Projecting the Demand for Electric Vehicle Related Occupations

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W.E. UPJOHN INSTITUTE
FOR EMPLOYMENT RESEARCH

Identifying EV Occupations

EV Academy

Talent Pipeline Management

Talent Action Team

MEDC

Upjohn Institute

Literature review

Data on occupational staffing patterns in EV related industries

Identifying EV Occupations

Maintenance and repair workers

Assemblers and Fabricators

Electrical and Electronic Engineering Technologists

Electrical engineers

Mechanical engineers

Computer occupations

Information Security Analysis

Information Security Engineers

Automotive Service Technicians and Mechanics

Industrial Machinery Mechanics

First Line Supervisors of Mechanics, Installers, and Repairers

Approaches to projecting net employment changes and annual job openings for occupations related to EV production and infrastructure

BLS national 10-year occupational projections

- 2021-2031 current projections, updated each September
- Forecasts population growth and labor force participation rates
- Uses a macro model of the economy to reach full employment in 10-years and project industry employment
- Uses occupational staffing patterns by industry to project occupational demand

Michigan 10-year occupational projections

- Released by the Department of Technology Management and Budget (DTMB), Labor Market Information Office (LMI)
- 2020-2030 current state level projections, released August 10, 2022
  - Prosperity region projections to be released in 2023
  - 2022-2032 state level projections to be released in 2024
- Uses same assumptions as BLS national model

Computer occupations related to EV

SOC Code	Occupation	Median Annual Earnings, 2021	Employment		Percent Change in Employment 2020-2030	Annual job openings, 2020-2030	Education typically required to enter the occupation
			2020	2030			
00-0000	**Total, All Occupations**	**55,160**	**4,279,580**	**4,654,510**	**8.8%**	**520,600**	
15-1211	Computer Systems Analysts	100,080	15,300	15,680	2.5%	1,100	BA
15-1212	Information Security Analysts	94,780	2,160	2,770	28.2%	235	BA
15-1221	Computer and Information Research Scientists	105,680	220	260	18.2%	20	Master's degree
15-1231	Computer Network Support Specialists	61,260	2,190	2,280	4.1%	170	Associate's degree
15-1232	Computer User Support Specialists	51,680	21,610	22,810	5.6%	1,710	Some college
15-1241	Computer Network Architects	109,700	3,370	3,430	1.8%	210	Bachelor's degree
15-1244	Network and Computer Systems Administrators	82,180	6,420	6,610	3.0%	435	BA
15-1245	Database Administrators and Architects	93,787	2,460	2,680	8.9%	210	BA
15-1251	Computer Programmers	80,560	3,650	3,180	-12.9%	175	BA
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	97,321	38,380	47,130	22.8%	3,965	BA
15-1257	Web Developers and Digital Interface Designers	74,223	2,670	2,900	8.6%	225	BA
15-1299	Computer Occupations, All Other	81,510	8,900	9,540	7.2%	730	BA

Engineering occupations related to EV

SOC Code	Occupation	Median Annual Earnings, 2021	Employment		Percent Change in Employment 2020-2030	Annual job openings, 2020-2030	Education typically required to enter the occupation
			2020	2030			
17-2071	Electrical Engineers	97,770	8,660	9,370	8.2%	645	BA
17-2131	Materials Engineers	82,980	1,070	1,210	13.1%	80	BA
17-2141	Mechanical Engineers	91,610	40,950	45,070	10.1%	2,920	BA
17-2199	Engineers, All Other	96,050	10,230	10,860	6.2%	725	BA
17-3012	Electrical and Electronics Drafters	60,170	440	480	9.1%	45	Assoc
17-3023	Electrical and Electronics Engineering Technicians	68,270	1,860	1,960	5.4%	185	Assoc
17-3024	Electro-Mechanical Technicians	60,600	340	340	0.0%	30	Assoc
17-3026	Industrial Engineering Technicians	59,250	3,410	3,750	10.0%	360	Assoc
17-3027	Mechanical Engineering Technicians	64,990	4,020	4,360	8.5%	420	Assoc

Electricians and Installation and Repair occupations related to EV

SOC Code	Occupation	Median, Annual Earnings, 2021	Employment		Percent Change in Employment 2020-2030	Annual Job Openings 2020-2030	Education typically required to enter the occupation
			2020	2030			
47-2111	Electricians	$ 62,810	21,730	24,570	13.1%	2,655	High school
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	$ 73,600	13,250	14,410	8.8%	1,340	High school
49-3023	Automotive Service Technicians and Mechanics	$ 46,450	19,200	19,190	-0.1%	1,875	Certificate
49-9041	Industrial and Machinery Mechanics	$ 56,570	21,240	27,220	28.2%	2,650	High school
49-9071	Maintenance and Repair Workers, General	$ 41,700	40,860	45,490	11.3%	4,505	High school

Production occupations related to EV

SOC Code	Occupation	Median Annual Earnings, 2021	Employment		Percent Change in Employment 2020-2030	Annual job openings, 2020-2030	Education typically required to enter the occupation
			2020	2030			
51-1011	First-Line Supervisors of Production and Operating Workers	66,090	28,400	31,250	10.0%	3,190	HS
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	37,350	10,640	12,010	12.9%	1,315	HS
51-2031	Engine and Other Machine Assemblers	50,550	8,230	7,270	-11.7%	745	HS
51-2090	Miscellaneous Assemblers and Fabricators	40,950	95,750	94,240	-1.6%	10,255	HS

Upjohn methodology to projecting net employment change and annual job openings by occupation

Identifying good-paying / in-demand occupations by typical education and training required for entry

And for occupations related to EV for Michigan and by county

Upjohn model for projecting employment change and annual openings for occupations

- Develop state and county-based projections of industry employment over a 5-year period from 2021 - 2026 using a forecast model
- Use the May 2021 Occupational Employment and Wage Survey (OEWS) database of occupational staffing patterns by industry for Michigan
- Apply the occupational staffing patterns for Michigan industries to the forecast of state and county level industry employment to produce estimates of occupational employment – summing up the estimates across industries

Outputs to be produced

- Occupational staffing patterns and wages by industry in the base year (2021) for occupations and industries related to EV
  - Wages 10th, 25th, 50th, 75th, 90th percentiles
- Education and training generally required to enter each EV related occupation
  - Industry certifications and educational credentials associated with these occupations
- Net employment changes and employment growth by occupation over the forecast period, 2021-2026 (for example)

Outputs to be produced

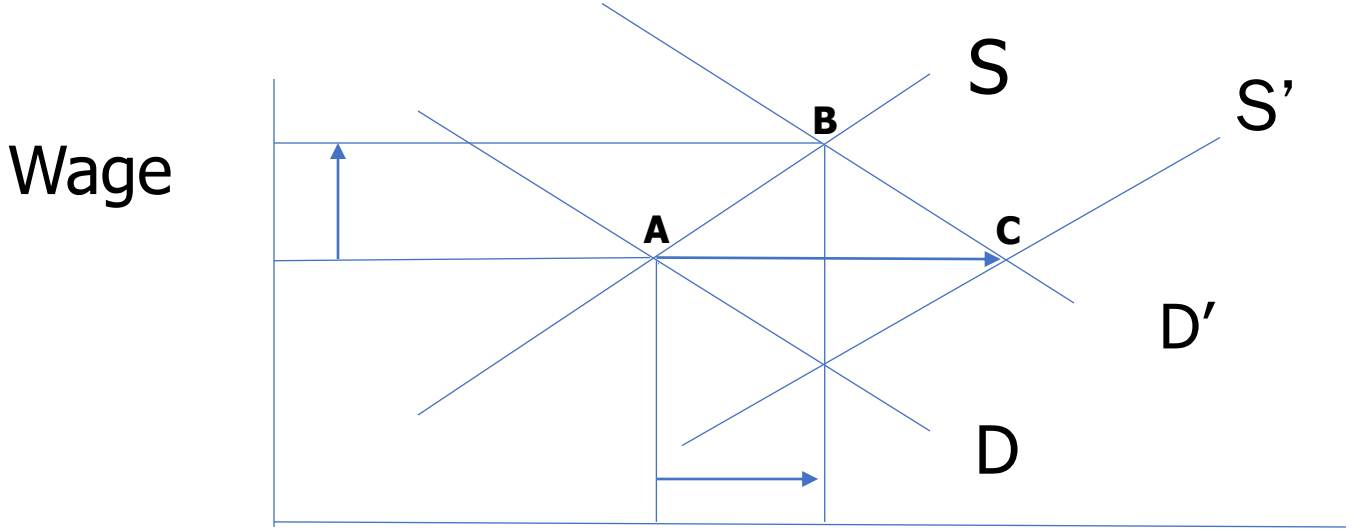
- **Projected number of job openings in an occupation**
  - Job openings can result from both net employment growth (aka, more jobs) and the need to replace workers that retire or otherwise leave an occupation
  - Job openings provide a measure of the full opportunity set faced by individuals to find a job in their chosen occupation

Approach to defining good-paying, in-demand jobs

Employment criteria for in-demand occupations

- For each education category, we focus on strong labor markets in which we observe occupations with **strong employment growth**

- We do not use a wage growth criteria. A growing demand for workers could create a supply response so that observed wages could rise, stay the same or fall



In-Demand

- Over the 2021 - 2031 period, the BLS projections average 7.7 percent employment growth for the US
- Over the 2020-2030 period, the Michigan projections average 8.8 percent employment growth
- Over the 2021 - 2026, the Moody's forecast model averaged 7.4 percent employment growth for Michigan.
- We (currently) propose using 5 percent change as our threshold for high demand / this assumption can be easily modified

In-Demand

- The higher employment projections for the 2020-2030 period for both the BLS national and the Michigan state projections reflect a recovery from the dramatic decline in employment experienced in 2020

- Our assumption of 5 percent for 2021-2026 reflects the strength of employment gains already experienced from 2020 to 2021

Good-paying

- We propose using $41,600 as our annual wage threshold for well-paying occupations
  - Represents a job paying $20 per hour working 40 hours a week and getting paid for 52 weeks a year
  - It is 3.3 times the poverty level of $12,760 for a single individual
  - It is 2.1 times the state mandated minimum wage in Michigan of $9.65 an hour
  - It is 1.8 times the living wage in Michigan ($11.35 an hour)
  - $41,600 exceeds the median annual wage for the nation, Michigan and the Kalamazoo-Portage MSA

Index of demand for CTE courses

Index of demand for CTE courses related to EV occupations

- Use the Classification of Instructional Programs (CIP) crosswalk to the Standard Occupational Classification System to identify occupations related to each CIP course
- Use data on wages, projected employment growth, and annual job openings to create an overall index summarizing the demand for each CTE course
- Bundle these CTE indexes into program areas

Questions?

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