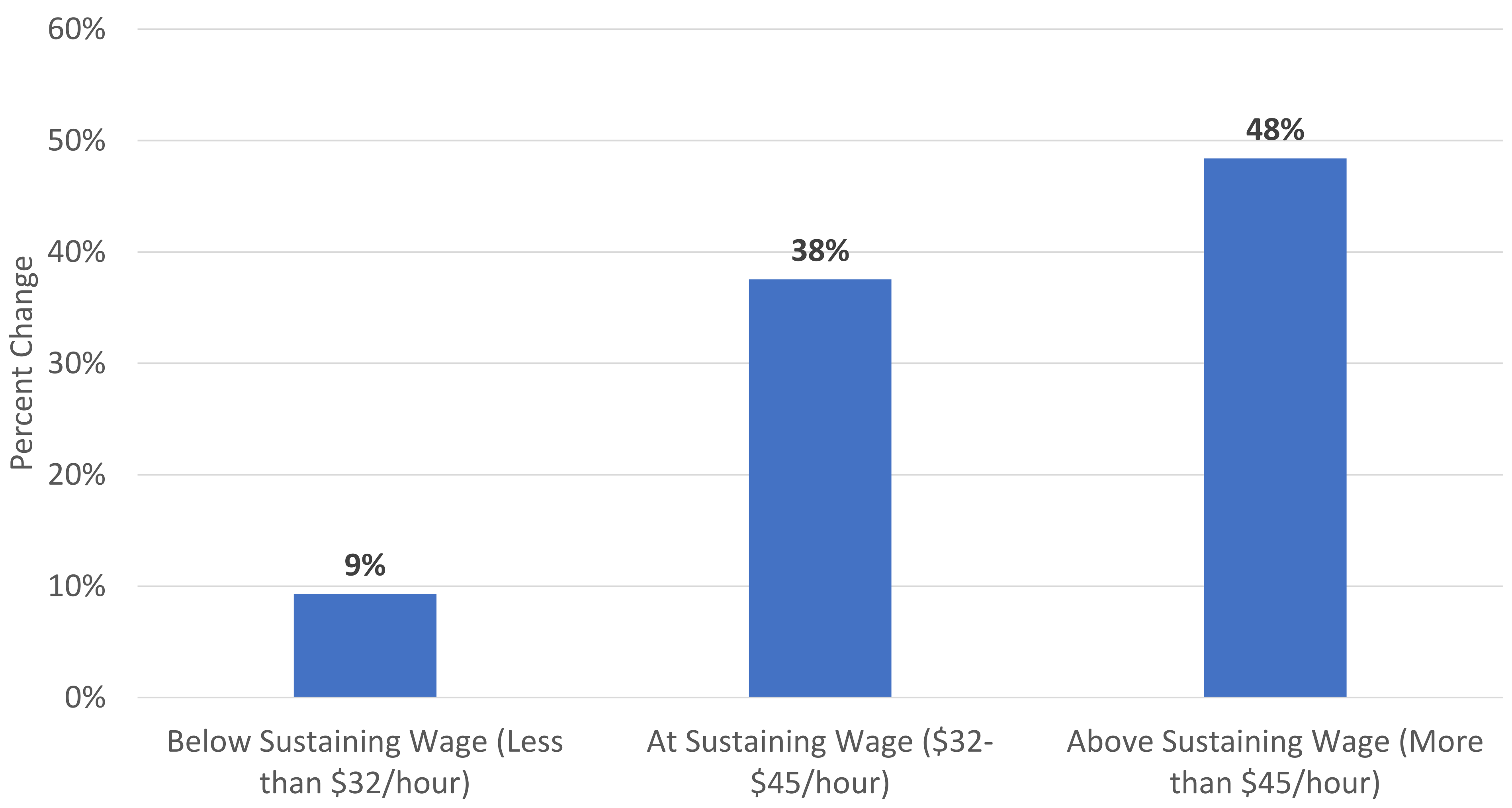
JOB QUALITY TIER CHANGE (2024-2035) – ELECTRICITY, EAST OREGON



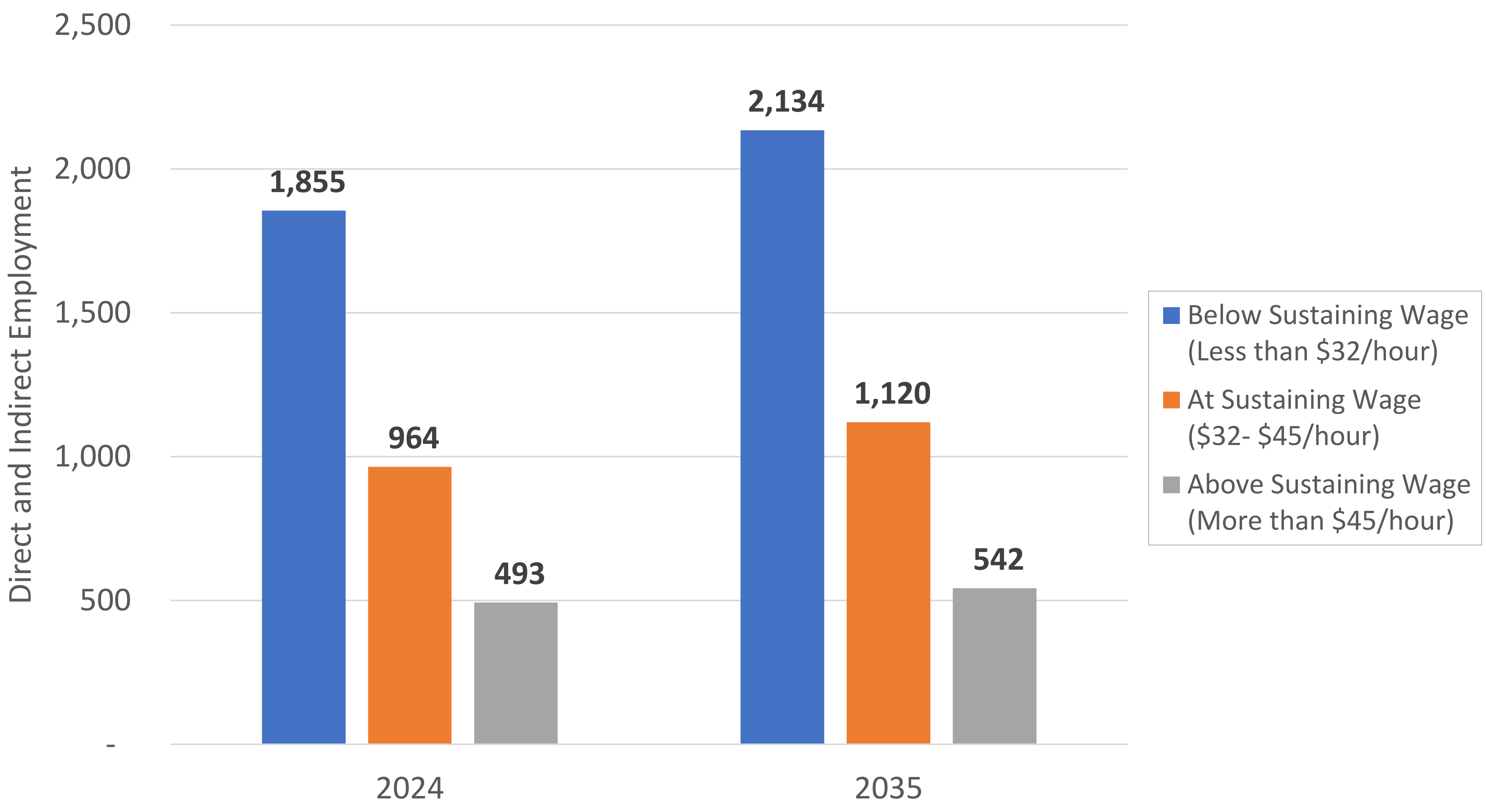
TOTAL EMPLOYMENT BY WAGE TIER – FUELS, EAST OREGON

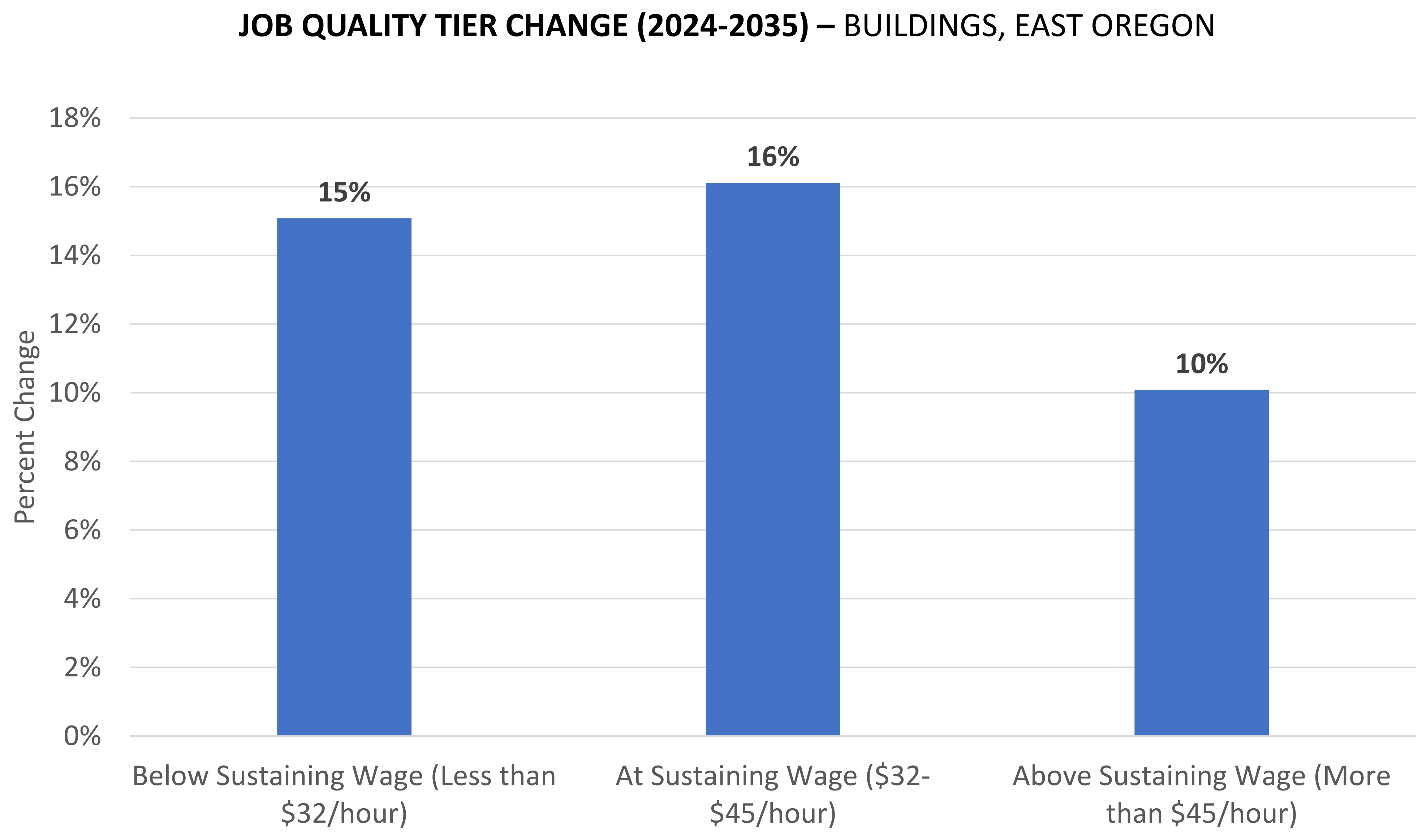


JOB QUALITY TIER CHANGE (2024-2035) – FUELS, EAST OREGON

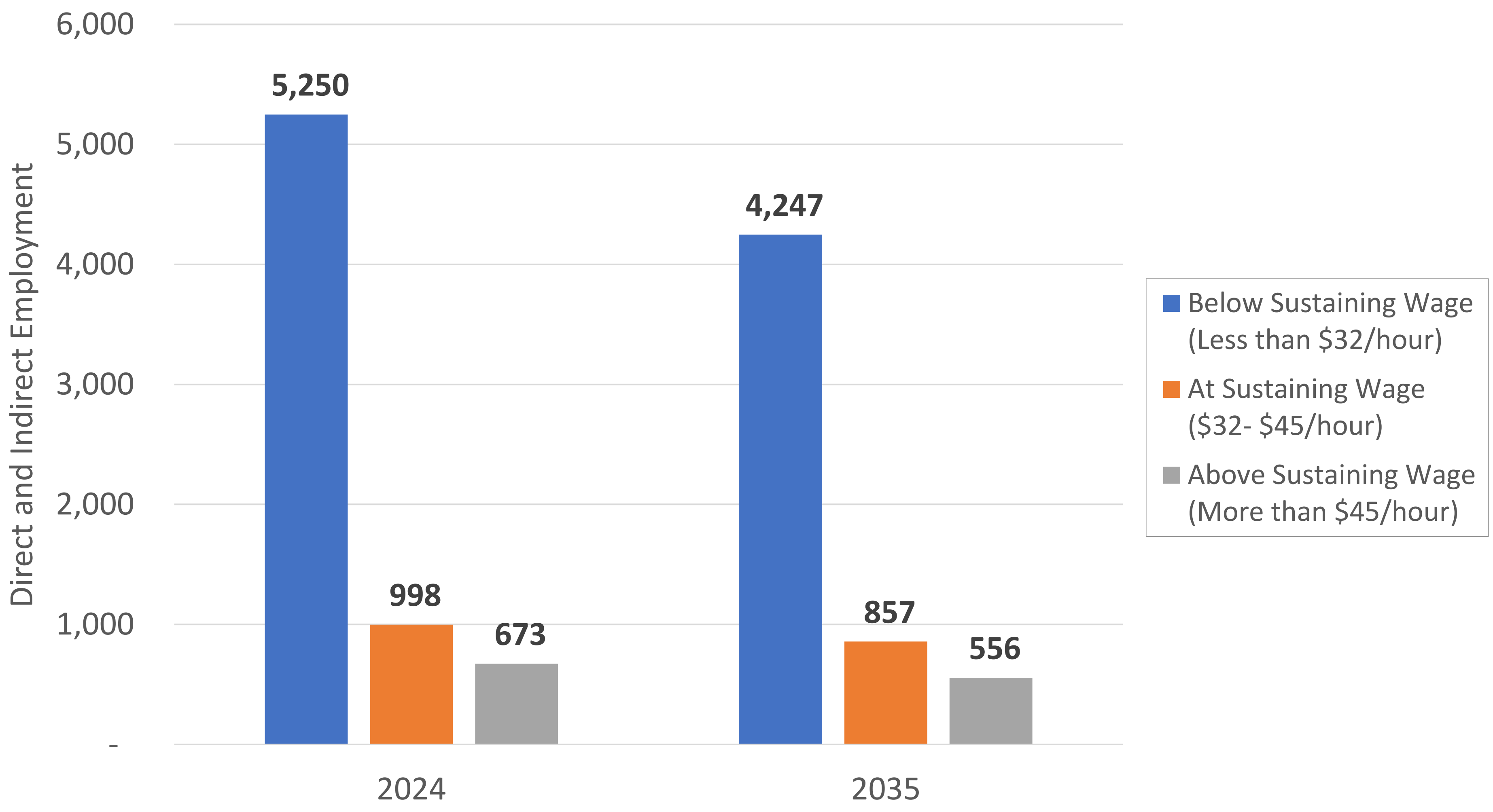


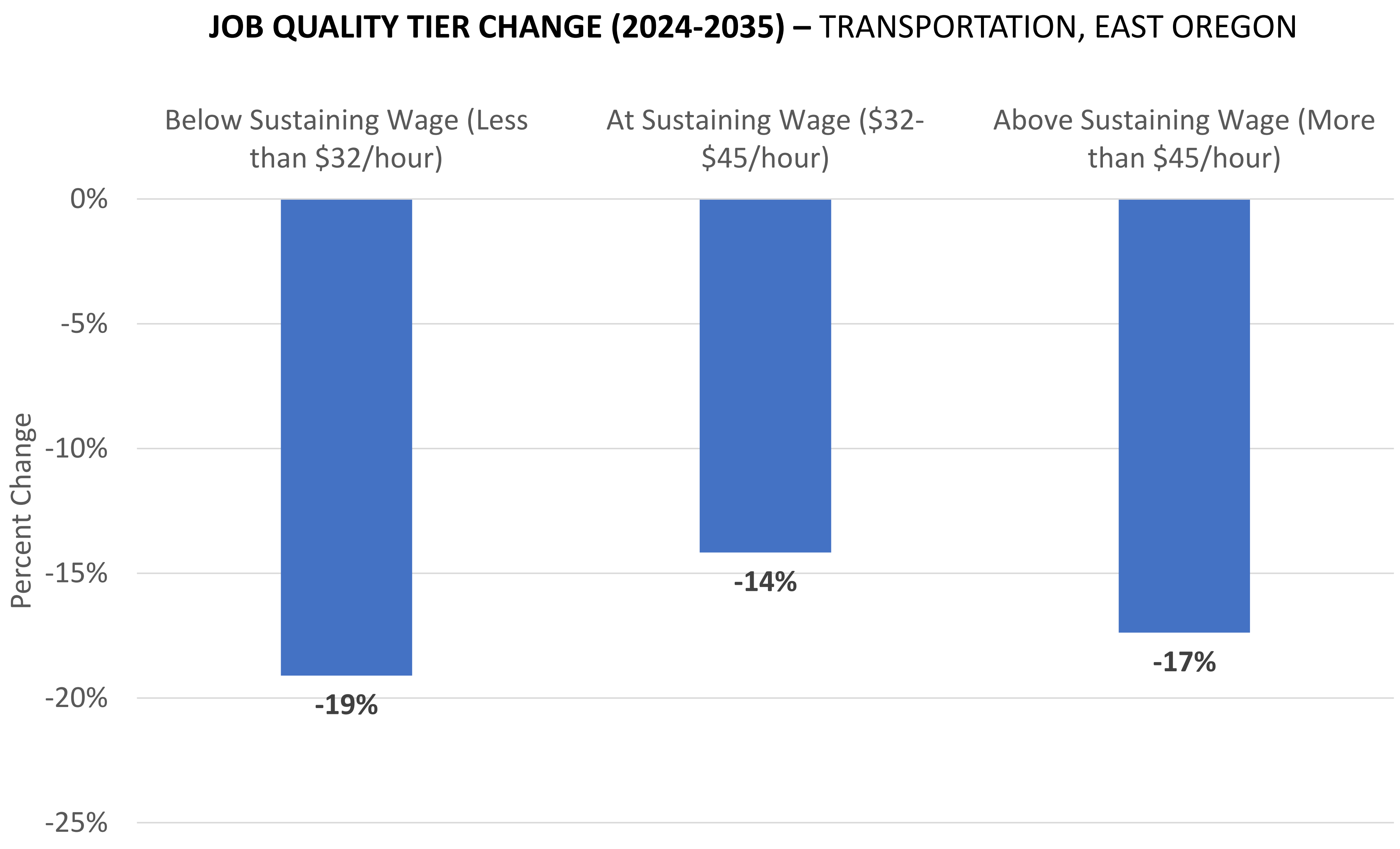
TOTAL EMPLOYMENT BY WAGE TIER – BUILDINGS, EAST OREGON




JOB QUALITY TIER CHANGE (2024-2035) – BUILDINGS, EAST OREGON
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
Percent Change
15%
16%
10%
Below Sustaining Wage (Less than $32/hour)
At Sustaining Wage ($32-$45/hour)
Above Sustaining Wage (More than $45/hour)

TOTAL EMPLOYMENT BY WAGE TIER – TRANSPORTATION, EAST OREGON




JOB QUALITY TIER CHANGE (2024-2035) – TRANSPORTATION, EAST OREGON
Below Sustaining Wage (Less than $32/hour)
At Sustaining Wage ($32-$45/hour)
Above Sustaining Wage (More than $45/hour)
0%
-5%
-10%
-15%
-20%
-25%
Percent Change
-19%
-14%
-17%

Part 4.3

Reference Scenario Secondary Employment Outputs (SEOs) – West Oregon*

**EER modeled Oregon as two zones, separated by the Cascade Mountains, Referred to as East Oregon and West Oregon, to represent the need for transmission across the mountains.*

Oregon Energy Strategy

Part 4: SEOs Key Findings

Top 15 Occupations by Demand in 2035 by Sector

West Oregon

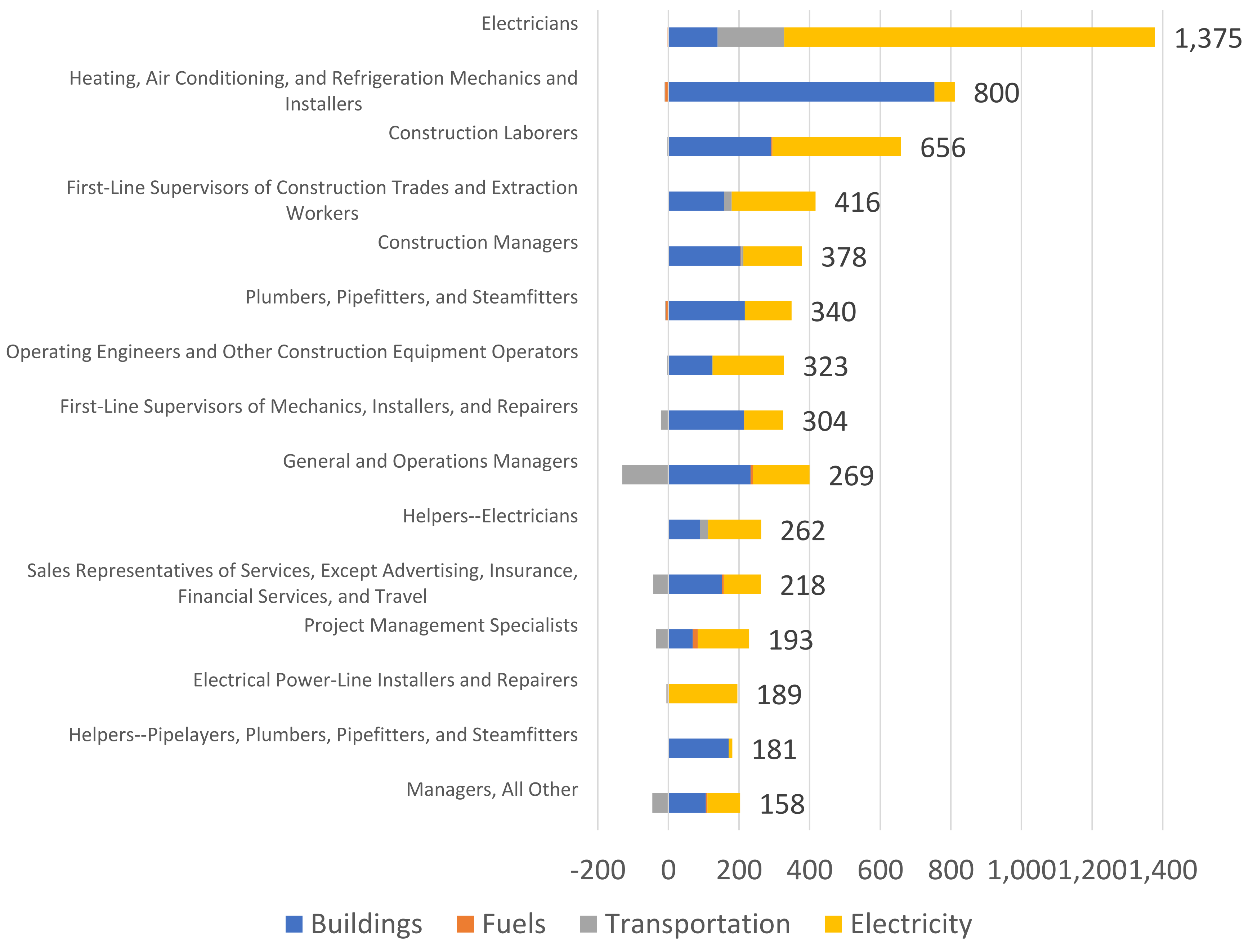
SOC Code	Occupation Title	Buildings Net New Jobs by 2035	Fuels Net New Jobs by 2035	Transportation Net New Jobs by 2035	Electricity Net New Jobs by 2035	Total New Jobs by 2035	Current Energy Sector Employment	Percent Growth Over Current Energy Sector Employment
47-2111	Electricians	139	-3	188	1,050	1,375	2,668	52%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	753	-9	-2	58	800	3,961	20%
47-2061	Construction Laborers	291	3	-3	365	656	2,447	27%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	158	-1	21	238	416	1,352	31%
11-9021	Construction Managers	205	2	6	166	378	1,621	23%
47-2152	Plumbers, Pipefitters, and Steamfitters	216	-8	-1	133	340	2,230	15%
47-2073	Operating Engineers and Other Construction Equipment Operators	125	-1	-3	203	323	1,140	28%
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	214	0	-21	110	304	1,983	15%
11-1021	General and Operations Managers	233	7	-131	160	269	3,593	7%
47-3013	Helpers--Electricians	89	0	24	150	262	107	245%
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	152	5	-43	105	218	1,622	13%
13-1082	Project Management Specialists	69	14	-35	145	193	1,342	14%
49-9051	Electrical Power-Line Installers and Repairers	0	-2	-4	195	189	844	22%
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	170	0	0	11	181	116	156%
11-9199	Managers, All Other	106	5	-45	93	158	1,401	11%

Oregon Energy Strategy

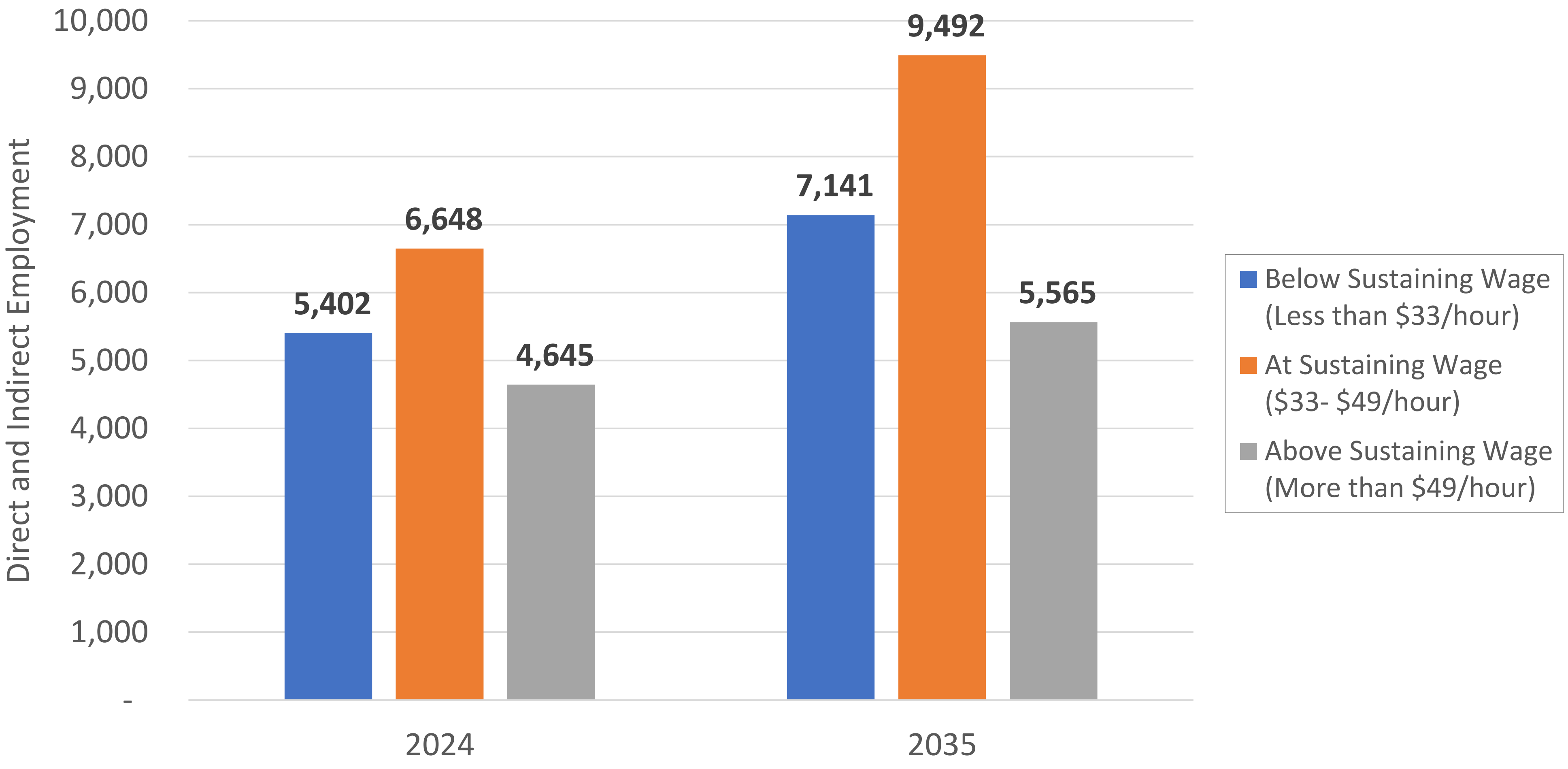
Part 4: SEOs Key Findings

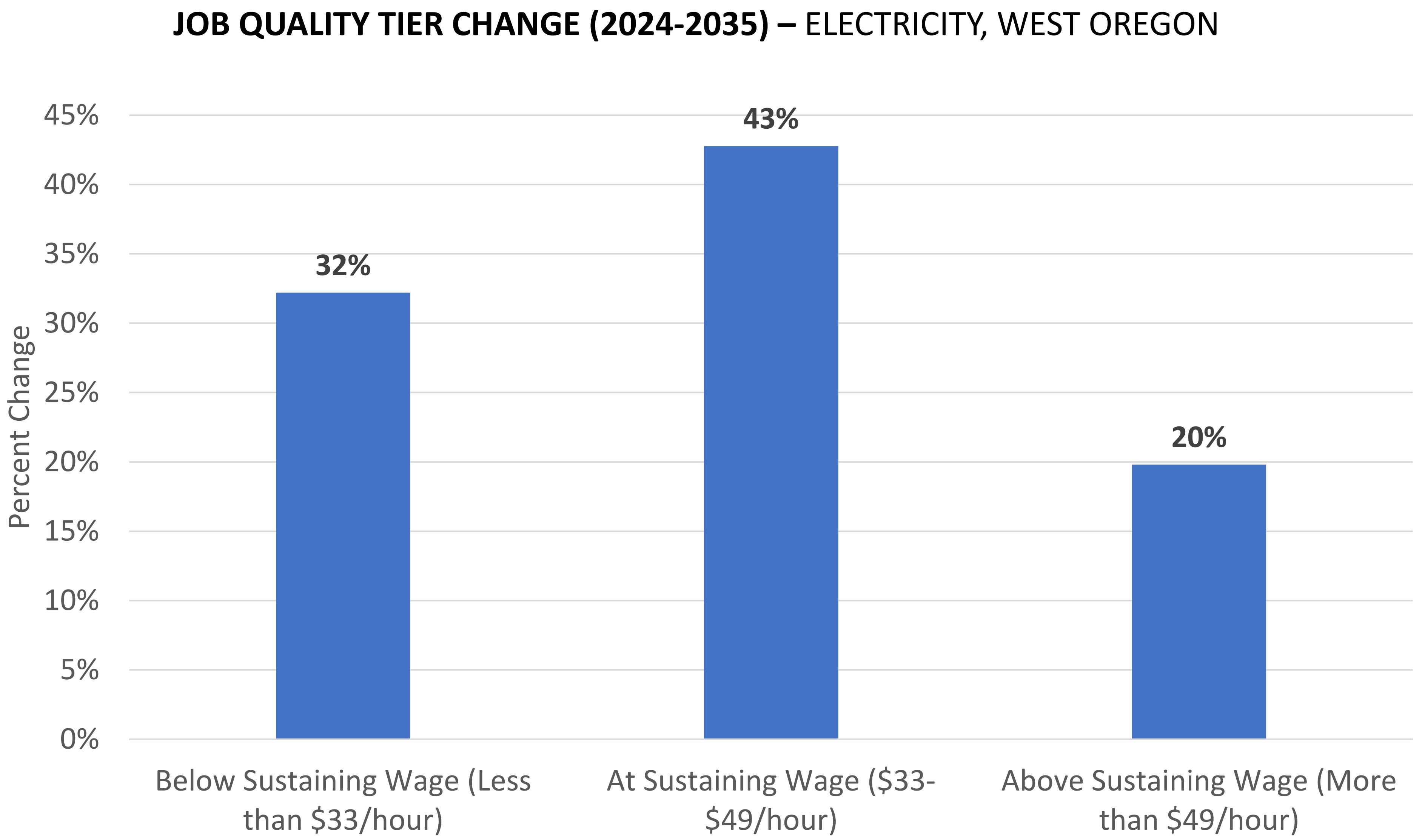
Top 15 Occupations by Demand in 2035 by Sector

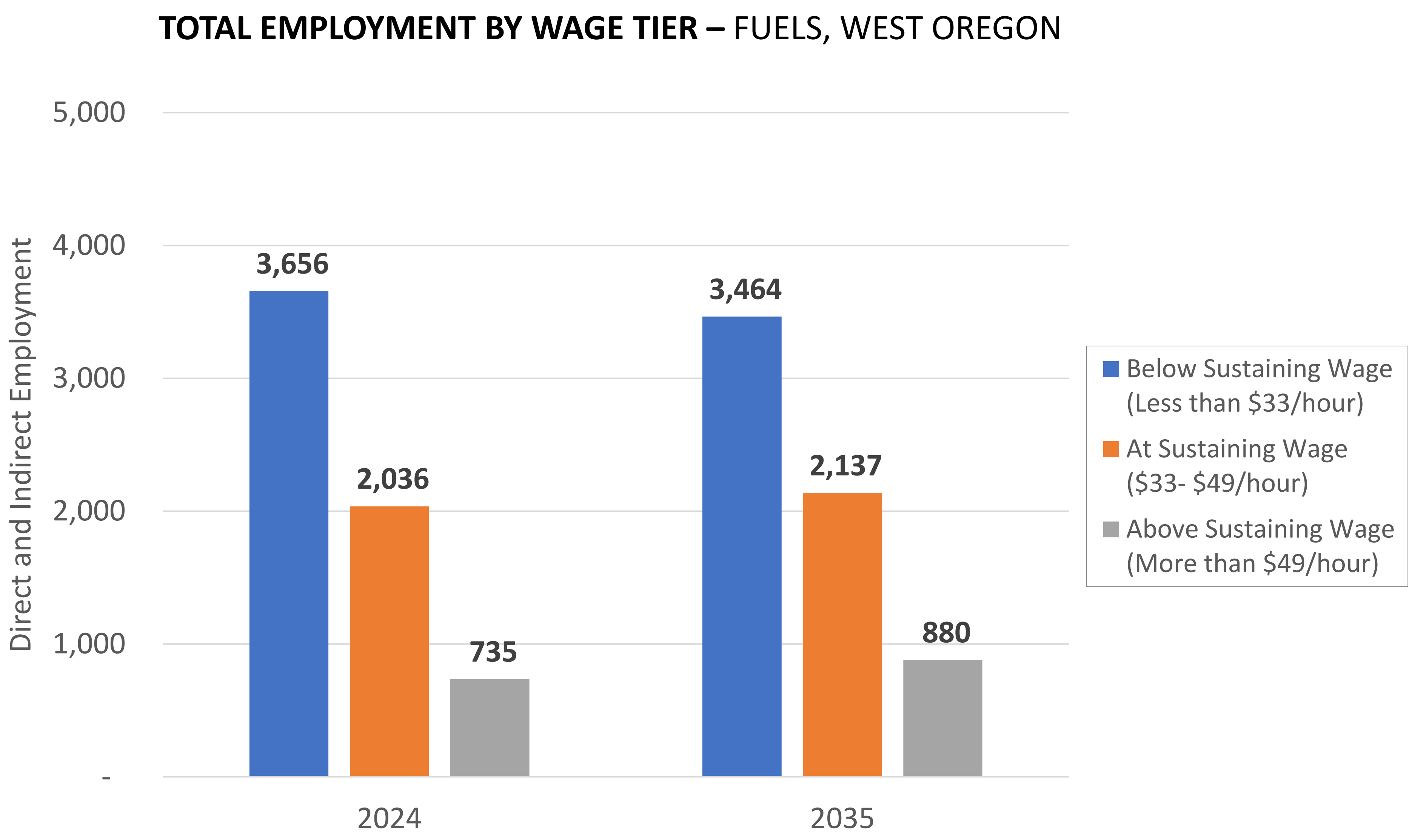
West Oregon



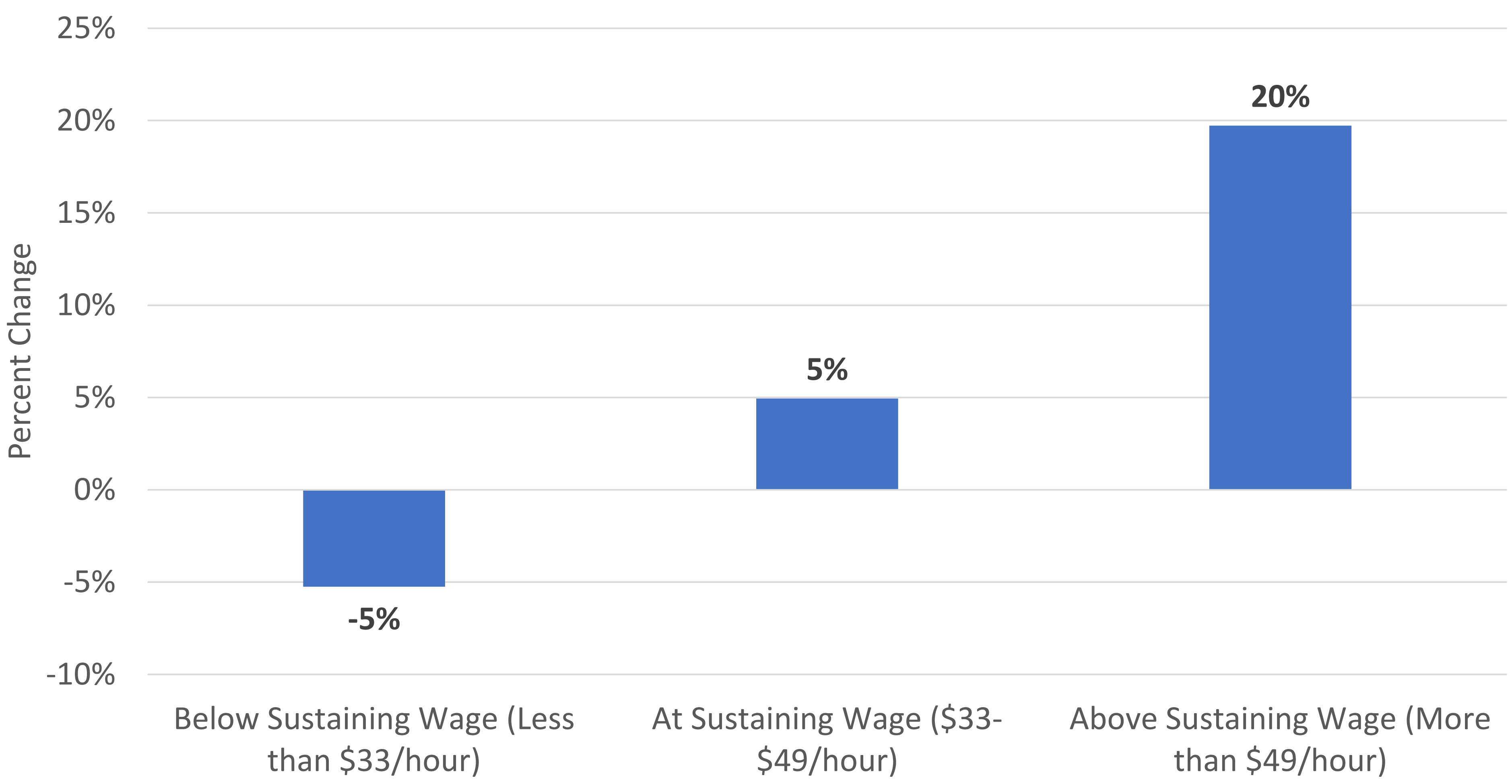
TOTAL EMPLOYMENT BY WAGE TIER – ELECTRICITY, WEST OREGON

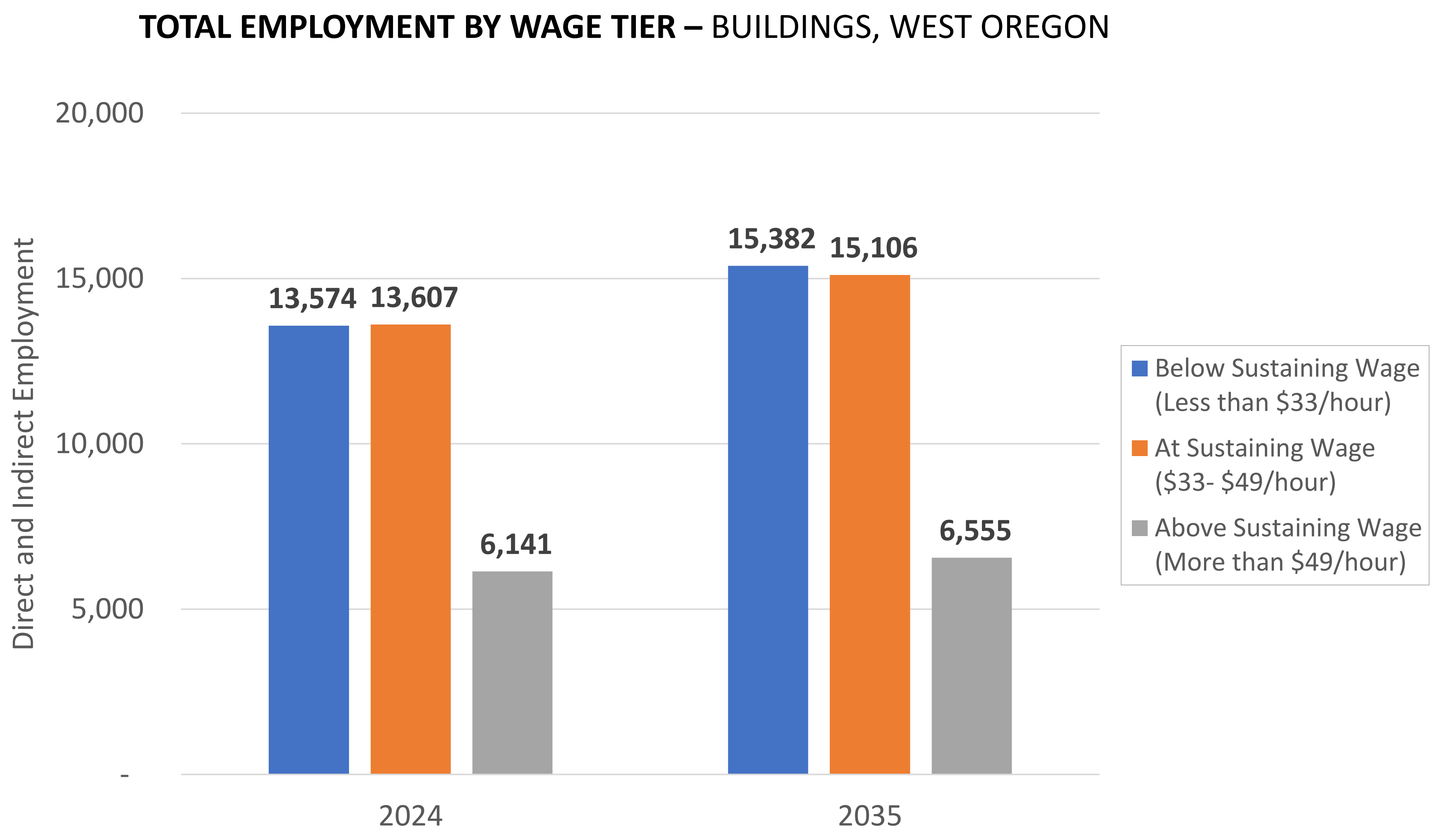



JOB QUALITY TIER CHANGE (2024-2035) – ELECTRICITY, WEST OREGON
Percent Change
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
32%
43%
20%
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33-$49/hour)
Above Sustaining Wage (More than $49/hour)

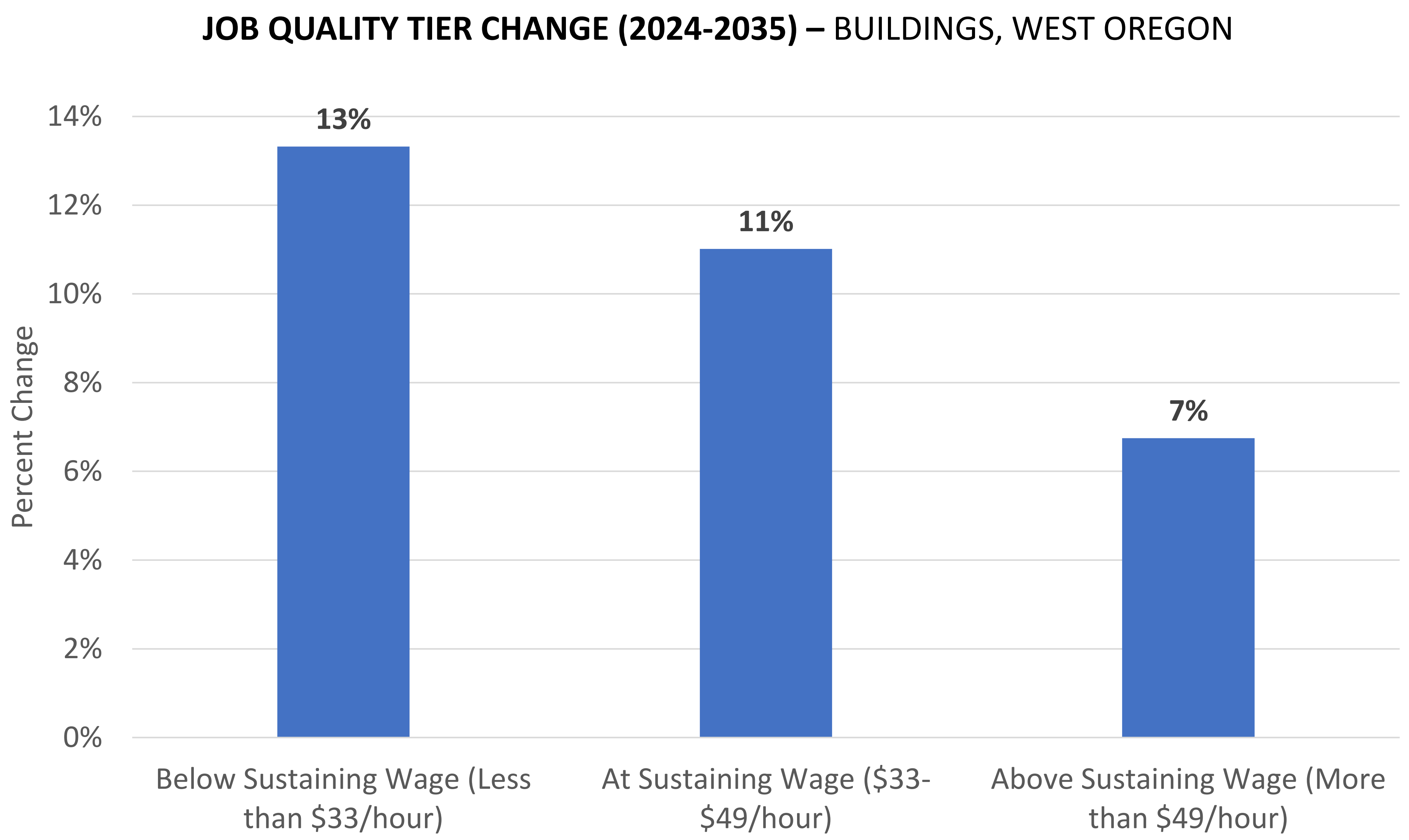

TOTAL EMPLOYMENT BY WAGE TIER – FUELS, WEST OREGON
Direct and Indirect Employment
5,000
4,000
3,000
2,000
1,000
-
3,656
2,036
735
3,464
2,137
880
2024
2035
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33- $49/hour)
Above Sustaining Wage (More than $49/hour)

JOB QUALITY TIER CHANGE (2024-2035) – FUELS, WEST OREGON

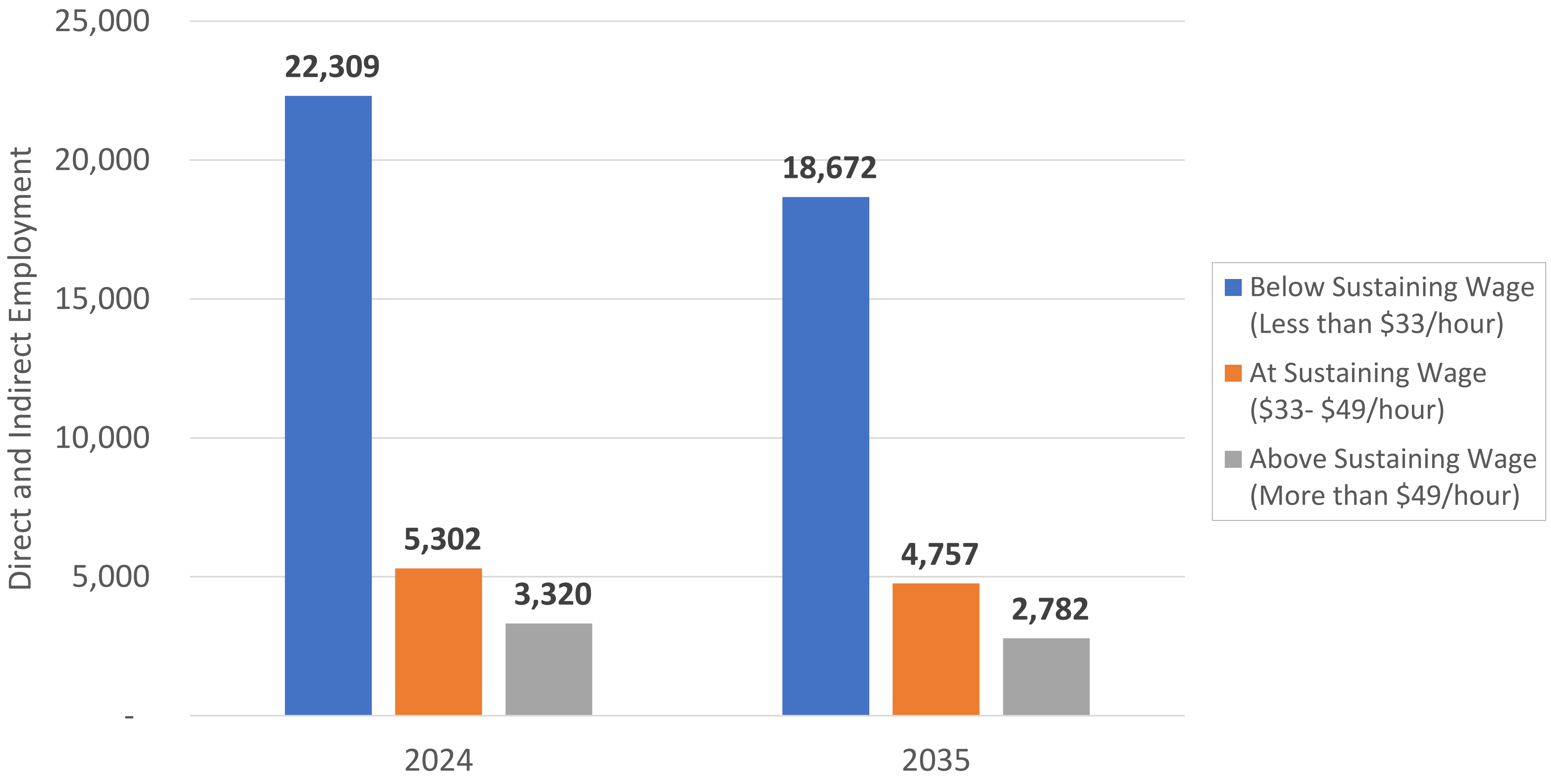


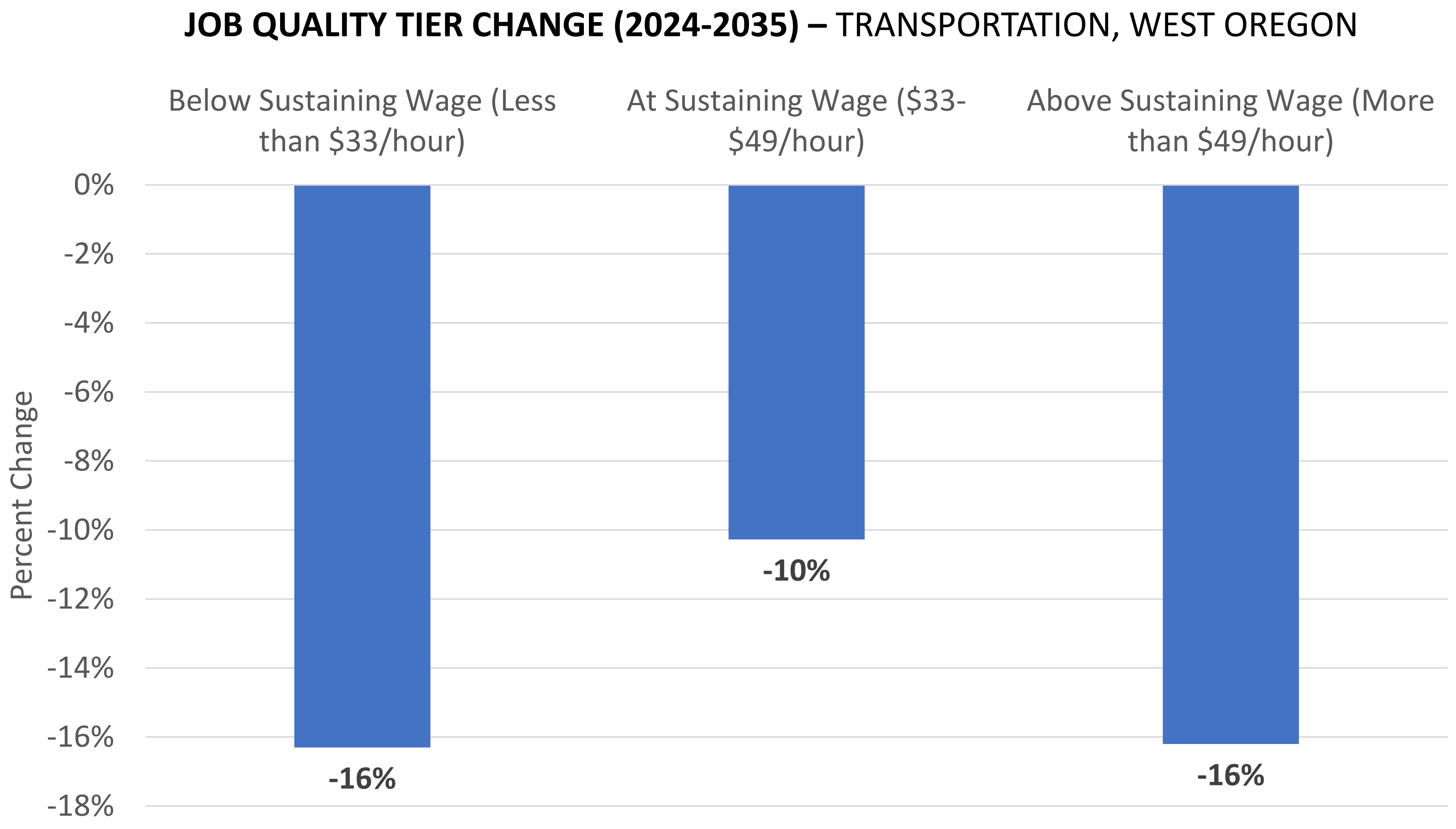


TOTAL EMPLOYMENT BY WAGE TIER – BUILDINGS, WEST OREGON
Direct and Indirect Employment
20,000
15,000
10,000
5,000
-
13,574
13,607
6,141
15,382
15,106
6,555
2024
2035
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33- $49/hour)
Above Sustaining Wage (More than $49/hour)


JOB QUALITY TIER CHANGE (2024-2035) – BUILDINGS, WEST OREGON
Percent Change
14%
12%
10%
8%
6%
4%
2%
0%
13%
11%
7%
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33-$49/hour)
Above Sustaining Wage (More than $49/hour)

TOTAL EMPLOYMENT BY WAGE TIER – TRANSPORTATION, WEST OREGON




JOB QUALITY TIER CHANGE (2024-2035) – TRANSPORTATION, WEST OREGON
Below Sustaining Wage (Less than $33/hour)
At Sustaining Wage ($33-$49/hour)
Above Sustaining Wage (More than $49/hour)
Percent Change
0%
-2%
-4%
-6%
-8%
-10%
-12%
-14%
-16%
-18%
-16%
-10%
-16%

Part 4.4

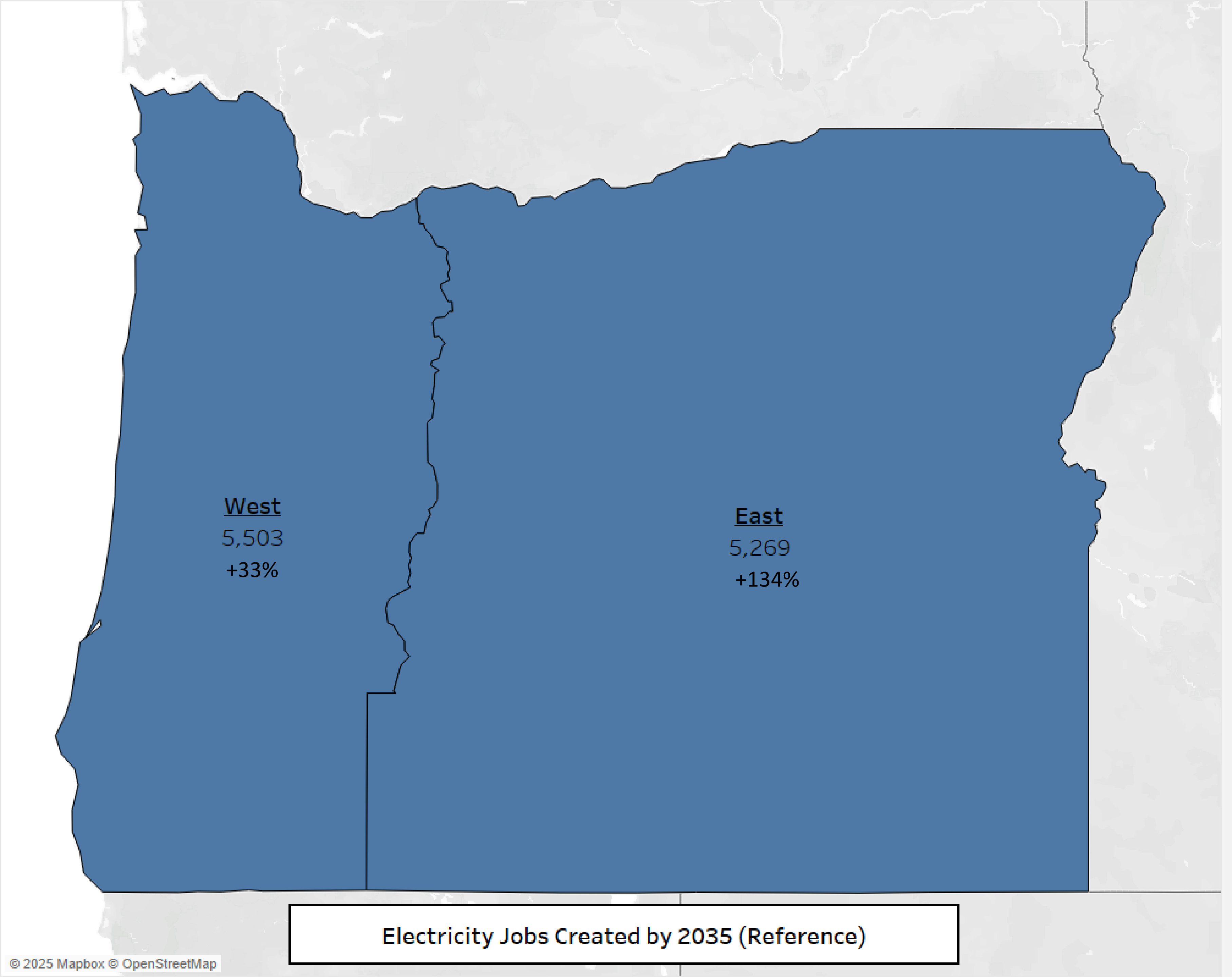
Reference Scenario Secondary Employment Outputs (SEOs) – Regional Comparisons

Oregon Energy Strategy

Part 5: Electricity Sector SEOs

Regional Comparison

Values shown are the net job changes from 2024 to 2035 for all direct and indirect employment within the Electricity sector.



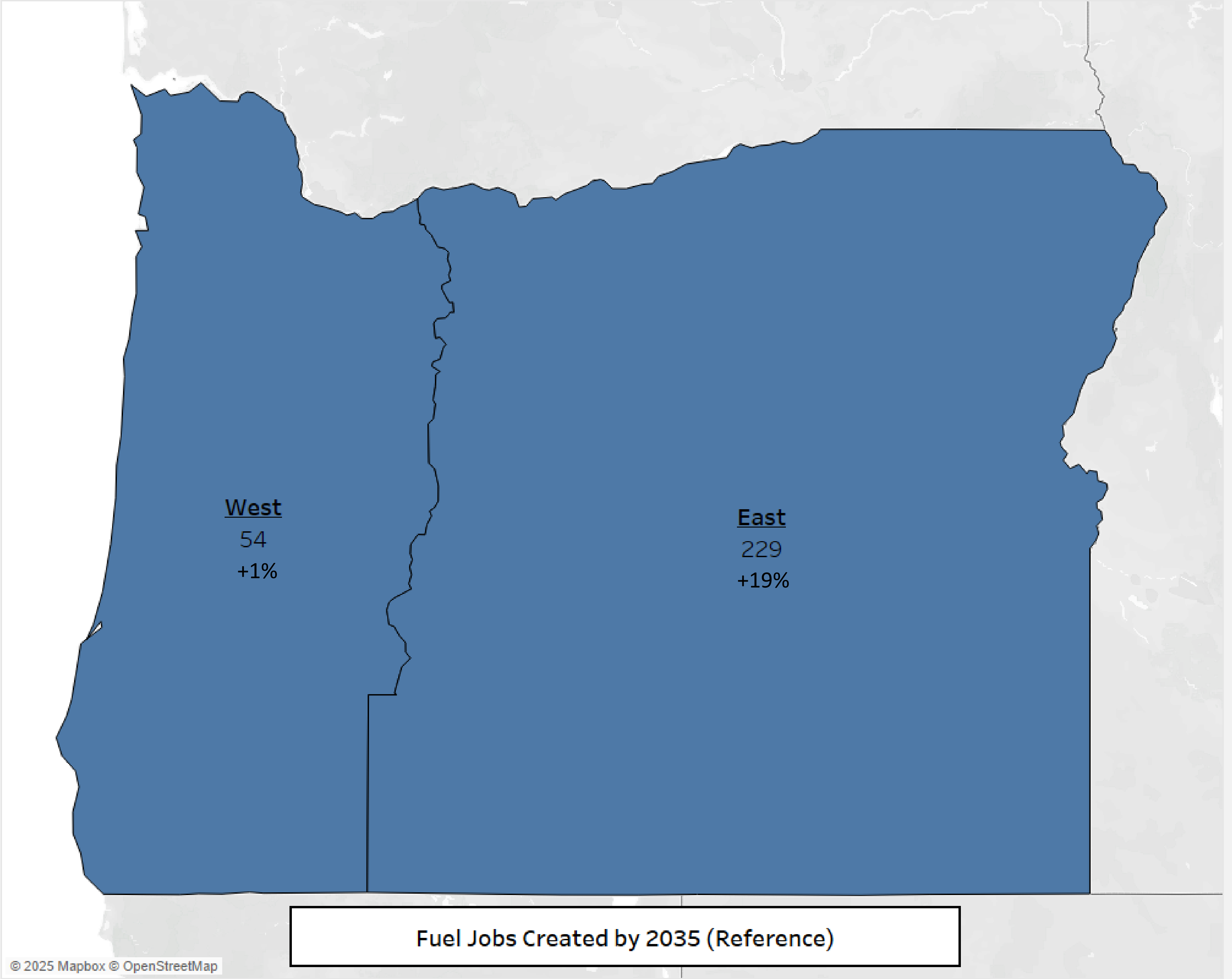
Electricity Jobs Created by 2035 (Reference)

Oregon Energy Strategy

Part 6: Fuels Sector SEOs

Regional Comparison

Values shown are the net job changes from 2024 to 2035 for all direct and indirect employment within the Fuels sector.



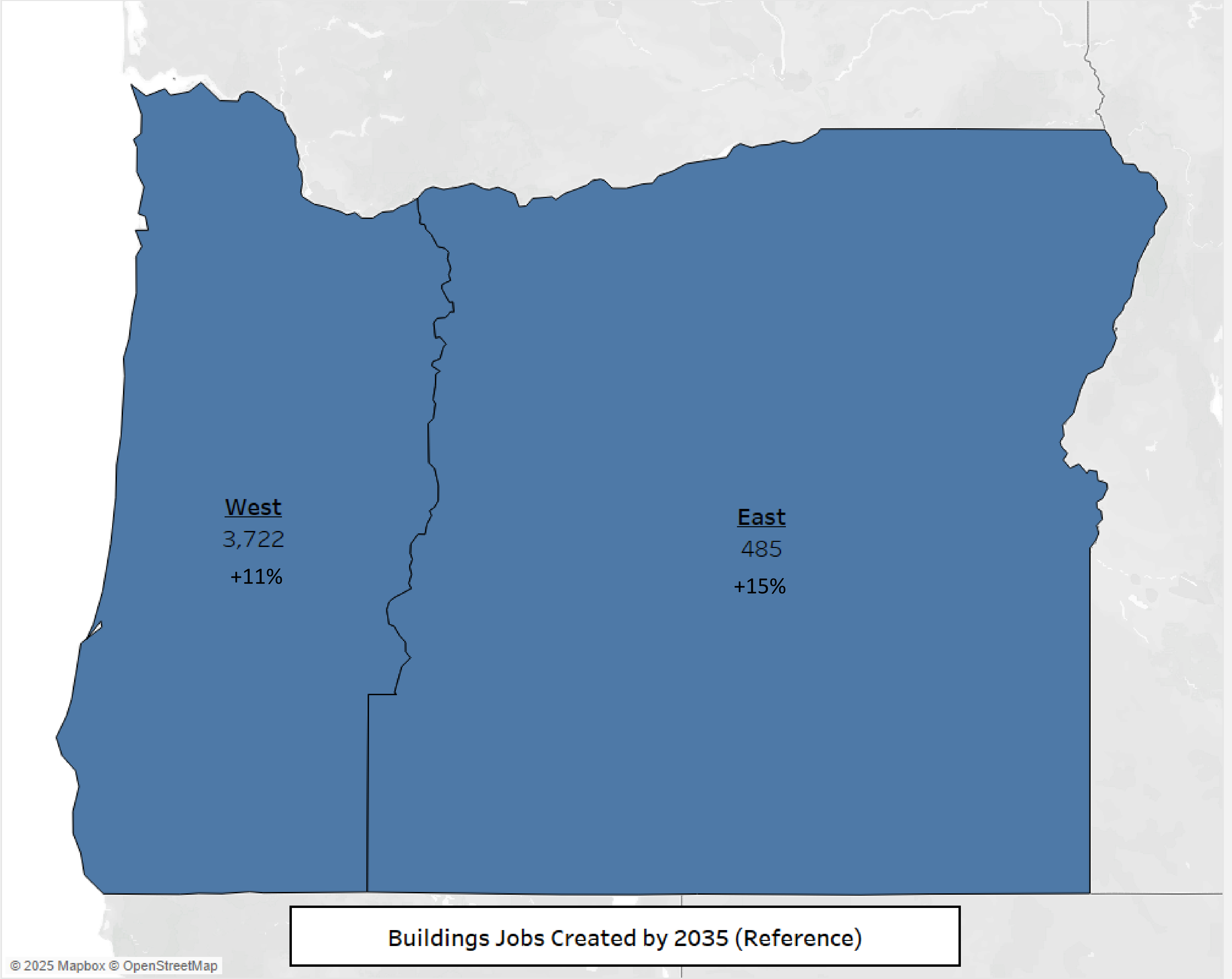
Fuel Jobs Created by 2035 (Reference)

Oregon Energy Strategy

Part 8: Buildings Sector SEOs

Regional Comparison

Values shown are the net job changes from 2024 to 2035 for all direct and indirect employment within the Buildings sector.

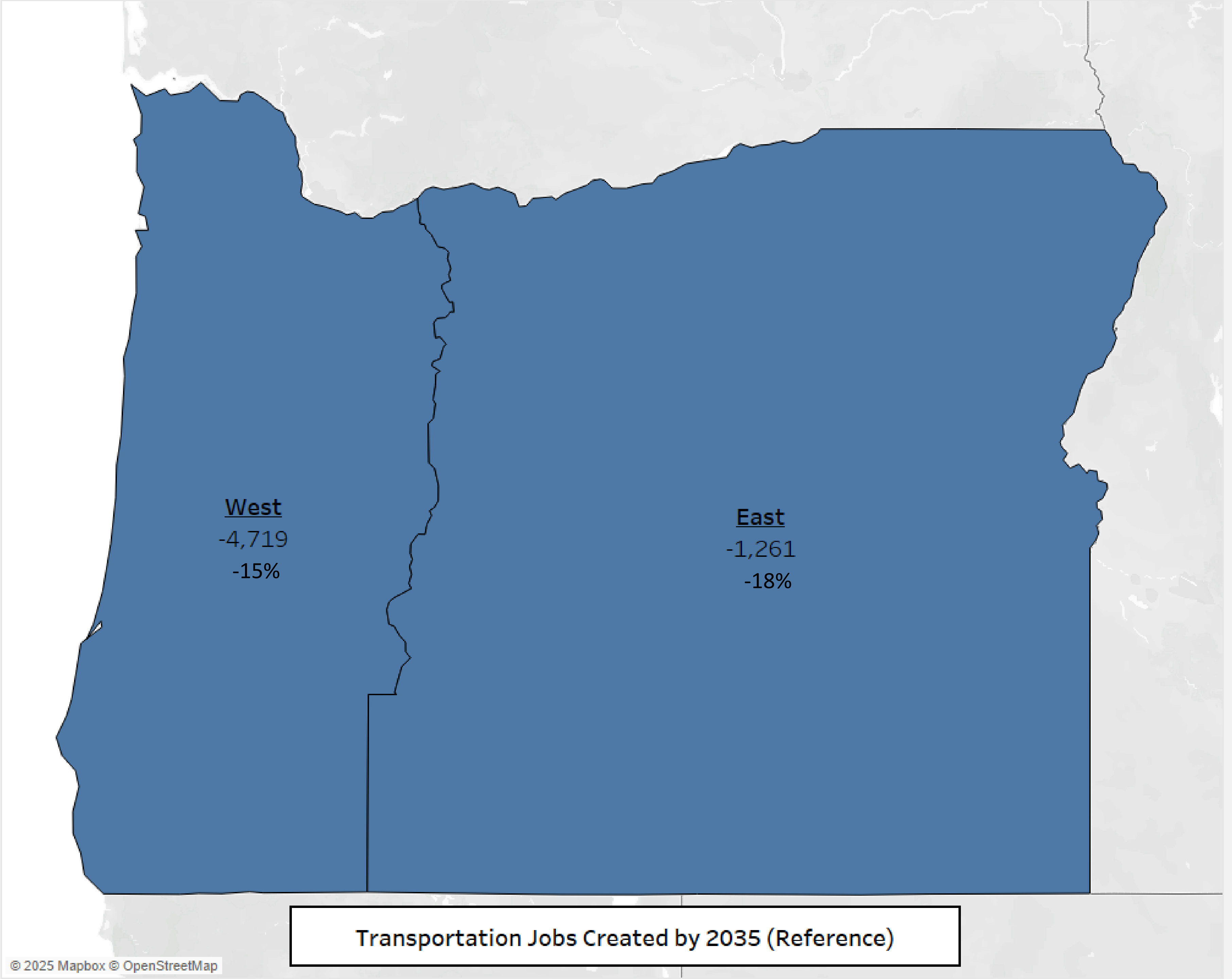


Oregon Energy Strategy

Part 7: Transportation Sector SEOs

Regional Comparison

Values shown are the net job changes from 2024 to 2035 for all direct and indirect employment within the Transportation sector.



Part 5

Alternative Scenarios

Overall Key Findings I: Scenarios and Sensitivities Analyzed

- In addition to the Reference Scenario, the jobs study modeled six (highlighted below) of the ten alternative scenarios and *sensitivities,* selected based on which ones were likely to provide the greatest learnings about jobs implications:
  - *0a. No Change in VMT (No VMT)*
  - *0b. 50% Lower Tech Load Growth (50% Tech Load)*
  - *0c. No Advanced Clean Trucks Regulation (No ACT)*
  - 1. Delayed Energy Efficiency and Building Electrification (Delayed BE & EE)
  - 2. Delayed Transportation Electrification (Delayed TE)
  - 3. Limited Demand Response (Ltd DR)
  - 4. Limited Utility-Scale Electricity Generation in Oregon (Ltd Gen)
  - 5. High Distributed Energy Resources + Limited Transmission (High DER + Ltd Tx)
  - *5a. No Change in VMT with High Distributed Energy Resources + Limited Transmission*
  - 6. Alternative Flexible Resources (Alt Flex Res)
- For the sake of clarity, both scenarios and sensitivities will be referred to as “scenarios” in the jobs analysis.

Overall Key Findings I: Scenarios and Sensitivities Analyzed

- **50% Tech Load**
  - Assumes half of Reference Scenario electricity demand from tech loads (data centers and chip fabrication), based on forecast from NW Power and Conservation Council
  - Even with only half of the modeled tech load electricity demand, Oregon's electricity demand could still increase by over 25% by 2030 and 35% by 2035
- **No ACT**
  - Assumes no interim electrification targets for medium- and heavy-duty vehicles through 2035, whereas ACT targets are assumed through 2035 in Reference Scenario and Delayed TE scenario
  - Still reaches 100% zero emission vehicle sales by 2050
  - Slower pace of transportation electrification leads to increased economy-wide costs
- **Delayed EE & BE**
  - Electrification sales shares for space and water heating in buildings delayed 10 years from Reference Scenario
  - Industrial process efficiency assumptions and fuel switching assumptions halved
  - Delaying energy efficiency and building electrification increases economy-wide costs

Overall Key Findings I: Scenarios and Sensitivities Analyzed

- **Ltd Gen**
  - Limits grid-scale wind, solar, and geothermal generation in Oregon to half of Reference Scenario
  - Leads to increased economy-wide costs and increased imported generation relative to Reference Scenario
- **High DER & Ltd Tx**
  - Higher levels of rooftop solar, demand response (vehicle-to-grid), and behind-the-meter storage; transmission limited to reconductoring
  - Rooftop solar can displace the need for some grid-scale energy
- **Alt Flex Res**
  - Does not allow construction of any new gas or biogas electricity generators (Reference Scenario allows 100% hydrogen- or new biogas-supplied electricity plants under 25 MW)
  - Leads to significantly more renewable build-out (mostly solar and geothermal), largely to create clean hydrogen from electrolysis, which can serve a flexibility role on the system

Overall Key Findings II: Difference from Reference by Sector

- **Buildings:** Only the Delayed EE & BE scenario differs from Reference scenario. No change from Reference in 50% Tech Load, No ACT, Ltd Gen, High DER + Ltd Tx, and Alt Flex Res scenarios.
- **Transportation:** Only the No ACT scenario differs from the Reference scenario. No change from Reference in 50% Tech Load, Delayed EE & BE, Ltd Gen, High DER + Ltd Tx, and Alt Flex Res scenarios.
- **Fuels:** Differs from the Reference scenario in all 6 alternative scenarios.
- **Electricity:** Differs from the Reference scenario in all 6 alternative scenarios.

Overall Key Findings III: Totals

50% Tech Load Scenario:

- Consistently fewer jobs throughout the modeling period compared to the Reference (3,600–6,900 fewer jobs, 2-4% difference from Reference)
- Drop is primarily driven by reductions in Electric sector employment

No ACT and Delayed EE & BE Scenarios:

- Slightly fewer total jobs by 2035 compared to the Reference (1% difference)
- Short-term losses relative to Reference shift to job gains by 2050, resulting in more total jobs than the Reference in the long run

Overall Key Findings IV: Totals

Ltd Gen Scenario:

- Slightly fewer total jobs by 2035 compared to the Reference (1% difference from Reference), gap widens by 2050 (5% difference from Reference)
- Electric sector employment drives short and long-term negative trends relative to the Reference as less in-state generating capacity is built

Alt Flex Res and High DER + Ltd Tx Scenarios:

- Consistently higher employment compared to the Reference throughout the modeling period – 1,600-3,600 more jobs (1-2% of total Reference scenario employment)
- High DER + Ltd Tx scenario sees greater employment impacts in 2035 (3,600 jobs more than Reference) than 2050 (2,700 more jobs), while the Alt Flex Res scenario sees greater employment impacts in 2050 (3,600 more jobs than Reference) than 2035 (1,600 more jobs)
- In 2050, Electric sector employment drives higher job count (90% of total jobs difference from Reference scenario)

Overall Key Findings V: Total and Percent Difference Relative to Reference Scenario

Year	Scenario	Electricity	Buildings	Fuels	Transportation	Total
2035	50% Tech Load	-3,573 (-8%)	0	-59 (-1%)	0	-3,632 (-2%)
	No ACT	-1,175 (-3%)	0	-810 (-7%)	789 (+2%)	-1,195 (-1%)
	Delayed EE & BE	-435 (-1%)	-1,020 (-2%)	235 (+2%)	0	-1,220 (-1%)
	Ltd Gen	-1,339 (-3%)	0	-244 (-2%)	0	-1,584 (-1%)
	High DER + Ltd Tx	3,890 (+9%)	0	-267 (-2%)	0	3,623 (+2%)
	Alt Flex Res	837 (+2%)	0	783 (+7%)	0	1,620 (+1%)
2050	50% Tech Load	-6,899 (-12%)	0	-25 (-0.2%)	0	-6,925 (-4%)
	No ACT	2,572 (+4%)	0	-1,340 (-9%)	995 (+3%)	2,227 (+1%)
	Delayed EE & BE	1,603(+3%)	-432 (-1%)	-199 (-1%)	0	972 (+1%)
	Ltd Gen	-7,294 (-13%)	0	-14 (-0.1%)	0	-7,309 (-5%)
	High DER + Ltd Tx	2,801 (+5%)	0	-59 (-0.4%)	0	2,742 (+2%)
	Alt Flex Res	3,226 (+6%)	0	356 (+2%)	0	3,582 (+2%)

COMPARISONS TO REFERENCE SCENARIO, 2035

	Electricity	Buildings	Fuels	Transportation	Total
50% Tech Load	-3,573	0	-59	0	-3,632
No ACT	-1,175	0	-810	789	-1,195
Delayed EE & BE	-435	-1,020	235	0	-1,220
Ltd Gen	-1,339	0	-244	0	-1,584
High DER + Ltd Tx	3,890	0	-267	0	3,623
Alt Flex Res	837	0	783	0	1,620

COMPARISONS TO REFERENCE SCENARIO, 2050

	Electricity	Buildings	Fuels	Transportation	Total
50% Tech Load	-6,900	0	-25	0	-6,925
No ACT	2,572	0	-1,340	995	2,227
Delayed EE & BE	1,603	-432	-199	0	972
Ltd Gen	-7,294	0	-14	0	-7,309
High DER + Ltd Tx	2,801	0	-59	0	2,742
Alt Flex Res	3,226	0	356	0	3,582

Key Findings by Sector I: Buildings Sector Output Totals

- The Delayed EE and BE scenario results in fewer jobs than the Reference in both the short and long term, primarily due to reductions in Commercial and Residential HVAC activity

- Short-term impact (2035) more significant than long-term impact (2050)

  - 1,000 fewer jobs than the Reference in 2035 (2% difference) and 400 fewer jobs than the Reference in 2050 (1% difference)

Key Findings by Sector II: Transportation Sector Output Totals

- The No ACT scenario leads to fewer job losses than the Reference by 2035 and 2050
  - 800 more jobs than Reference in 2035 (+2%), and 1,000 more jobs in 2050 (+3%)
  - Fewer job losses in fueling stations and vehicle maintenance compared to the Reference, reflecting shifts in the vehicle technology mix

Key Findings by Sector III: Electricity Sector Output Totals

- The Alt Flex Res scenario results in increased electricity jobs relative to the Reference scenario, driven by increases in Utility solar (1,400 jobs by 2050, +28%) and Geothermal (1,400 jobs by 2050, +30%)

- The 50% Tech Load and Ltd Gen scenarios have the largest negative job impact in the Electricity sector compared to the Reference scenario driven by fewer jobs in Utility Solar (200 and 2,100 fewer jobs by 2050, -4% and -43%, respectively), Geothermal (4,200 and 2,300 fewer jobs by 2050, -86% and -48%, respectively), and Land-based wind (1,500 and 2,900 fewer jobs by 2050, -16% and -30%, respectively)

- By 2035, four of the six alternative scenarios result in fewer Electricity sector jobs than the Reference scenario. The Alt Flex Res and High DER + Ltd Tx scenarios result in more Electric sector jobs (800 and 3,900 more jobs than the Reference scenario, +2% and +7%, respectively)

- By 2050, the 50% Tech Load and Ltd Gen scenarios result in fewer Electricity sector jobs than the Reference (6,900 and 7,300 fewer jobs, -12% and -13%, respectively), while the No ACT, Delayed EE & BE, High DER + Ltd Tx, and Alt Flex Res scenarios result in more Electricity sector employment (1,600-3,200 more jobs, +3-6%)

Key Findings by Sector IV: Fuels Sector Output Totals

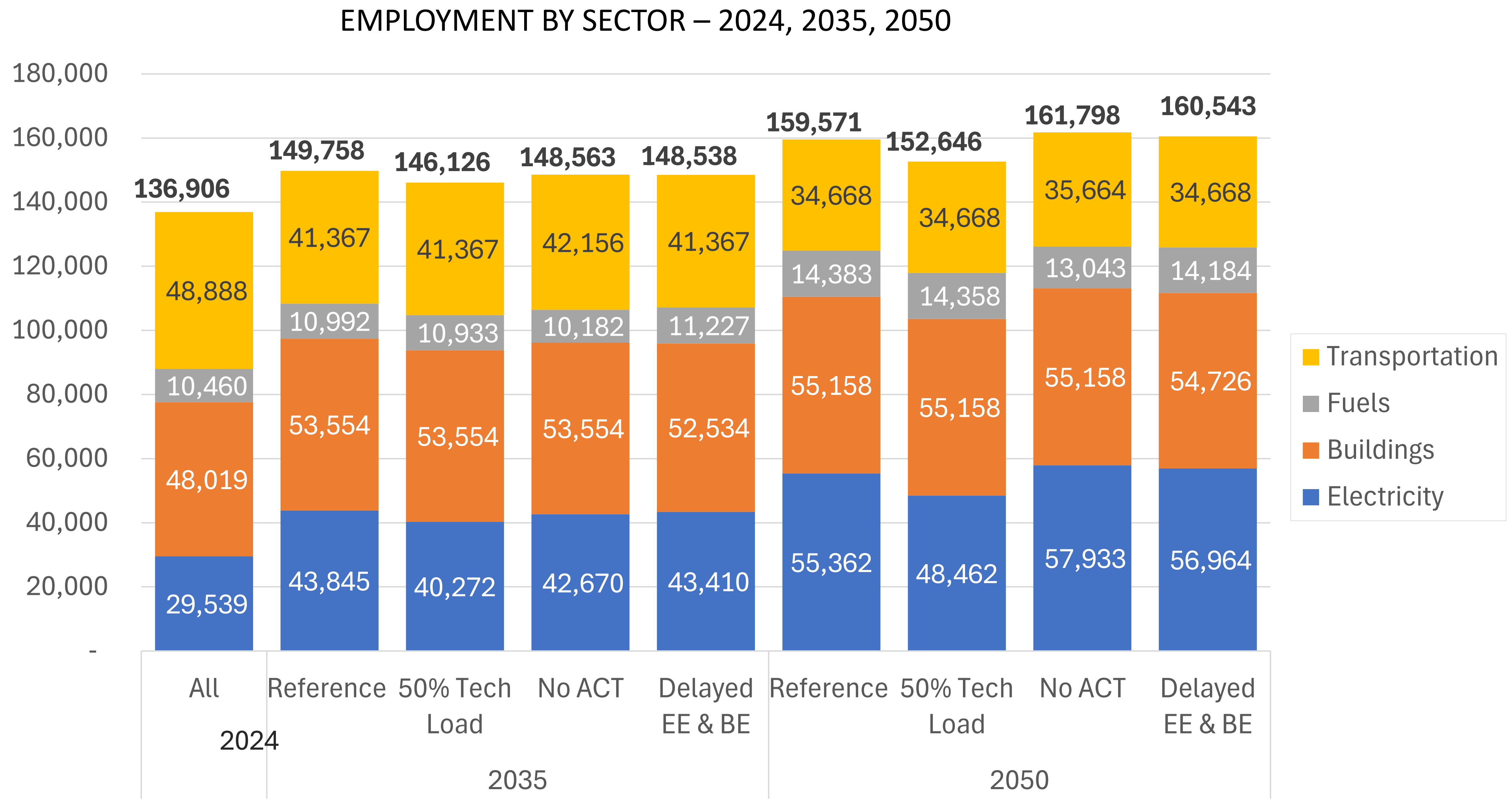
- Hydrogen fuels experience the largest nominal changes in job outputs across scenarios – 1,400 fewer jobs from the Reference scenario by 2050 (-26%) in the No ACT scenario and 800 more jobs than Reference by 2035 (+57%) in the Alt Flex Res scenario – while Other Fossil Fuels experience the largest percentage change from the Reference scenario, with more than double the jobs displaced by 2035 in the Ltd Gen scenario than under the Reference

- The Alt Flex Res scenario results in more jobs than the Reference scenario in both 2035 and 2050 – 800 more jobs than Reference in 2035 (+7%) and 350 more jobs in 2050 (+2%) – driven entirely by Hydrogen Fuels

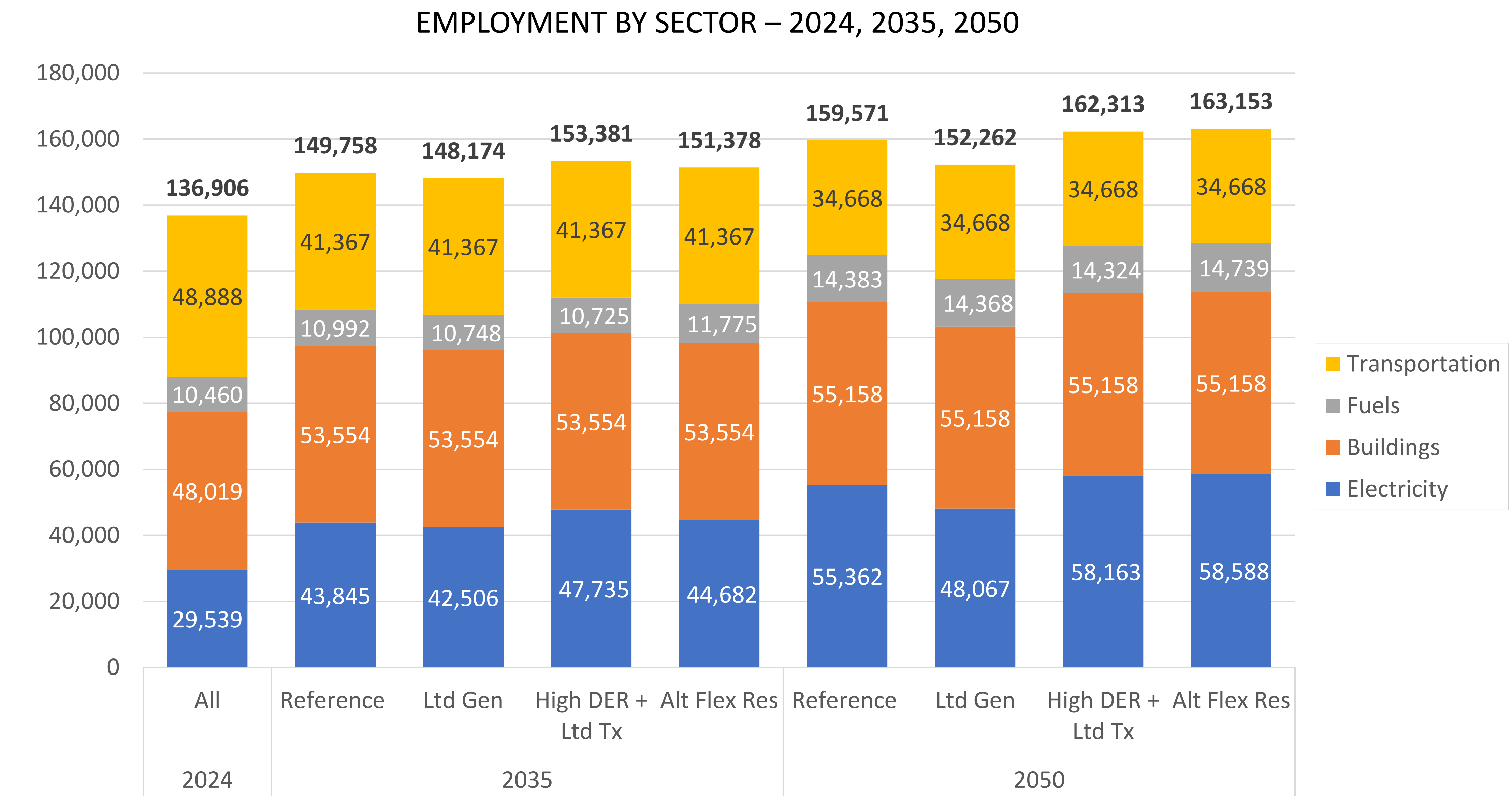
- The Delayed EE & BE scenario results in more jobs than the Reference scenario in 2035, but fewer in 2050 – early offsets driven by fewer Natural Gas Distribution job losses in the Delayed EE & BE scenario than in Reference

- The 50% Tech Load, No ACT, Ltd Gen, and High DER + Ltd Tx scenarios result in fewer jobs in both 2035 and 2050 compared to the Reference

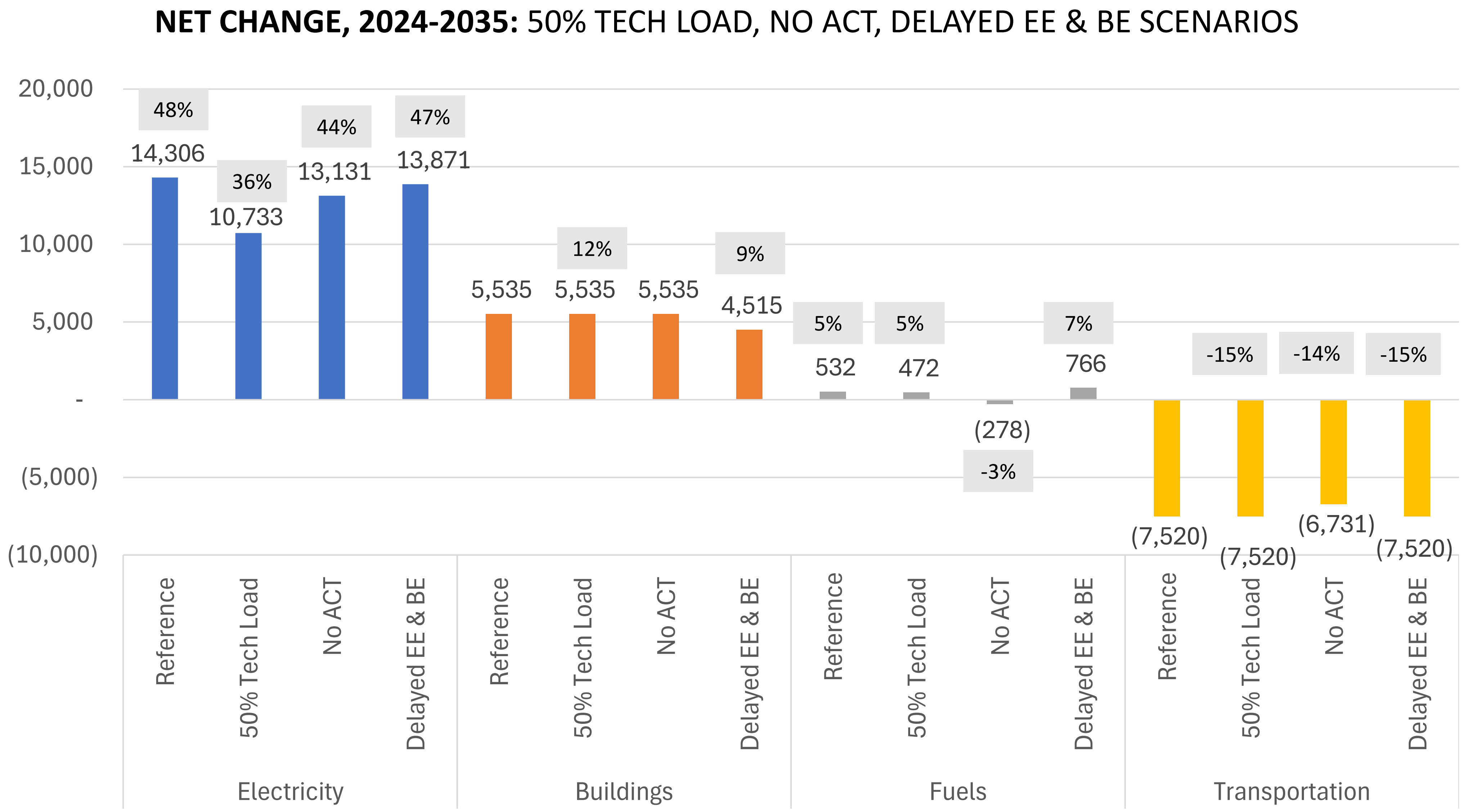
Alternative Scenario: Comparisons to Reference Scenario



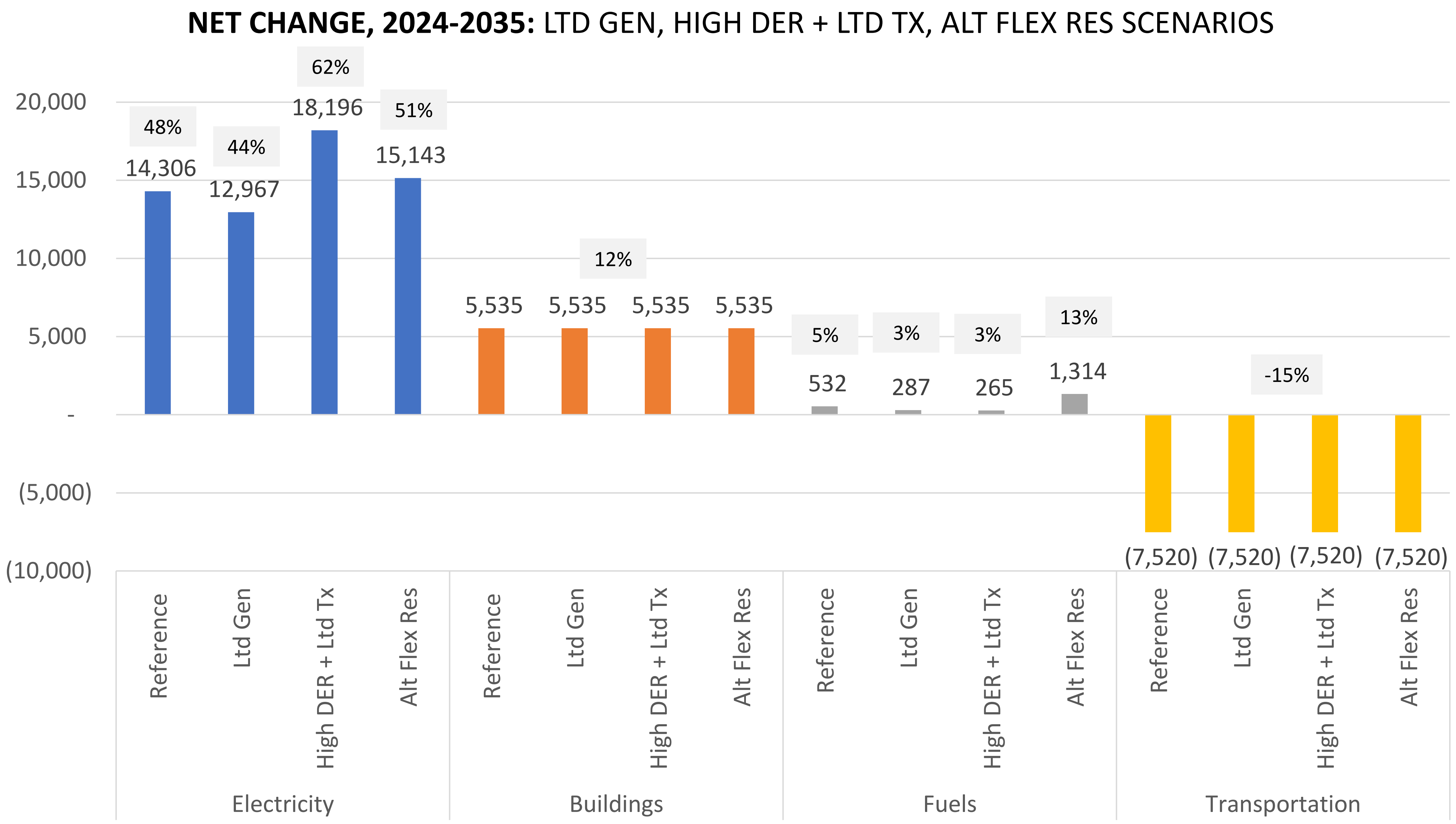
Alternative Scenario: Comparisons to Reference Scenario



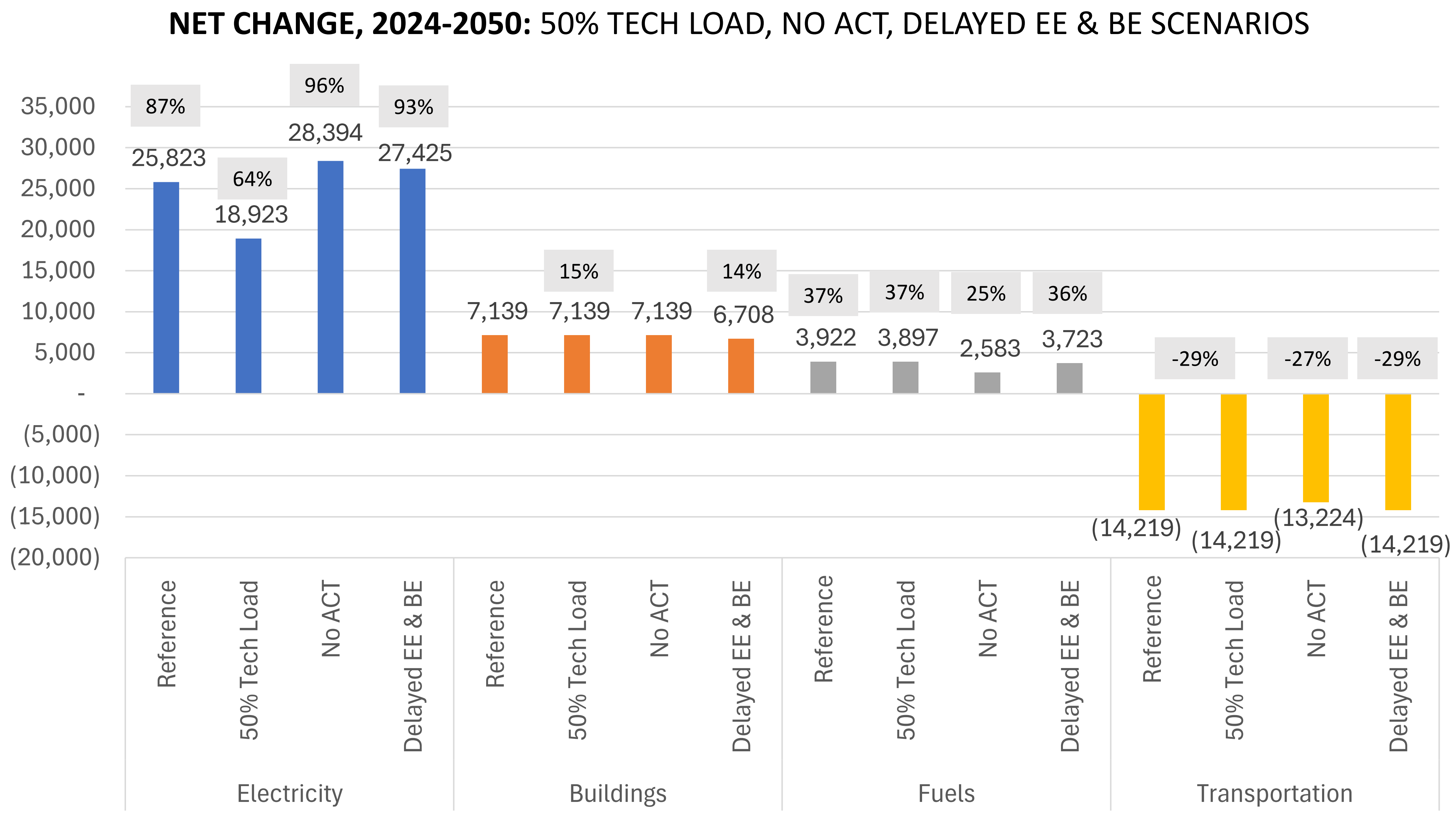
Alternative Scenario: Comparisons to Reference Scenario



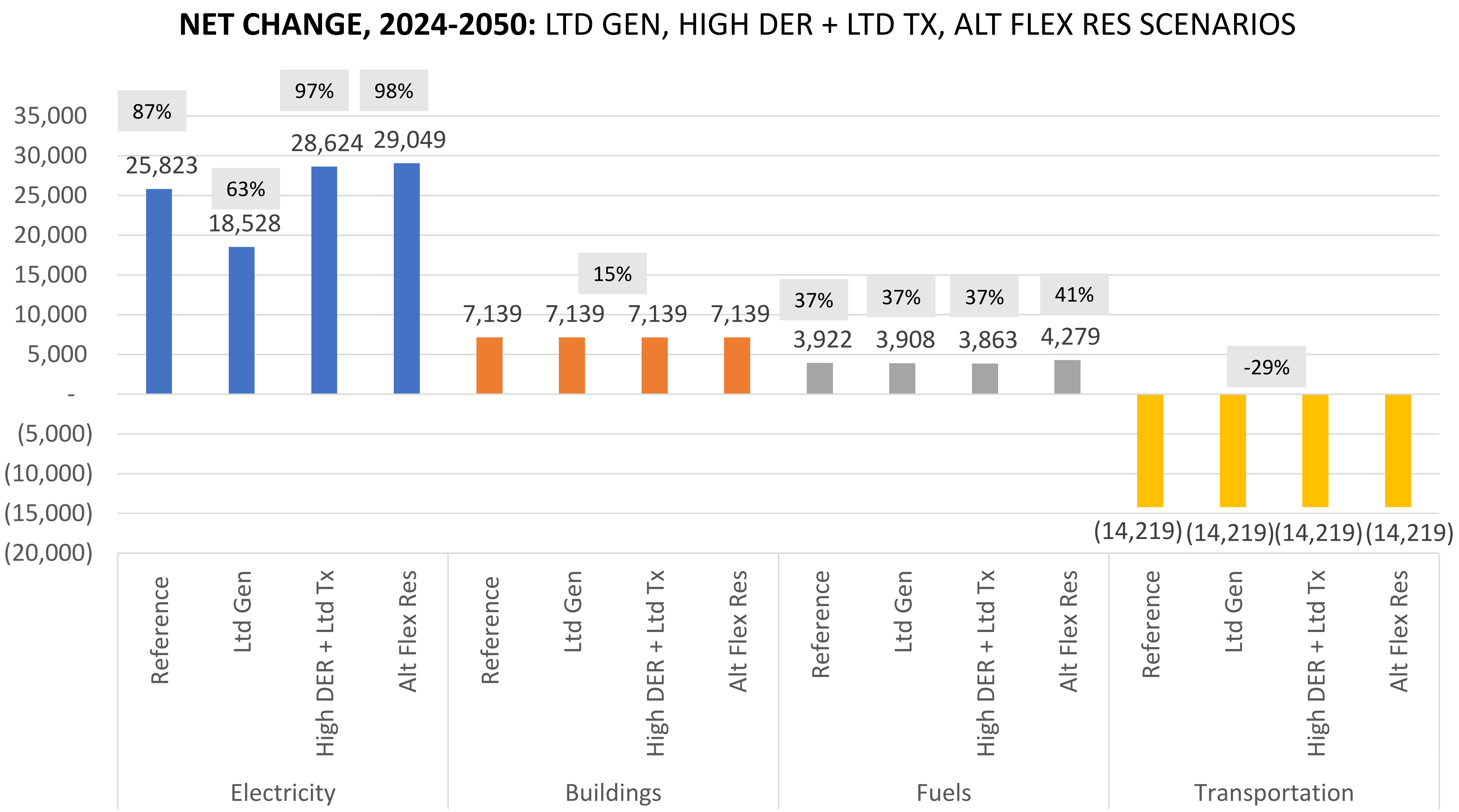
Alternative Scenario: Comparisons to Reference Scenario



Alternative Scenario: Comparisons to Reference Scenario



Alternative Scenario: Comparisons to Reference Scenario



Highest Impact Sub-Sectors

Sub-sectors were selected based on the magnitude of impact in their respective sectors and are meant to be illustrative of the primary trends within each sector.

Alternative Scenario: Highest Impact Sub-Sectors

EXAMPLE TABLE: COMPARING 50% TECH LOAD, NO ACT, AND DELAYED EE & BE SCENARIO OUTPUTS

Sector	Sub-Sector	2024	2035				2050			
		All	Ref.	50% Tech Load	No ACT	Delayed EE & BE	Ref.	50% Tech Load	No ACT	Delayed EE & BE
Buildings	**Commercial HVAC**	11,230	13,145	13,145	13,145	12,270	13,149	13,149	13,149	13,177
Electricity	**Transmission[1]**	2,220	5,427	4,917	5,315	5,348	7,391	6,563	7,059	7,165
Electricity	**Utility Solar**	1,288	2,872	1,833	2,357	2,598	4,802	4,620	5,162	4,839
Electricity	**Land-based Wind**	2,188	5,380	4,889	5,412	5,407	9,643	8,108	10,479	10,299
Electricity	**Geothermal**	160	1,814	499	1,490	1,798	4,853	668	6,761	6,075
Transportation	**Fueling Stations**	17,003	10,933	10,933	11,566	10,933	5,876	5,876	6,603	5,876
Fuels	**Hydrogen Fuels**	-	1,375	1,367	504	1,357	5,419	5,417	4,032	4,920

[1]Though not reported here, Electric Distribution follows similar trends to the Electric Transmission figures detailed here.

Alternative Scenario: Highest Impact Sub-Sectors

EXAMPLE TABLE: COMPARING LTD GEN, HIGH DER + LTD TX, AND ALT FLEX RES SCENARIO OUTPUTS

Sector	Sub-Sector	2024	2035				2050			
		All	Ref.	Ltd Gen	High DER + Ltd Tx	Alt Flex Res	Ref.	Ltd Gen	High DER + Ltd Tx	Alt Flex Res
Buildings	**Commercial HVAC**	11,230	13,145	13,145	13,145	13,145	13,149	13,149	13,149	13,149
Electricity	**Transmission[1]**	2,220	5,427	5,411	5,358	5,709	7,391	7,415	7,314	7,551
Electricity	**Utility Solar**	1,288	2,872	3,128	2,188	4,939	4,802	2,739	3,946	6,154
Electricity	**Land-based Wind**	2,188	5,380	4,577	5,294	5,233	9,643	6,773	9,487	10,416
Electricity	**Geothermal**	160	1,814	1,069	1,770	1,977	4,853	2,535	5,295	6,297
Transportation	**Fueling Stations**	17,003	10,933	10,933	10,933	10,933	5,876	5,876	5,876	5,876
Fuels	**Hydrogen Fuels**	-	1,375	1,413	1,401	2,157	5,419	5,468	5,429	5,742

[1]Though not reported here, Electric Distribution follows similar trends to the Electric Transmission figures detailed here.

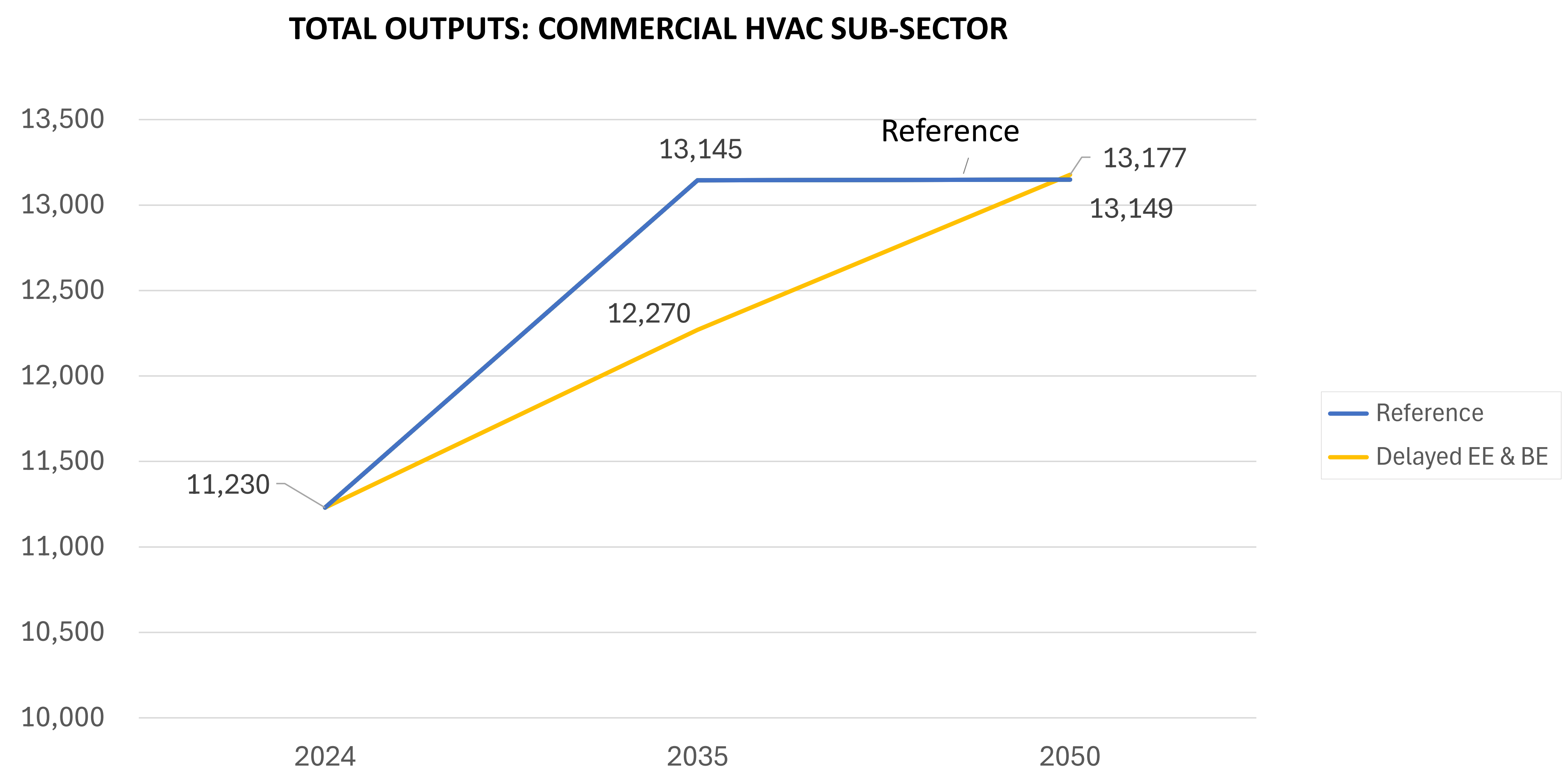
COMPARISONS TO REFERENCE SCENARIO BY SUBSECTOR, 2035

	Commercial HVAC	Transmission	Utility Solar	Land-based Wind	Geothermal	Fueling Stations	Hydrogen Fuels
50% Tech Load	0	−510	−1,039	−491	−1,315	0	−8
No ACT	0	−112	−515	32	−324	633	−871
Delayed EE & BE	−875	−79	−274	27	−16	0	−18
Ltd Gen	0	−16	256	−803	−745	0	38
High DER + Ltd Tx	0	−69	−684	−86	−44	0	26
Alt Flex Res	0	282	2,067	−147	163	0	782

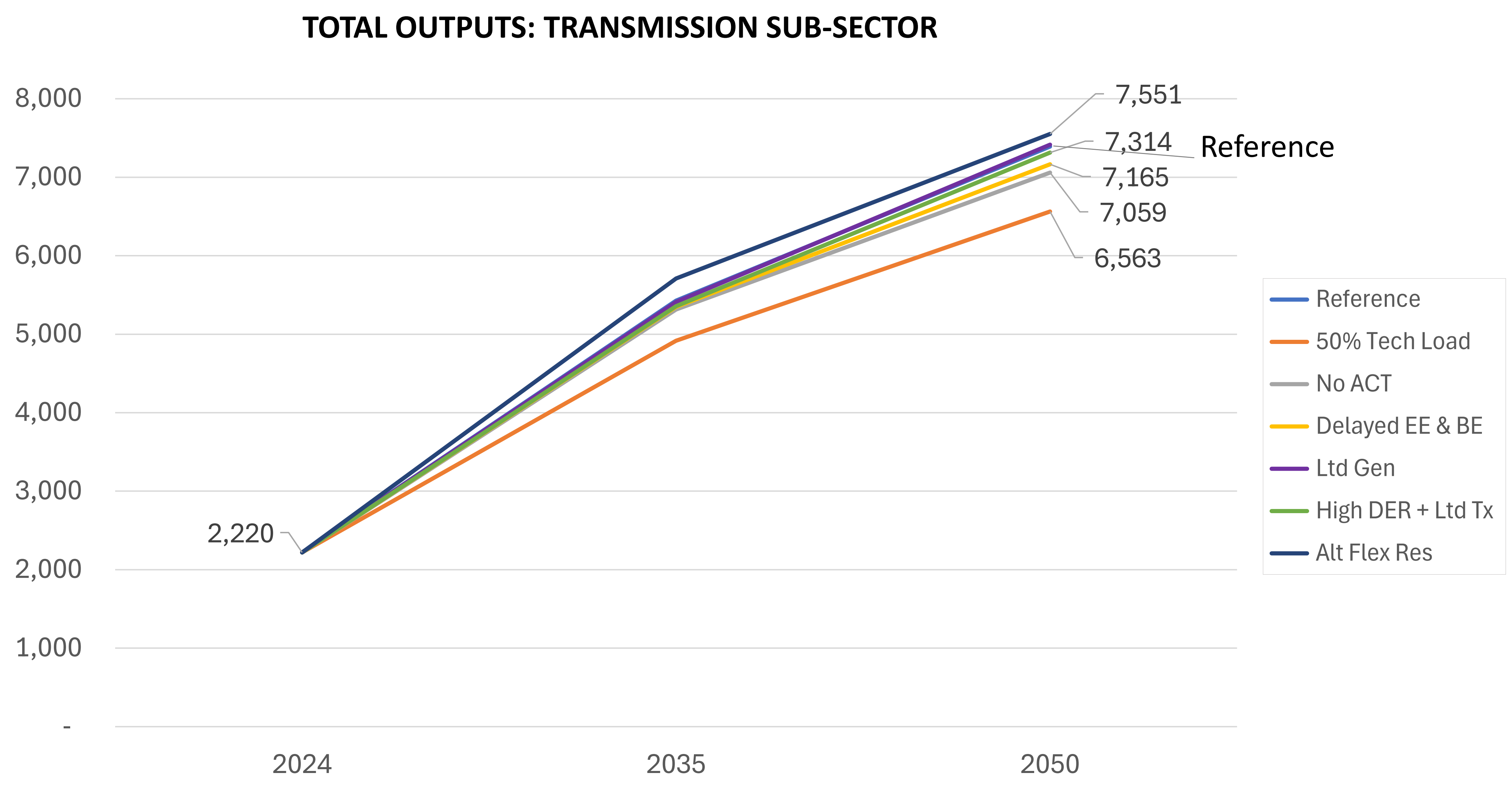
COMPARISONS TO REFERENCE SCENARIO BY SUBSECTOR, 2050

	Commercial HVAC	Transmission	Utility Solar	Land-based Wind	Geothermal	Fueling Stations	Hydrogen Fuels
50% Tech Load	0	-828	-182	-1,535	-4,185	0	-2
No ACT	0	-332	360	836	1,908	727	-1,387
Delayed EE & BE	28	-226	37	656	1,222	0	-499
Ltd Gen	0	24	-2,063	-2,870	-2,318	0	49
High DER + Ltd Tx	0	-77	-856	-156	442	0	10
Alt Flex Res	0	160	1,352	773	1,444	0	323

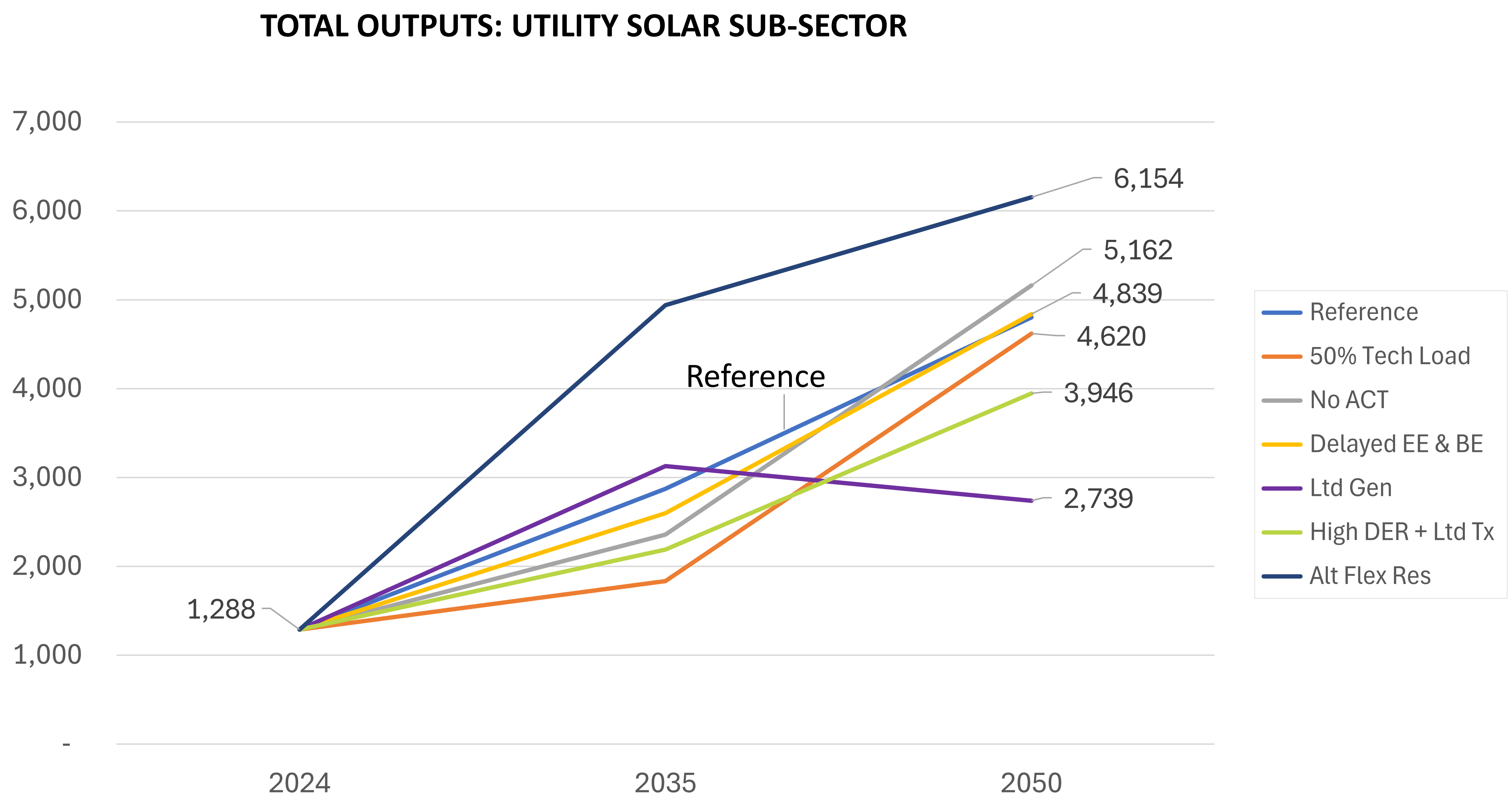
Alternative Scenario: Highest Impact Sub-Sectors



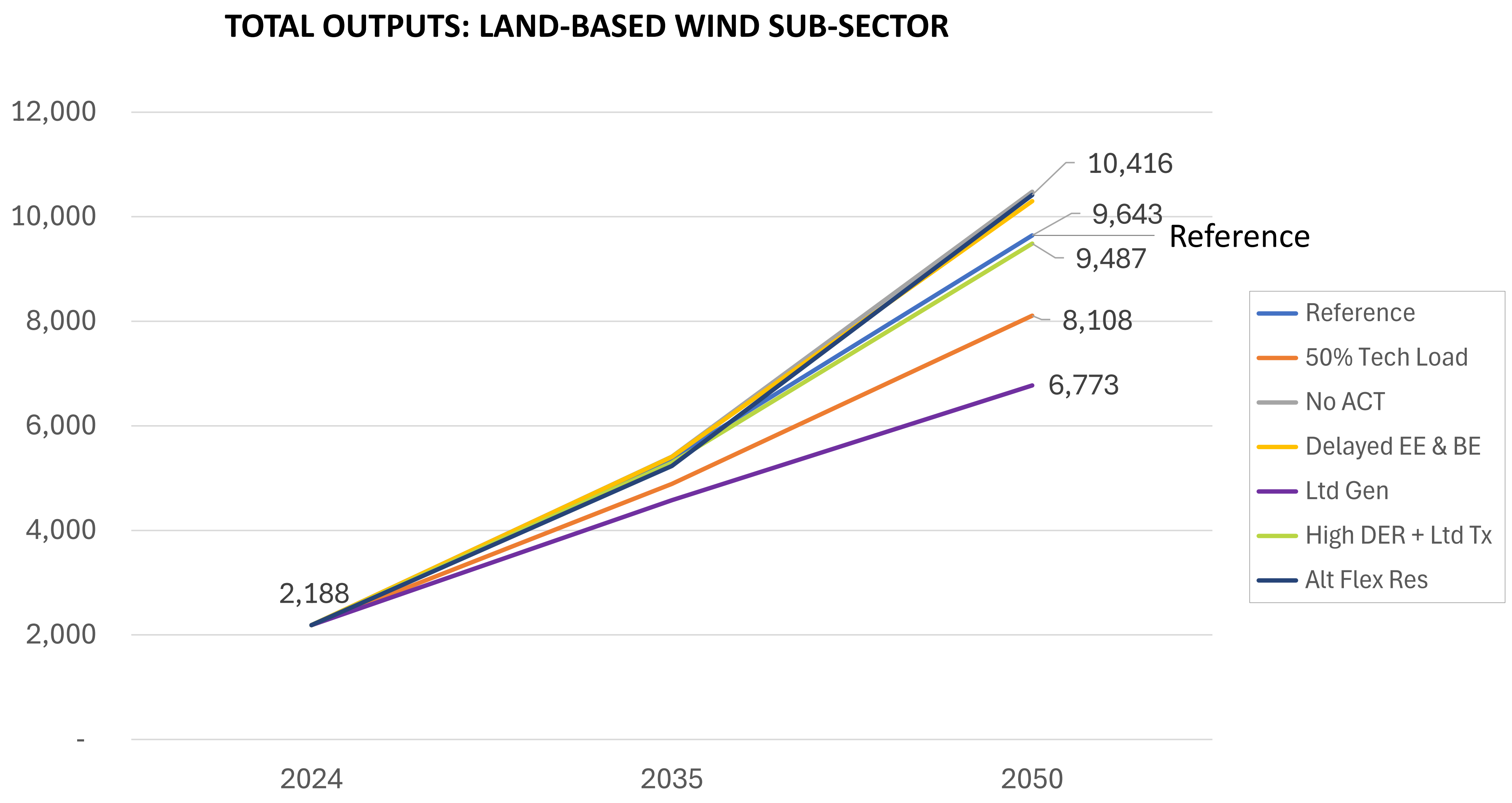
Alternative Scenario: Highest Impact Sub-Sectors



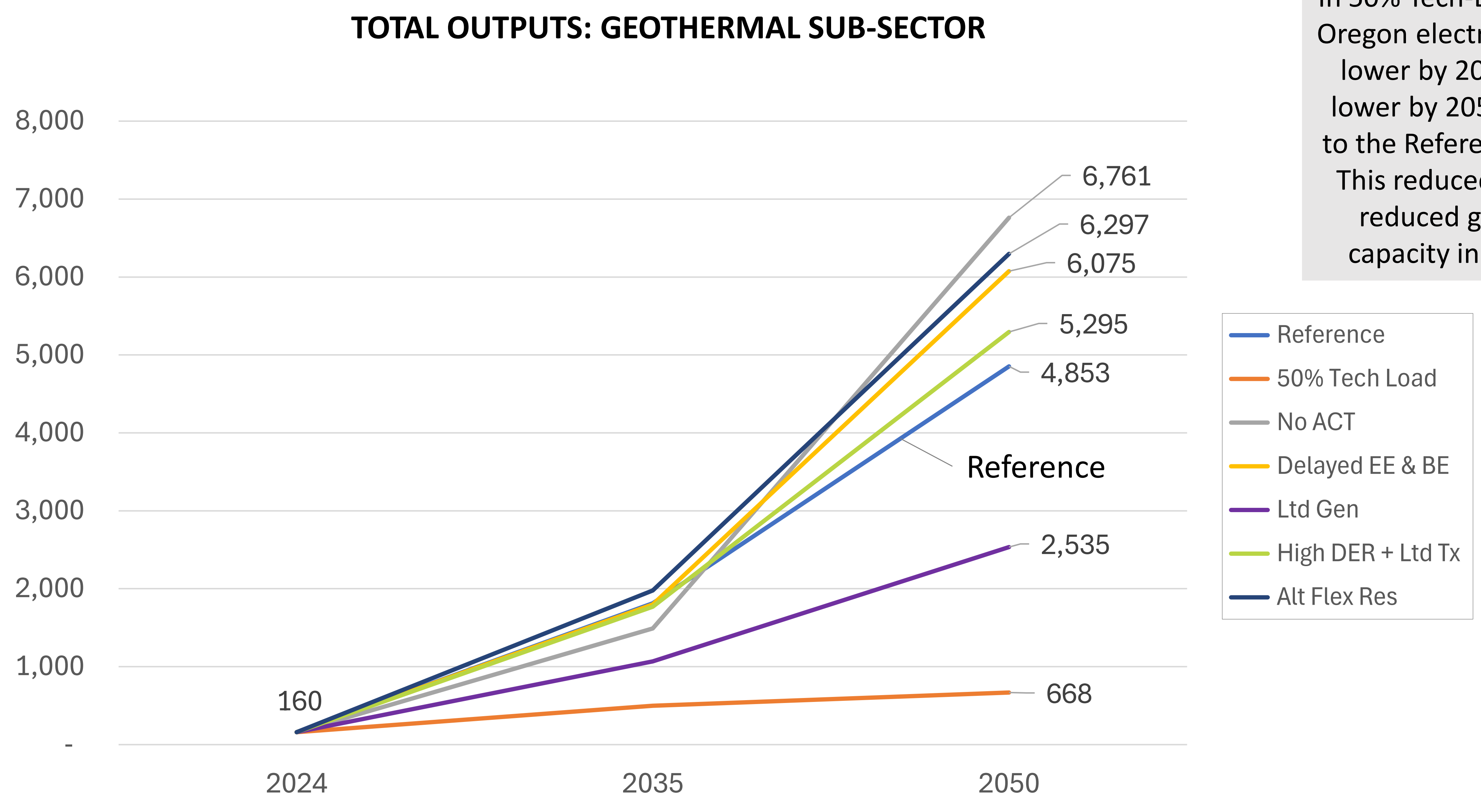
Alternative Scenario: Highest Impact Sub-Sectors



Alternative Scenario: Highest Impact Sub-Sectors



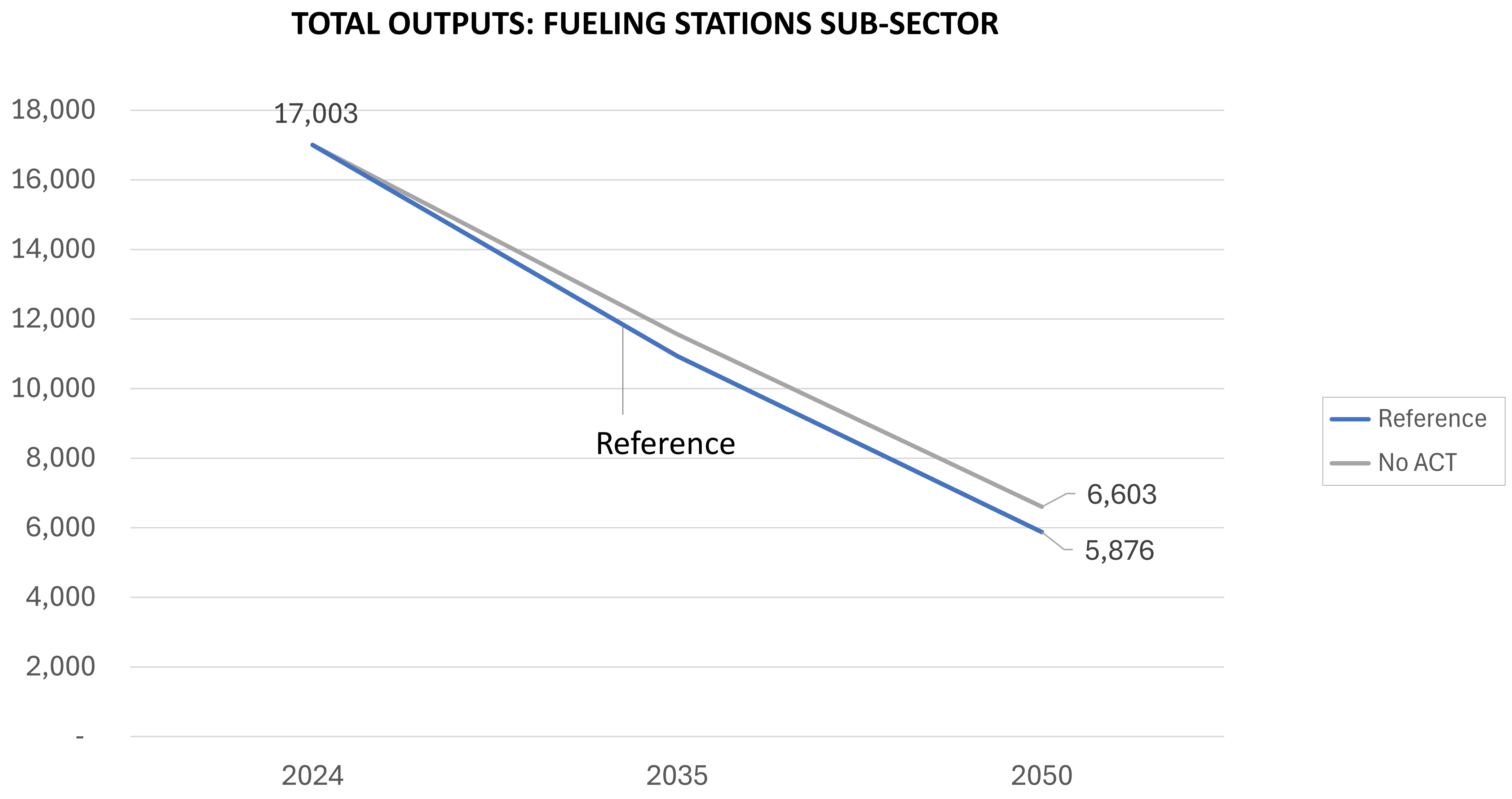
Alternative Scenario: Highest Impact Sub-Sectors



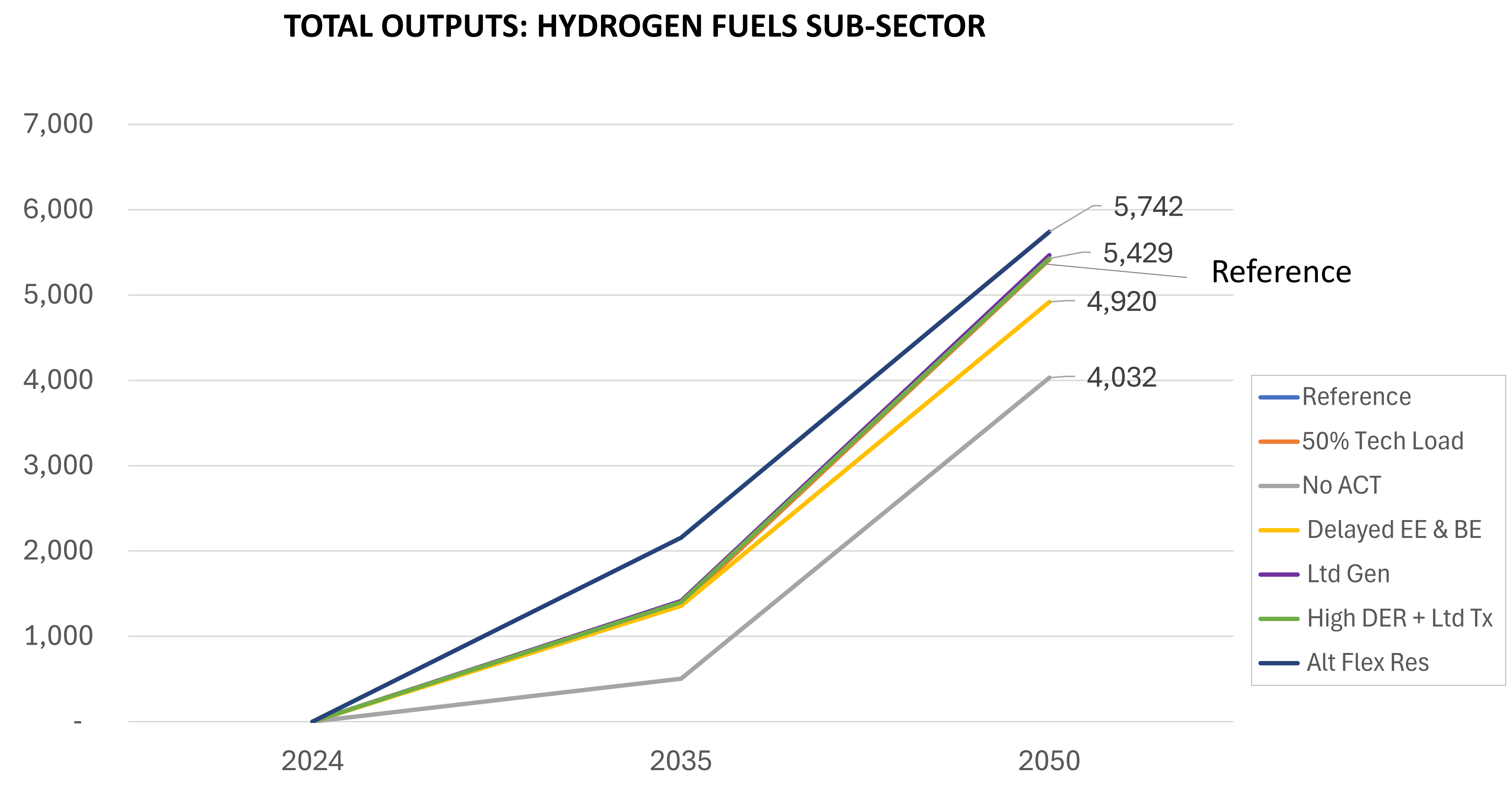
In 50% Tech-Load scenario, Oregon electric load is 12% lower by 2035 and 14% lower by 2050 compared to the Reference scenario. This reduced load led to reduced geothermal capacity in the model.

Geothermal jobs in 2035 are in advance of 2040 online date.

Alternative Scenario: Highest Impact Sub-Sectors

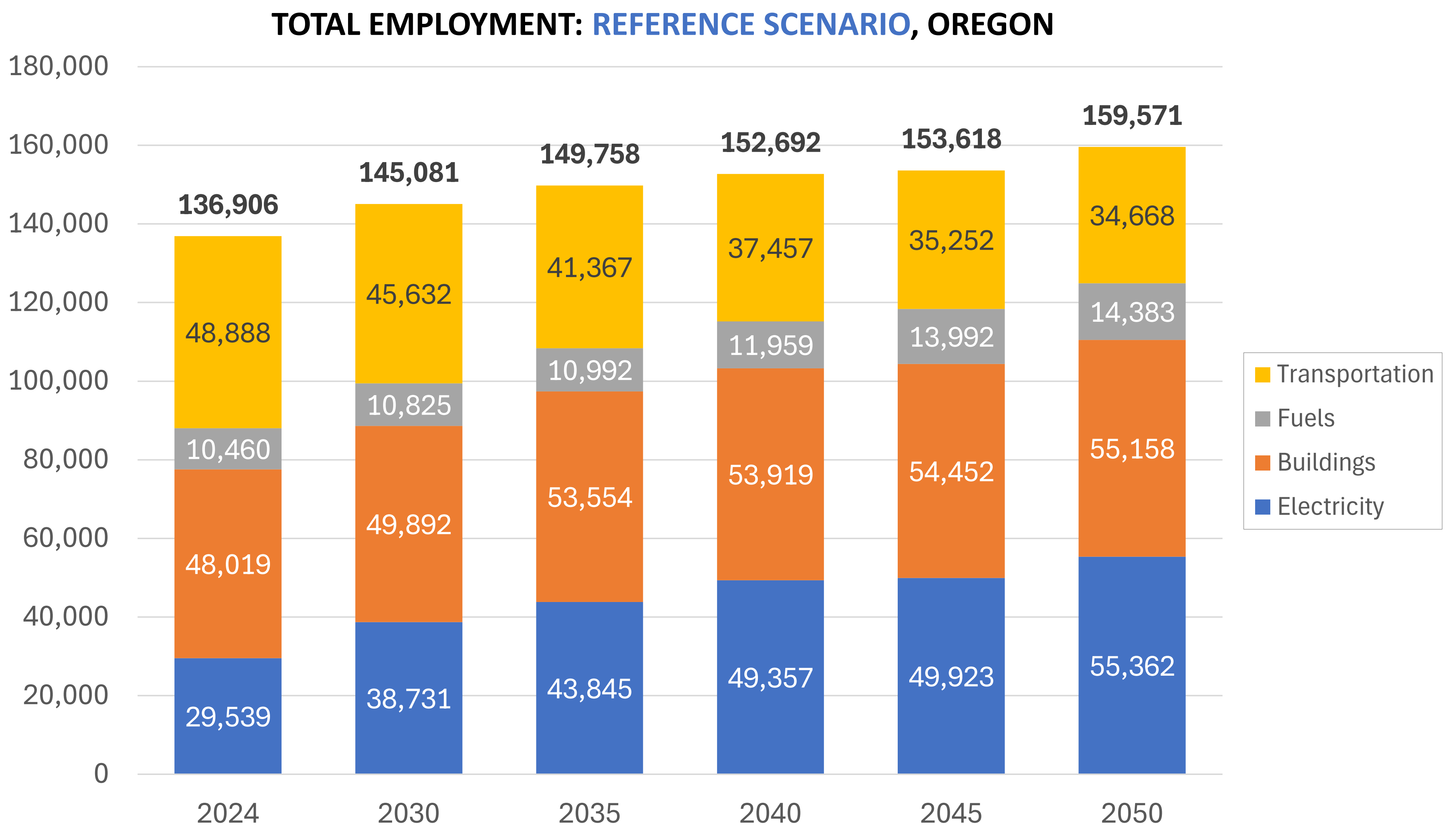


Alternative Scenario: Highest Impact Sub-Sectors

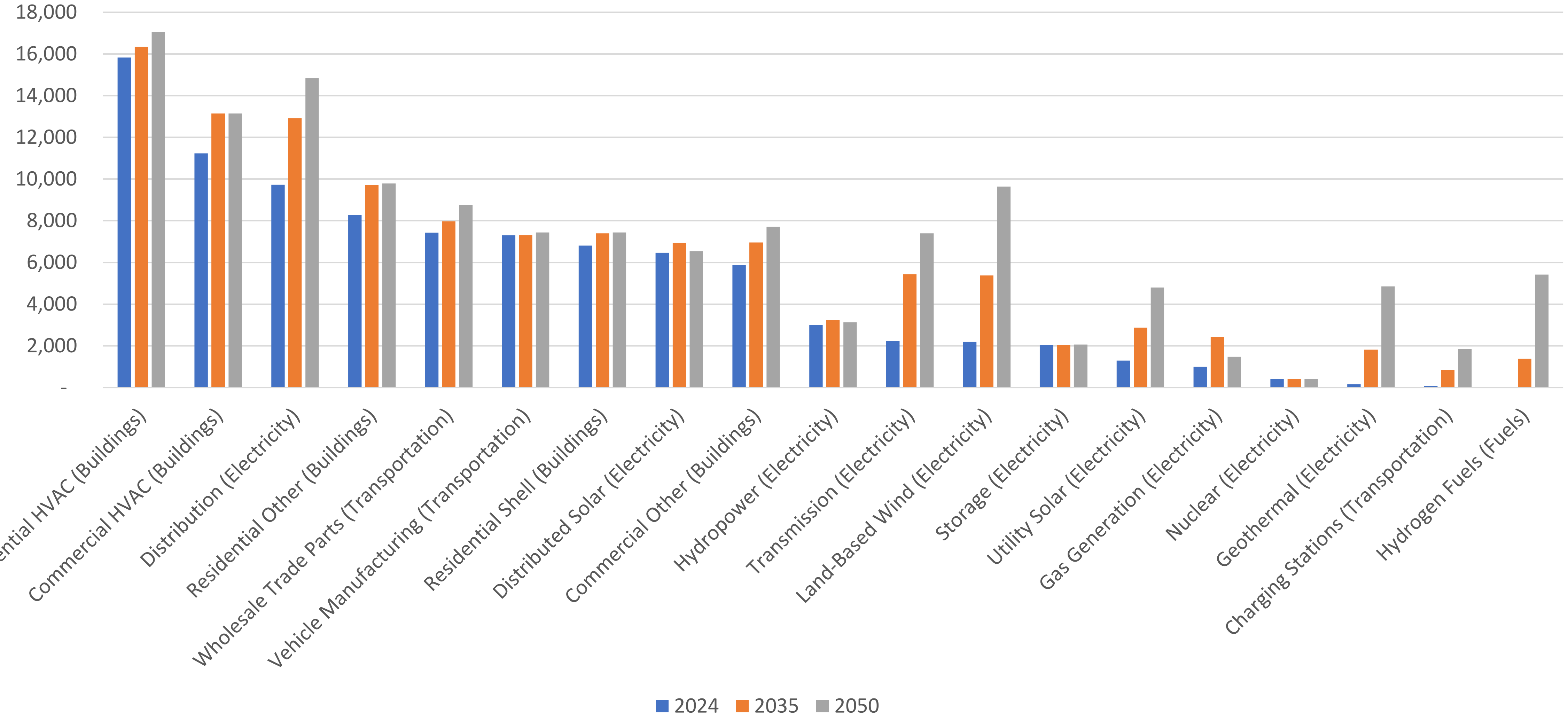


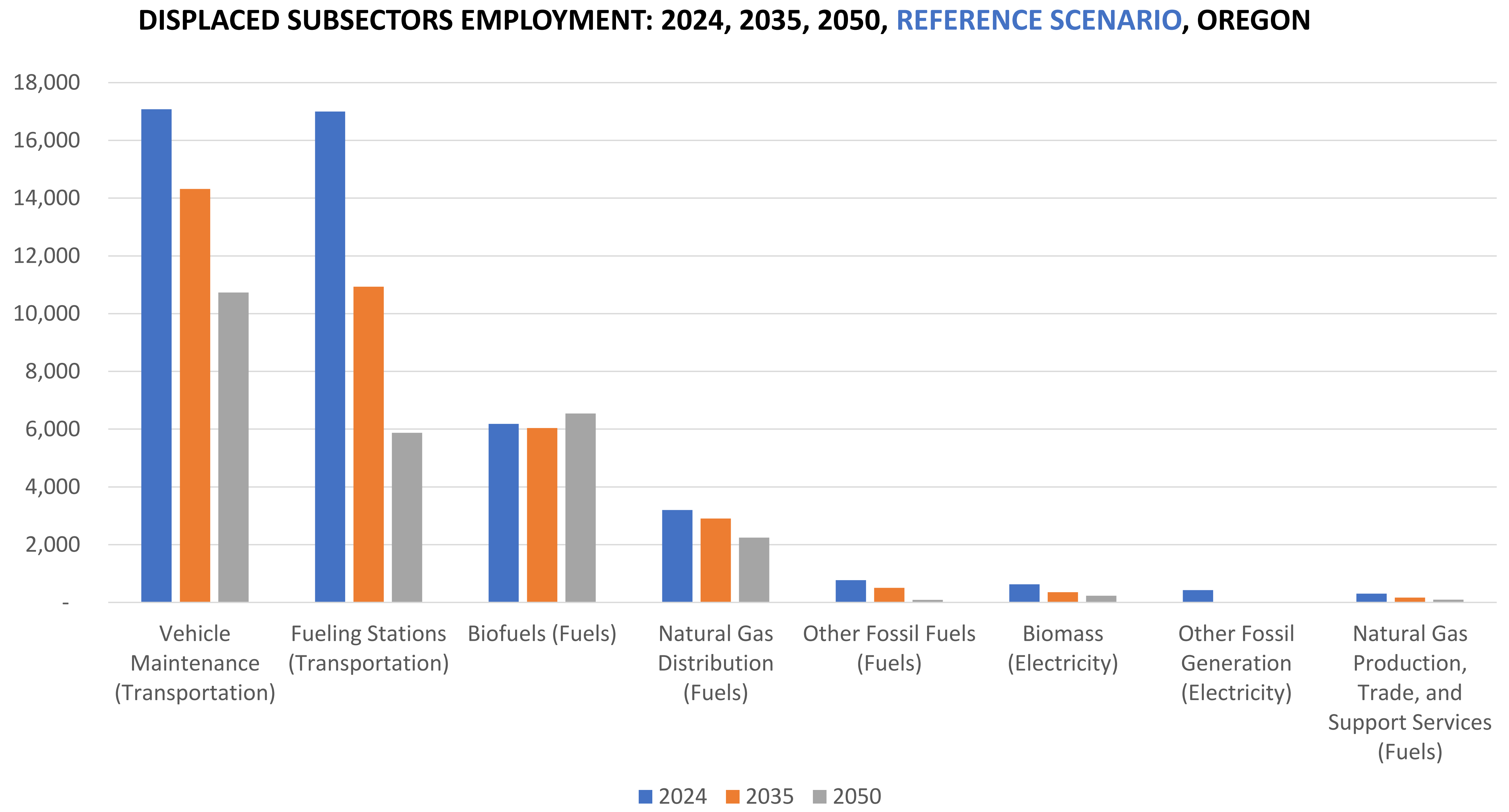
Appendix

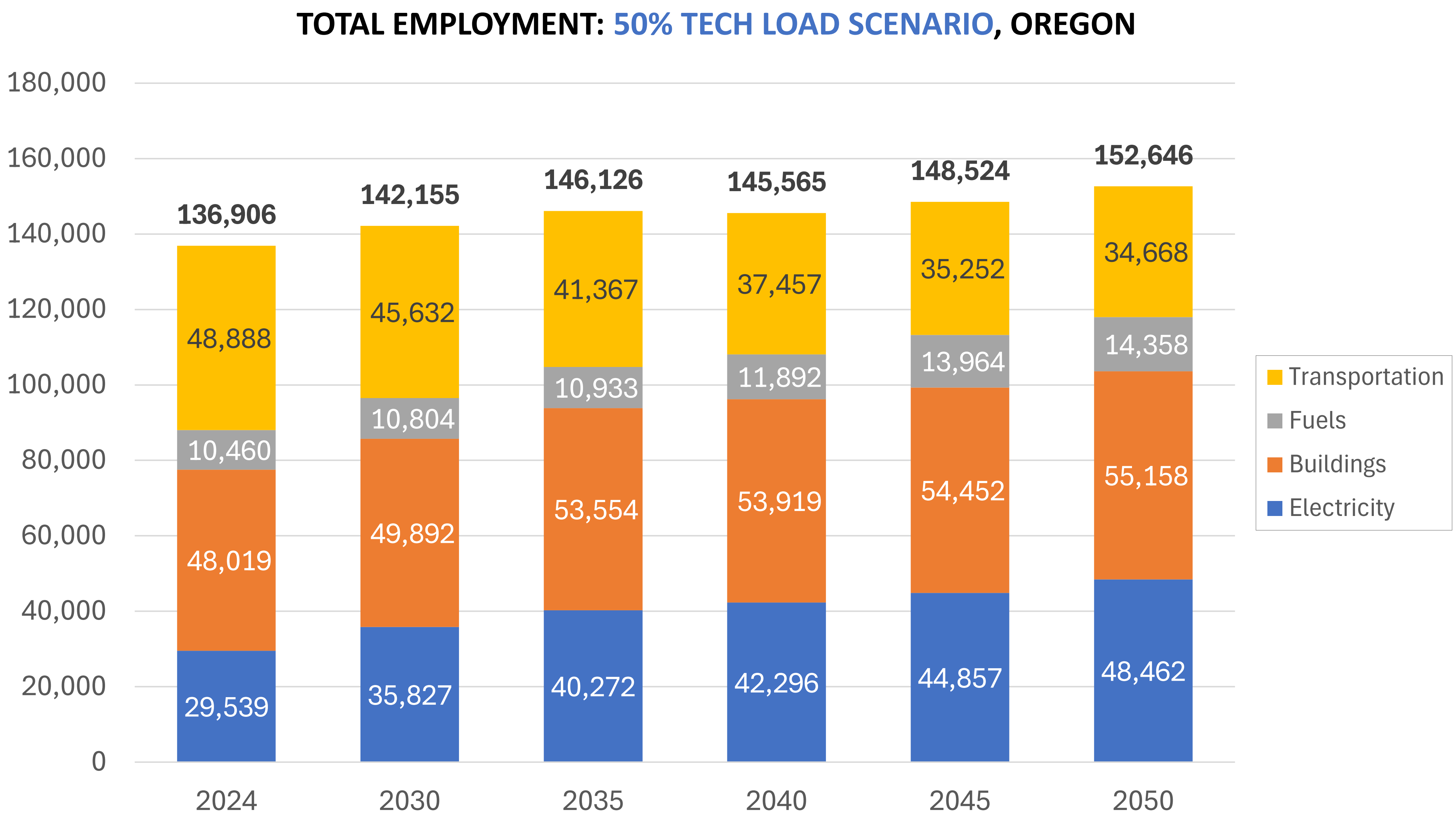
Key Findings Across Scenarios - Oregon


TOTAL EMPLOYMENT: REFERENCE SCENARIO, OREGON
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
136,906
145,081
149,758
152,692
153,618
159,571
48,888
10,460
48,019
29,539
45,632
10,825
49,892
38,731
41,367
10,992
53,554
43,845
37,457
11,959
53,919
49,357
35,252
13,992
54,452
49,923
34,668
14,383
55,158
55,362
2024
2030
2035
2040
2045
2050
Transportation
Fuels
Buildings
Electricity

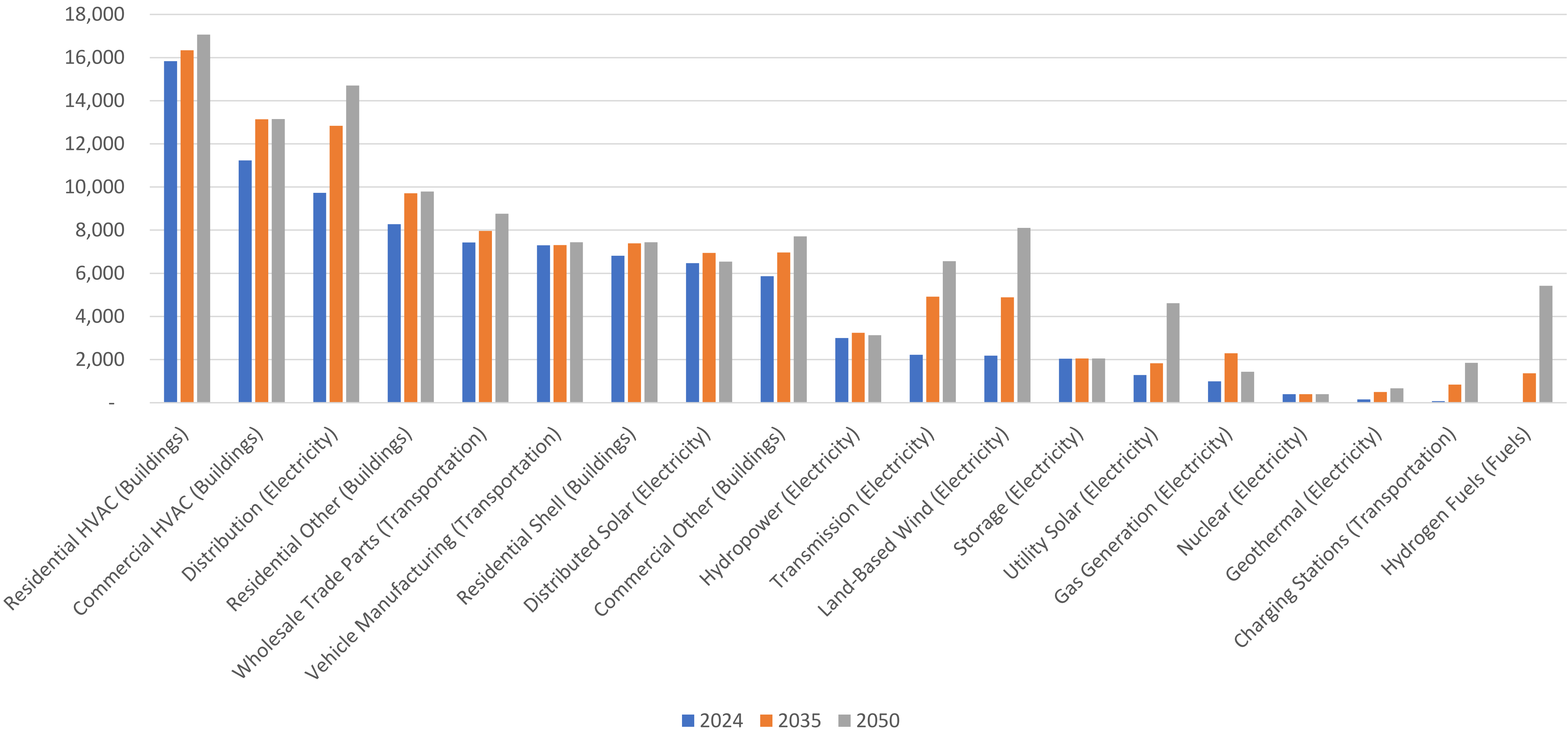
GROWTH SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, REFERENCE SCENARIO, OREGON

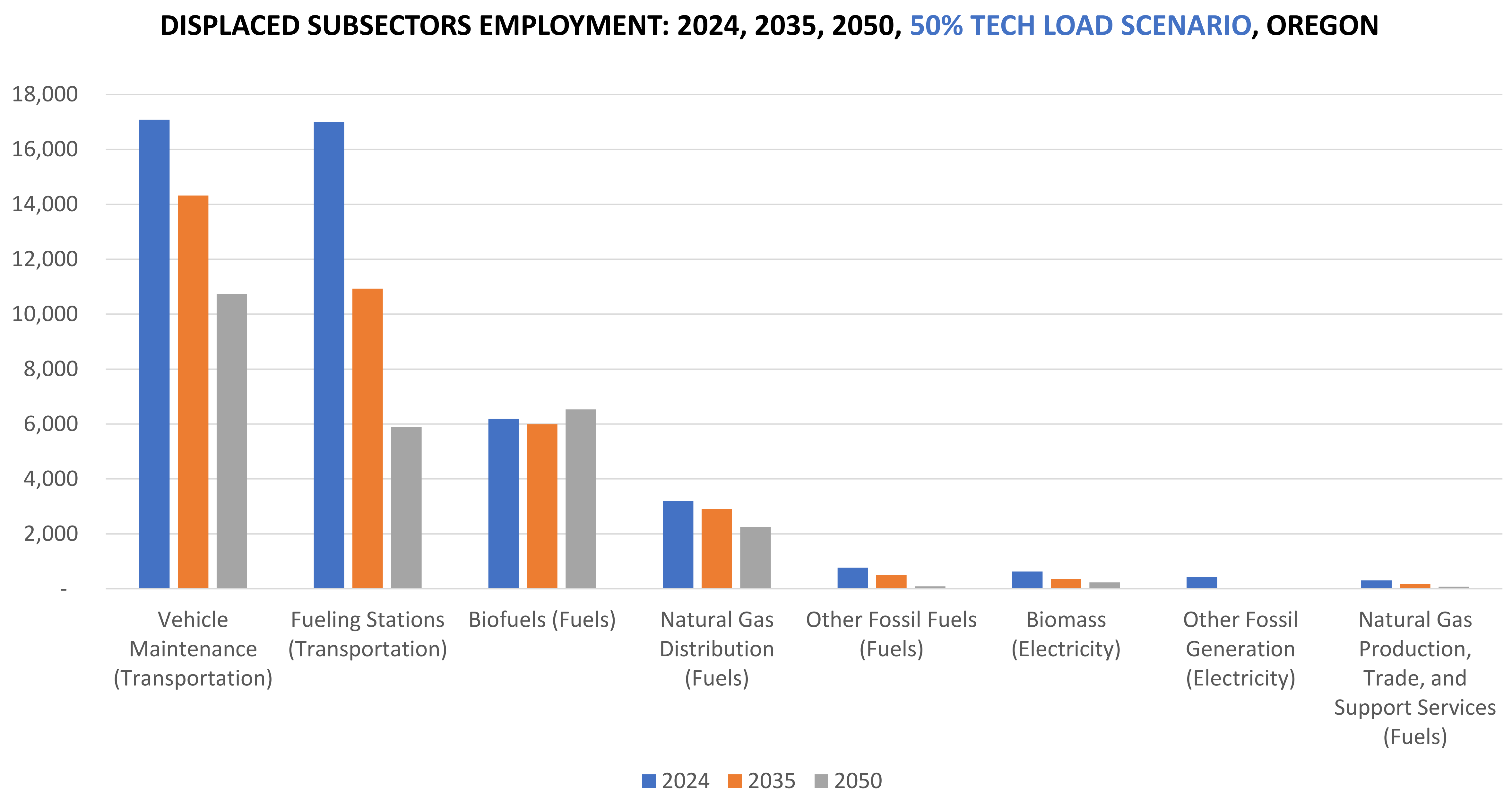


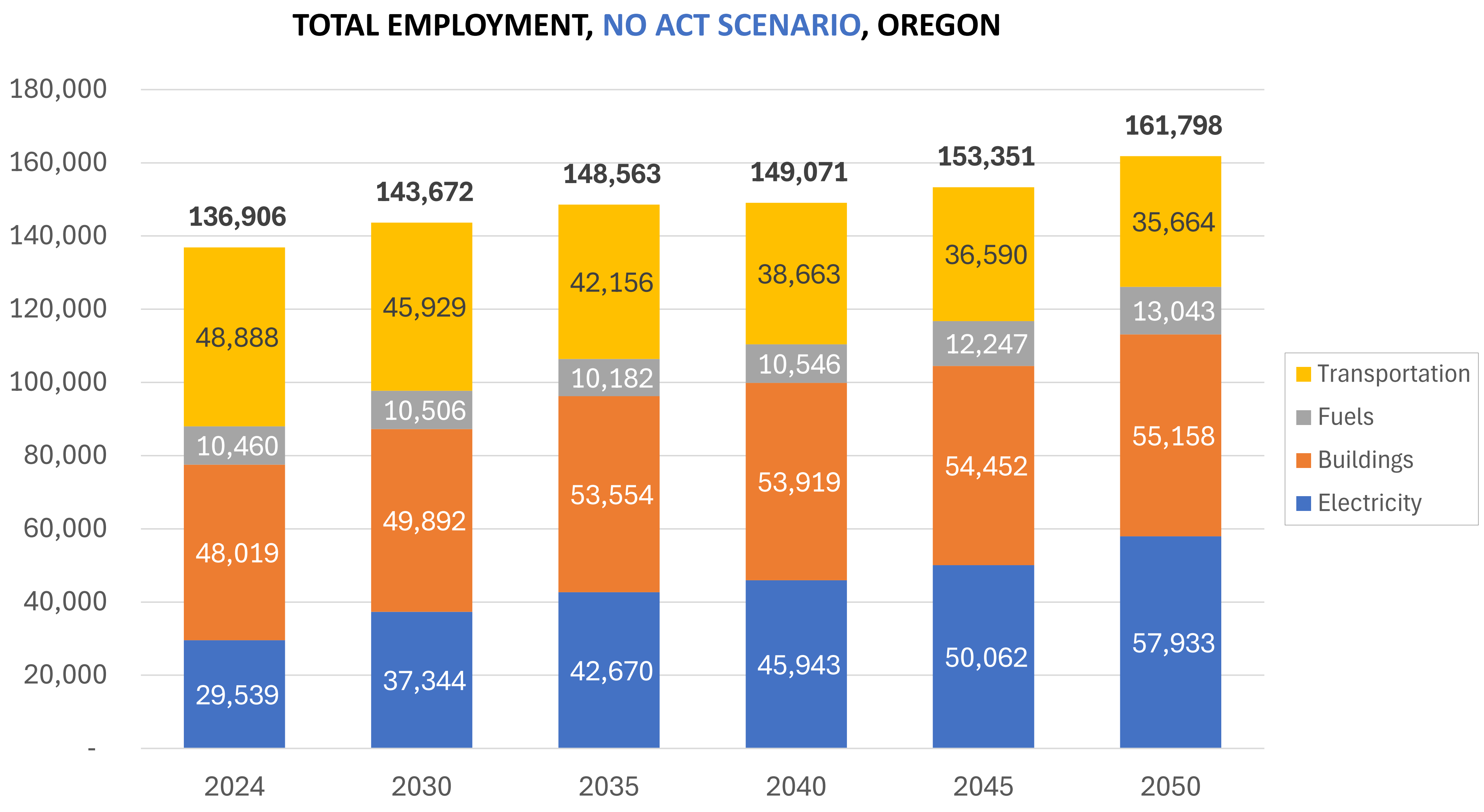

DISPLACED SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, REFERENCE SCENARIO, OREGON
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
-
Vehicle Maintenance (Transportation)
Fueling Stations (Transportation)
Biofuels (Fuels)
Natural Gas Distribution (Fuels)
Other Fossil Fuels (Fuels)
Biomass (Electricity)
Other Fossil Generation (Electricity)
Natural Gas Production, Trade, and Support Services (Fuels)
2024
2035
2050


TOTAL EMPLOYMENT: 50% TECH LOAD SCENARIO, OREGON
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
136,906
142,155
146,126
145,565
148,524
152,646
48,888
45,632
41,367
37,457
35,252
34,668
10,460
10,804
10,933
11,892
13,964
14,358
48,019
49,892
53,554
53,919
54,452
55,158
29,539
35,827
40,272
42,296
44,857
48,462
2024
2030
2035
2040
2045
2050
Transportation
Fuels
Buildings
Electricity

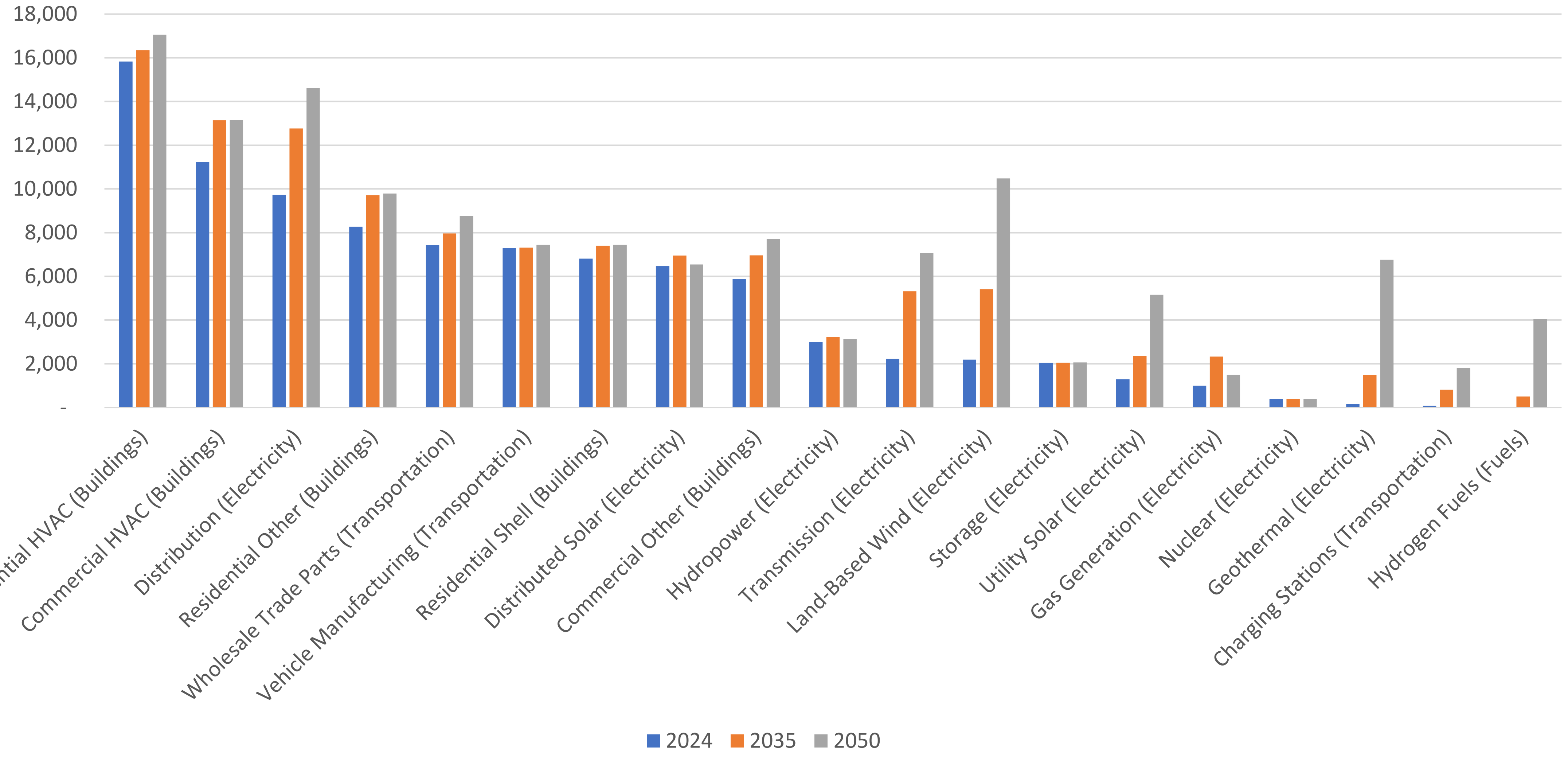
GROWTH SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, 50% TECH LOAD SCENARIO, OREGON



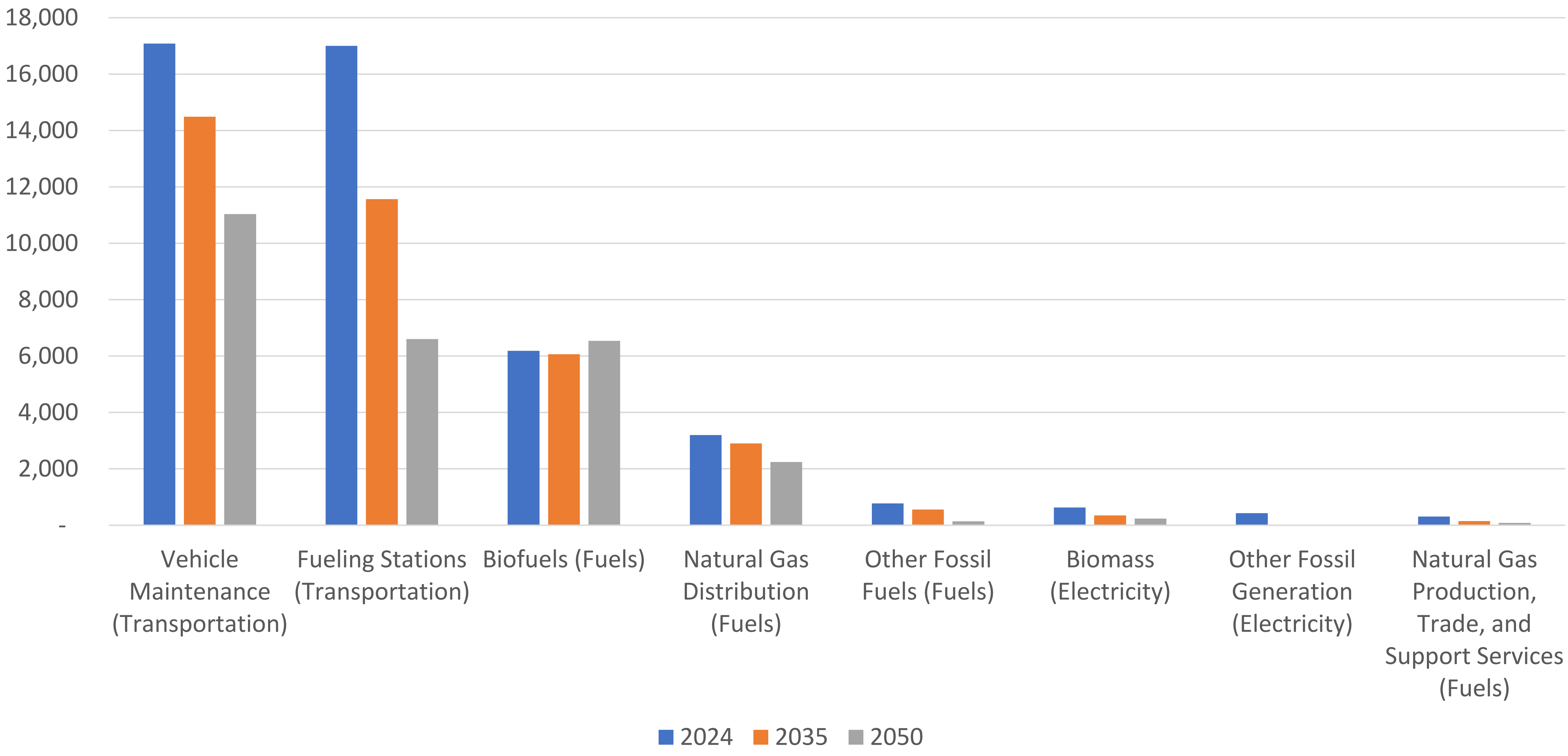

DISPLACED SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, 50% TECH LOAD SCENARIO, OREGON
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
-
Vehicle Maintenance (Transportation)
Fueling Stations (Transportation)
Biofuels (Fuels)
Natural Gas Distribution (Fuels)
Other Fossil Fuels (Fuels)
Biomass (Electricity)
Other Fossil Generation (Electricity)
Natural Gas Production, Trade, and Support Services (Fuels)
2024
2035
2050

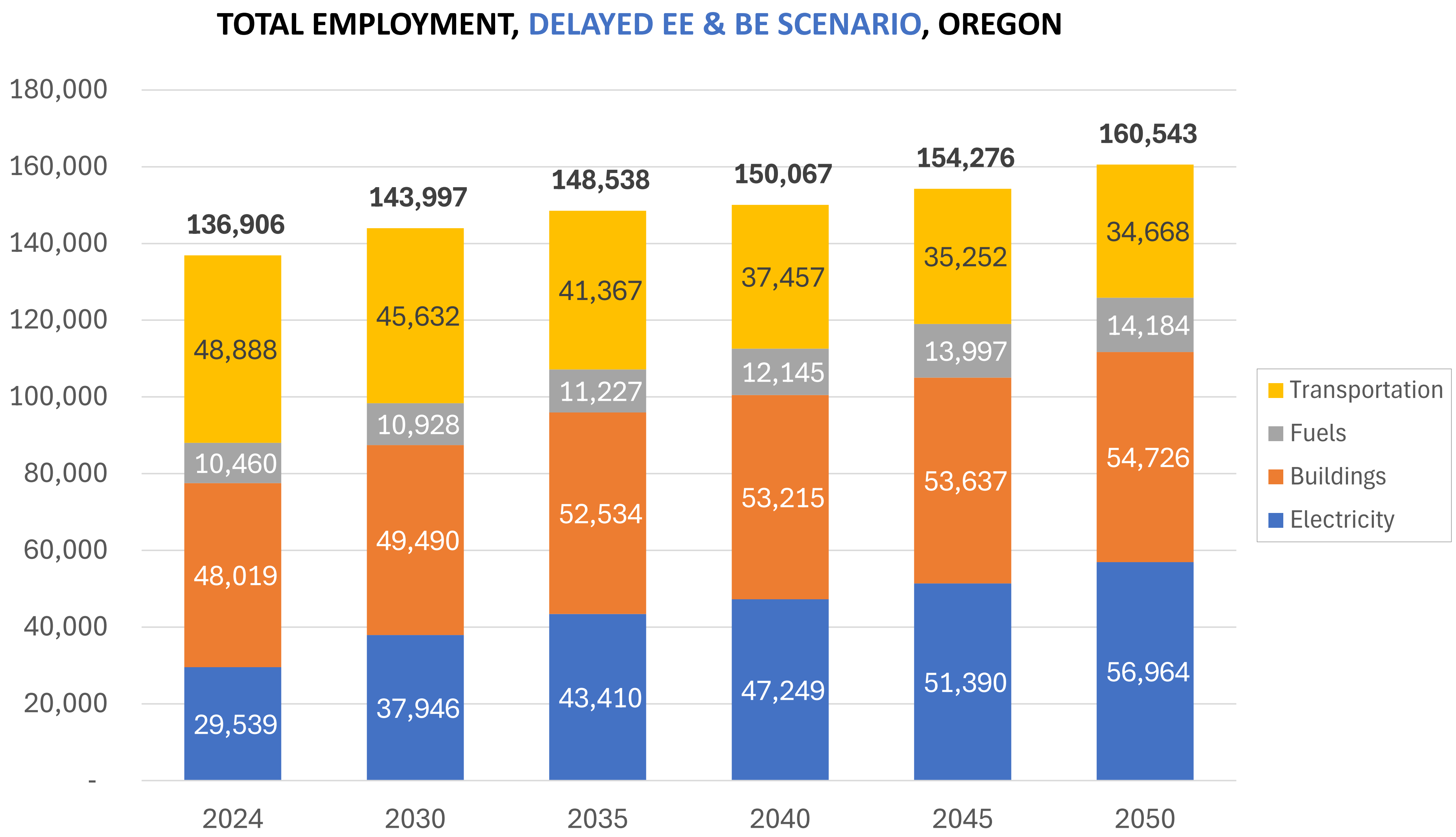

TOTAL EMPLOYMENT, NO ACT SCENARIO, OREGON
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
2024
2030
2035
2040
2045
2050
136,906
143,672
148,563
149,071
153,351
161,798
48,888
45,929
42,156
38,663
36,590
35,664
10,460
10,506
10,182
10,546
12,247
13,043
48,019
49,892
53,554
53,919
54,452
55,158
29,539
37,344
42,670
45,943
50,062
57,933
Transportation
Fuels
Buildings
Electricity

GROWTH SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, NO ACT SCENARIO, OREGON

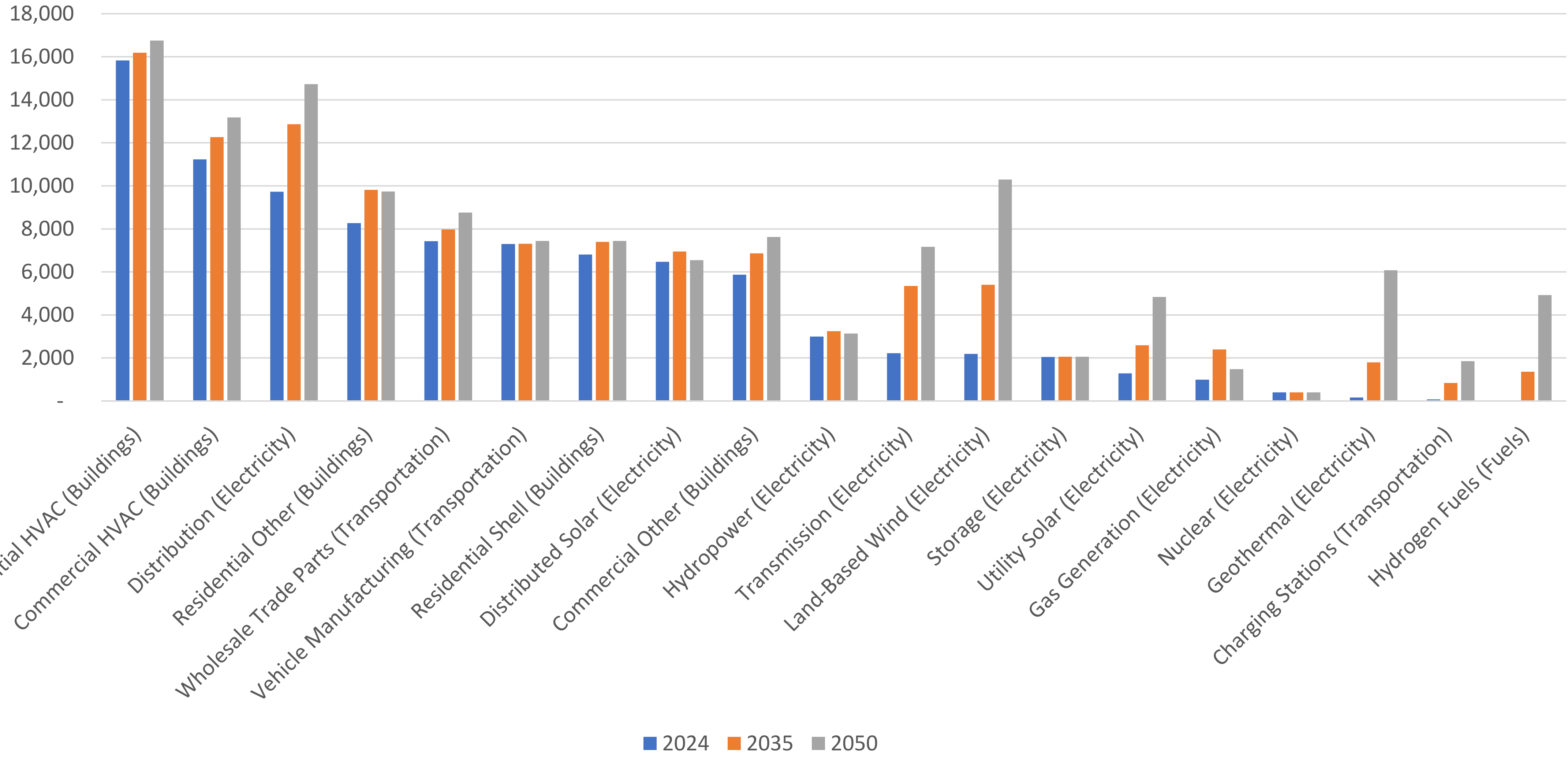


DISPLACED SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, NO ACT SCENARIO, OREGON

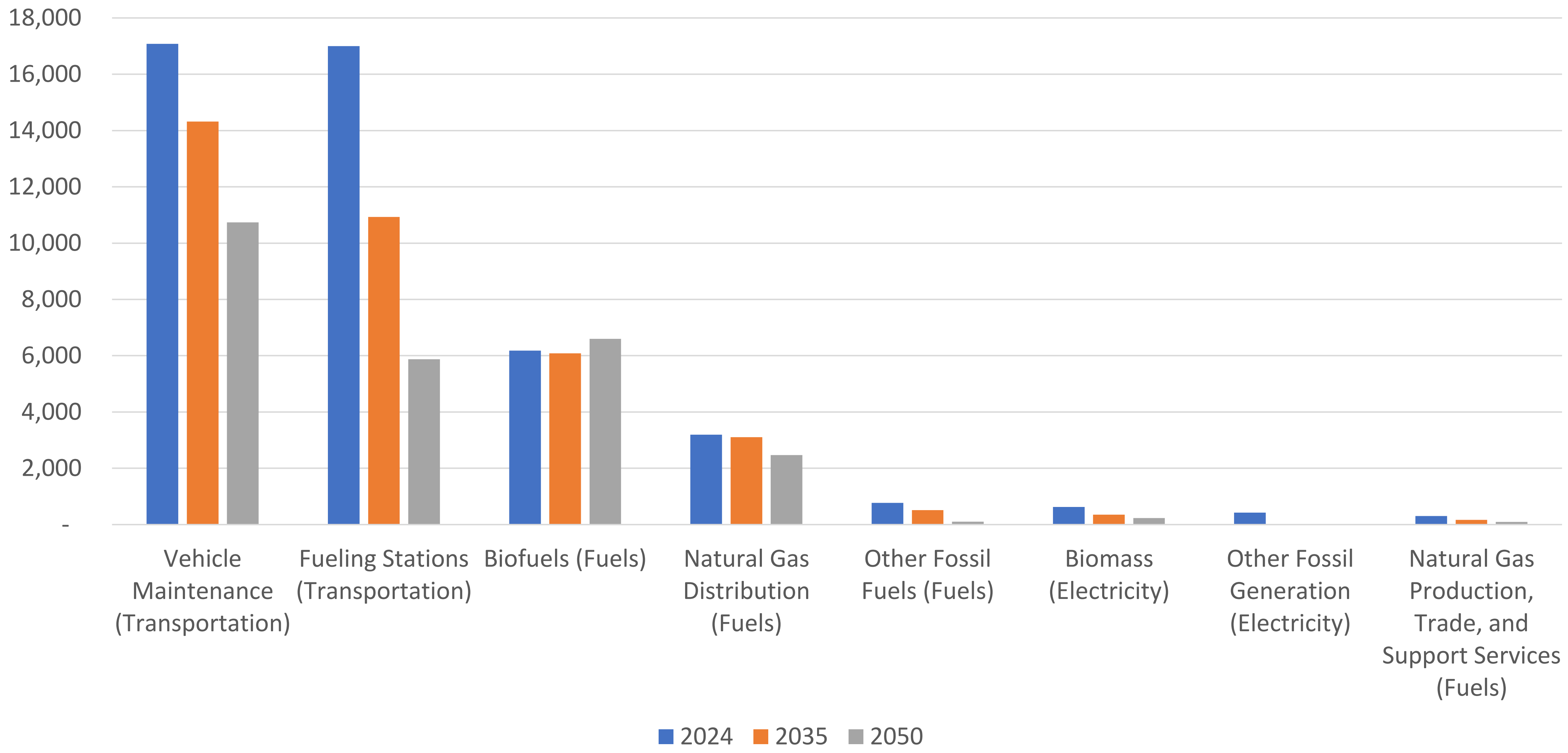


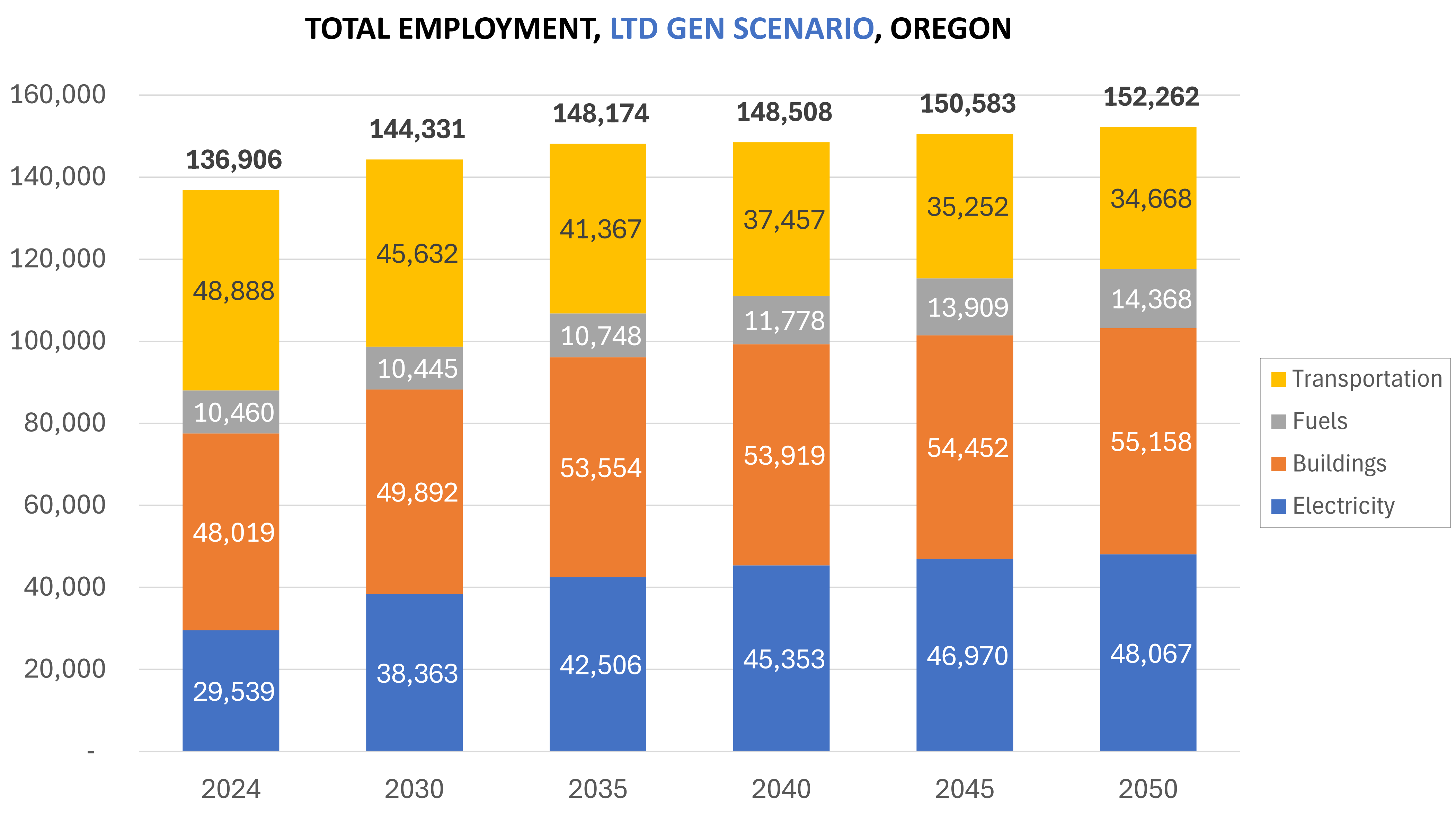

TOTAL EMPLOYMENT, DELAYED EE & BE SCENARIO, OREGON
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
136,906
48,888
10,460
48,019
29,539
143,997
45,632
10,928
49,490
37,946
148,538
41,367
11,227
52,534
43,410
150,067
37,457
12,145
53,215
47,249
154,276
35,252
13,997
53,637
51,390
160,543
34,668
14,184
54,726
56,964
2024
2030
2035
2040
2045
2050
Transportation
Fuels
Buildings
Electricity

GROWTH SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, DELAYED EE & BE SCENARIO, OREGON



DISPLACED SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, DELAYED EE & BE SCENARIO, OREGON




TOTAL EMPLOYMENT, LTD GEN SCENARIO, OREGON
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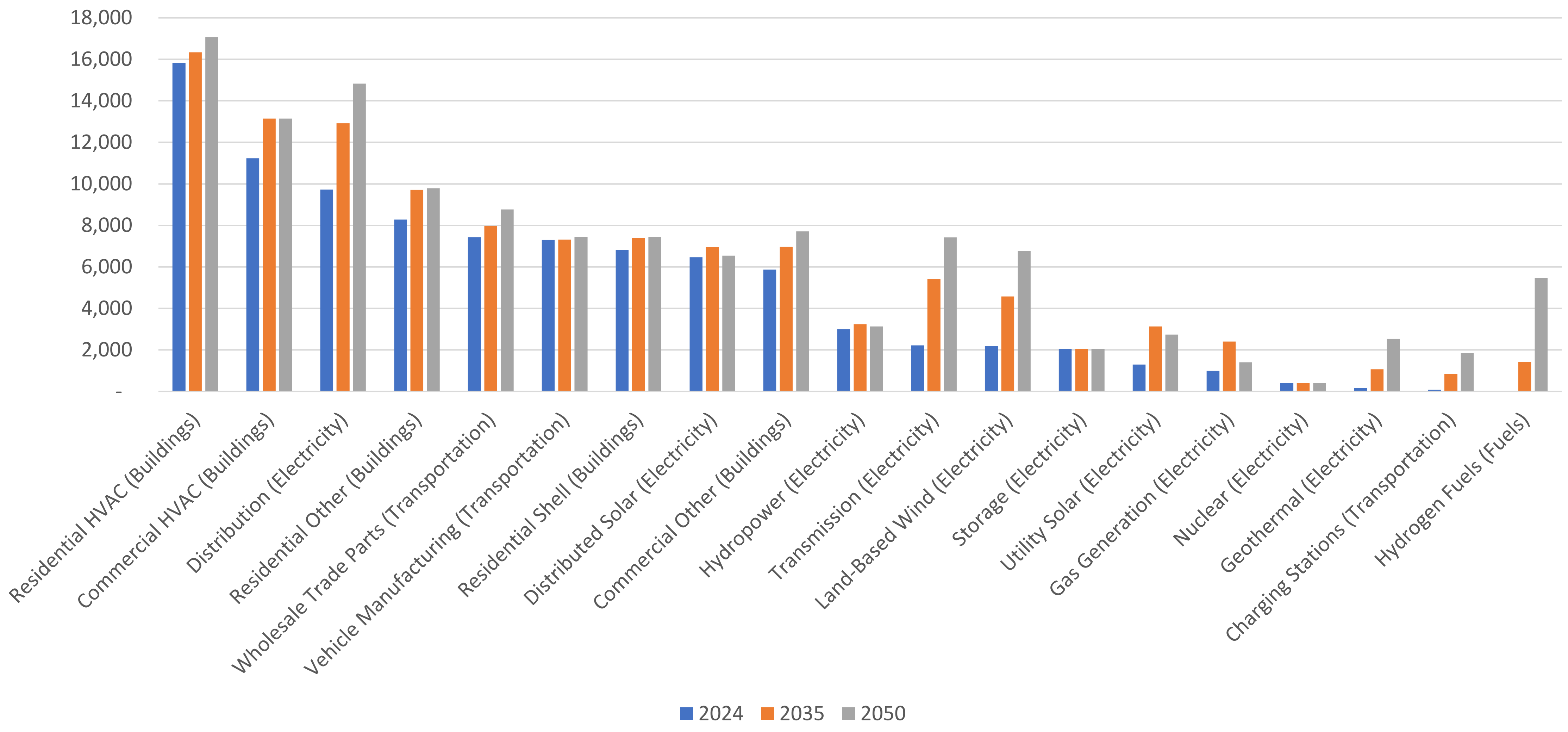
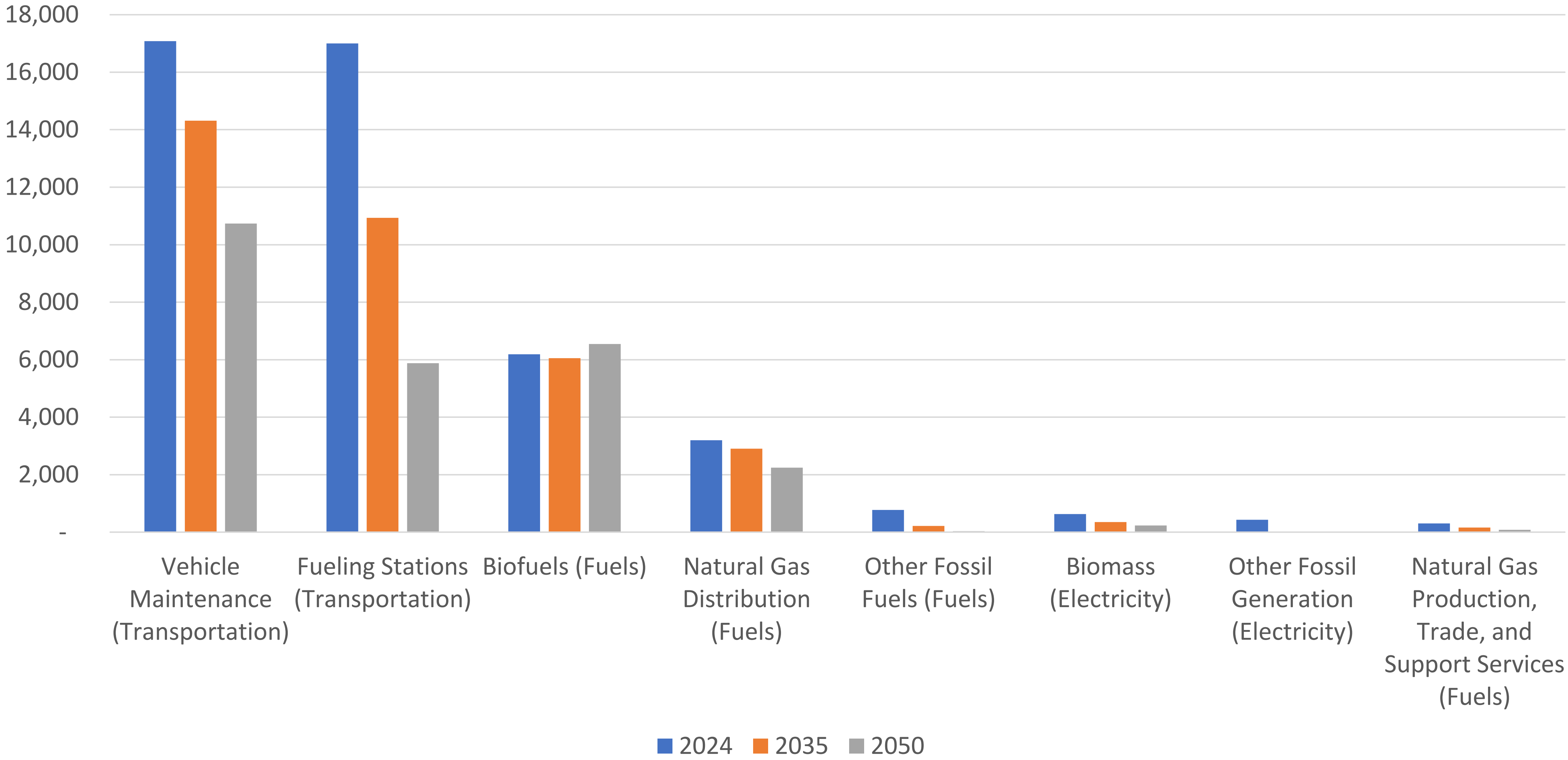
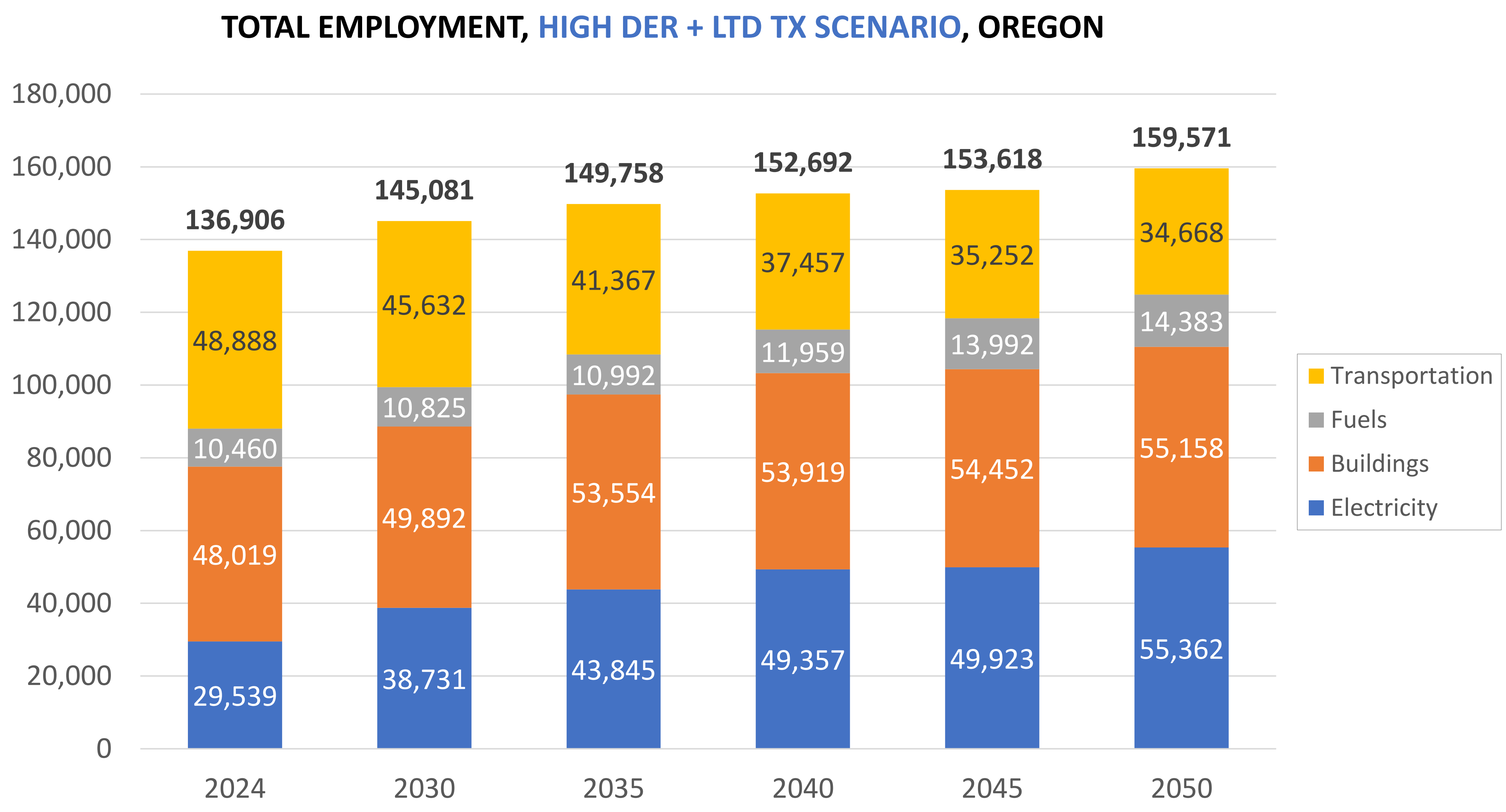
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
136,906
144,331
148,174
148,508
150,583
152,262
48,888
45,632
41,367
37,457
35,252
34,668
10,460
10,445
10,748
11,778
13,909
14,368
48,019
49,892
53,554
53,919
54,452
55,158
29,539
38,363
42,506
45,353
46,970
48,067
2024
2030
2035
2040
2045
2050
Transportation
Fuels
Buildings
Electricity

GROWTH SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, LTD GEN SCENARIO, OREGON

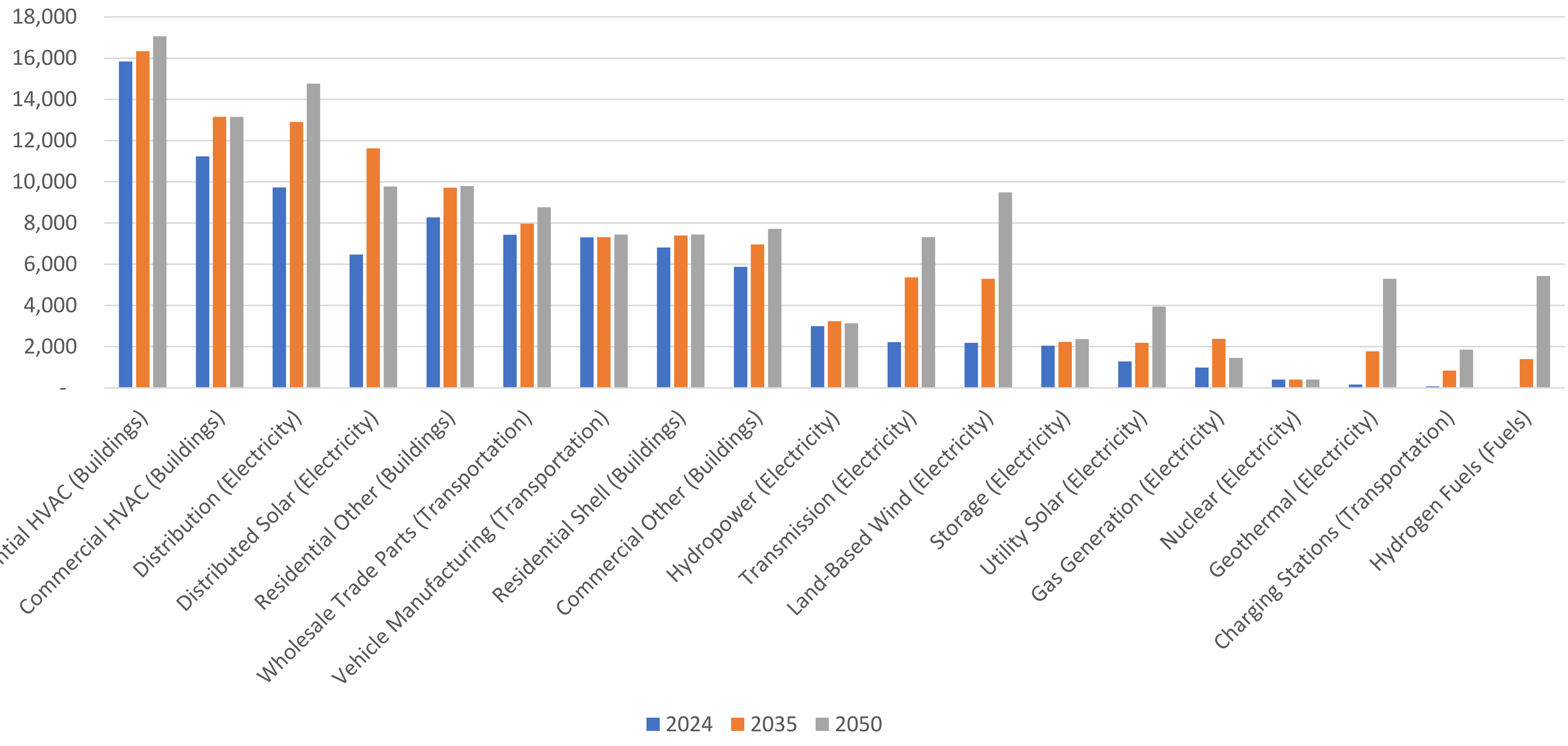


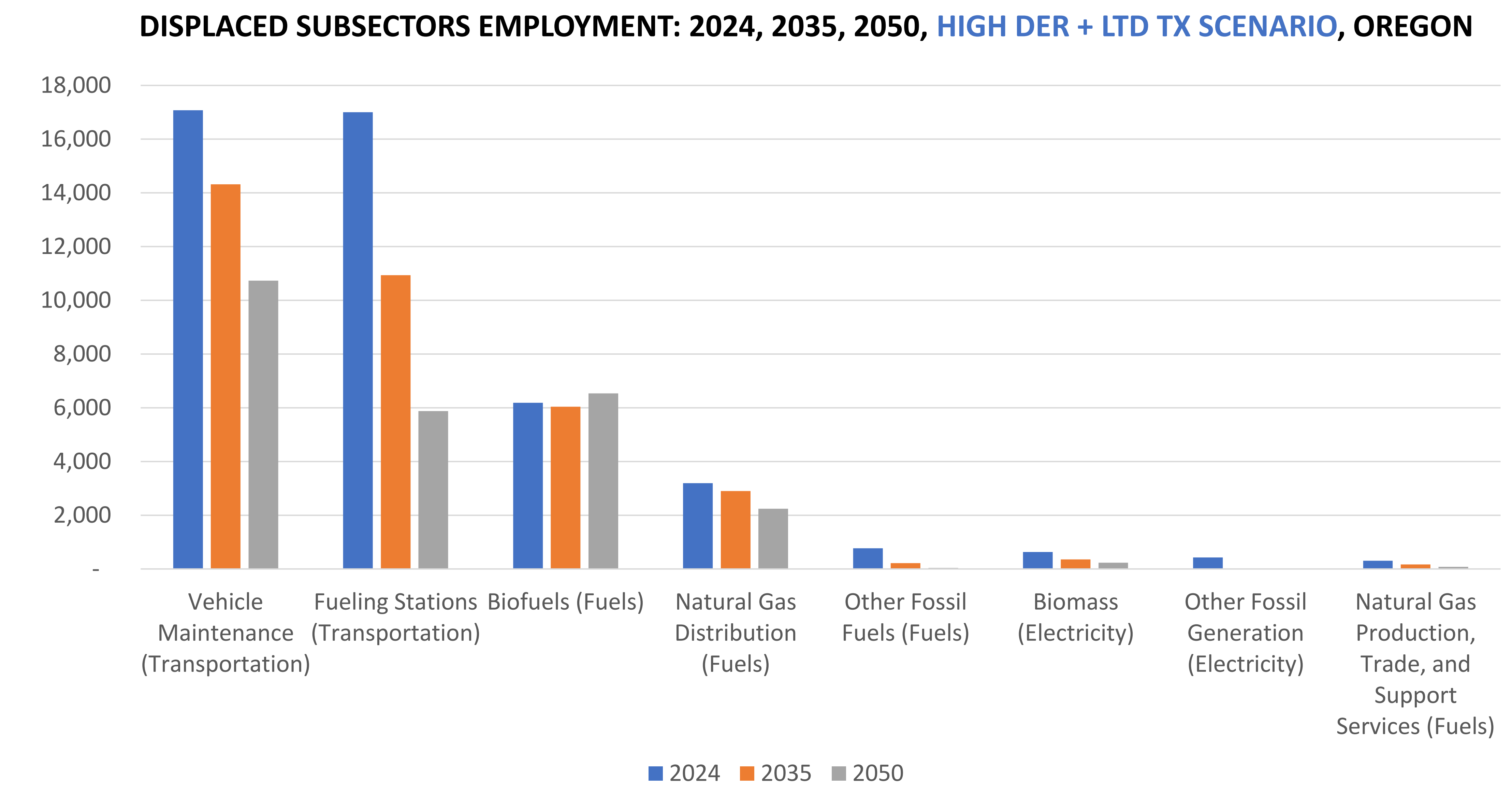
DISPLACED SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, LTD GEN SCENARIO, OREGON

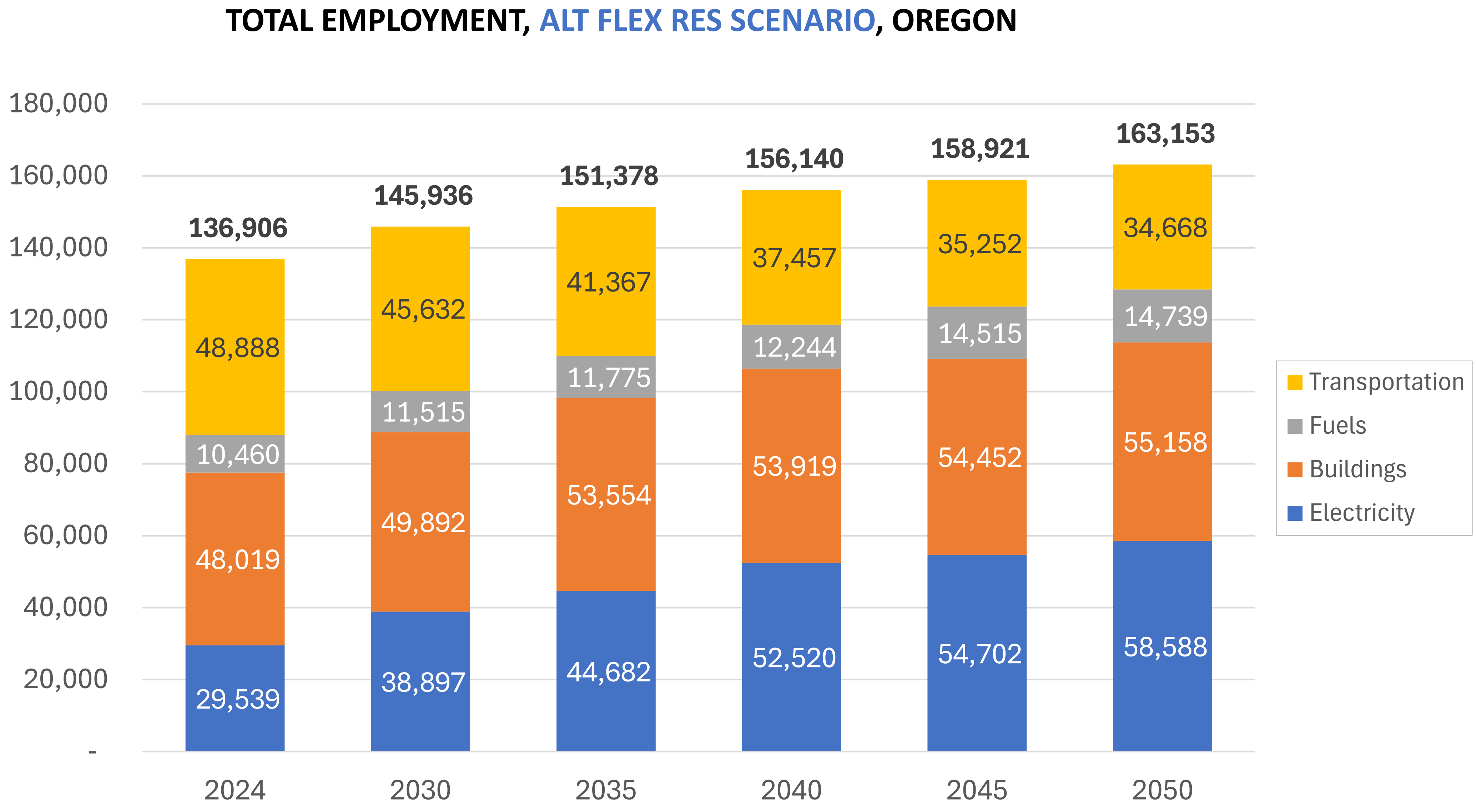



TOTAL EMPLOYMENT, HIGH DER + LTD TX SCENARIO, OREGON
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
136,906
145,081
149,758
152,692
153,618
159,571
48,888
10,460
48,019
29,539
45,632
10,825
49,892
38,731
41,367
10,992
53,554
43,845
37,457
11,959
53,919
49,357
35,252
13,992
54,452
49,923
34,668
14,383
55,158
55,362
2024
2030
2035
2040
2045
2050
Transportation
Fuels
Buildings
Electricity

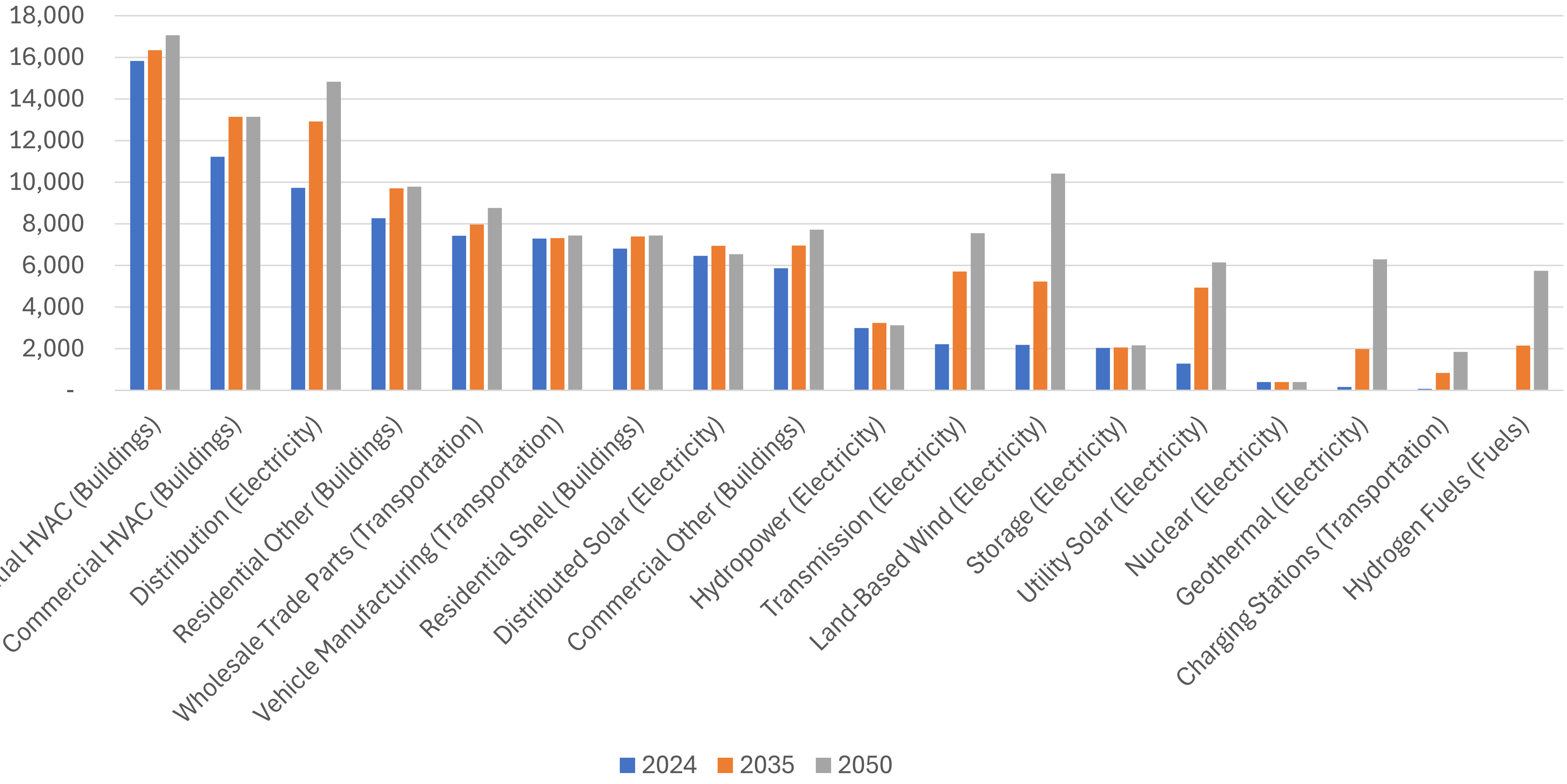
GROWTH SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, HIGH DER + LTD TX SCENARIO, OREGON




DISPLACED SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, HIGH DER + LTD TX SCENARIO, OREGON
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
-
Vehicle Maintenance (Transportation)
Fueling Stations (Transportation)
Biofuels (Fuels)
Natural Gas Distribution (Fuels)
Other Fossil Fuels (Fuels)
Biomass (Electricity)
Other Fossil Generation (Electricity)
Natural Gas Production, Trade, and Support Services (Fuels)
2024
2035
2050


TOTAL EMPLOYMENT, ALT FLEX RES SCENARIO, OREGON
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
2024
2030
2035
2040
2045
2050
136,906
145,936
151,378
156,140
158,921
163,153
48,888
45,632
41,367
37,457
35,252
34,668
10,460
11,515
11,775
12,244
14,515
14,739
48,019
49,892
53,554
53,919
54,452
55,158
29,539
38,897
44,682
52,520
54,702
58,588
Transportation
Fuels
Buildings
Electricity

GROWTH SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, ALT FLEX RES SCENARIO, OREGON



DISPLACED SUBSECTORS EMPLOYMENT: 2024, 2035, 2050, ALT FLEX RES SCENARIO, OREGON