

# HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE OUTLOOK TO 2022

April 2019



# PURPOSE AND BASIS OF WORKFORCE PROJECTIONS

- **The Sector Intelligence Model (SIM) for Heavy Industrial Construction, formerly OILMAP, is a collaboration between the government of Alberta and COAA that has been in place since January 2012.**
  - **The purpose is to provide a better understanding of the heavy industrial construction and maintenance workforce demands in Alberta.**
- **The projections are based on micro-economic modelling that is updated twice a year: Spring (May) and Fall (November).**
- **The forecasts includes brownfield and greenfield projects that have been validated by individual companies. Only projects that have a confirmed start and end date are included in the model.**
- **The forecasts for the ongoing and turnaround maintenance are based on historical data from the General Presidents' Maintenance Committee for Canada and the National Maintenance Council For Canada.**

# HEAVY INDUSTRIAL CONSTRUCTION DEMAND METHODOLOGY

## SECTOR INTELLIGENCE MODEL (SIM)

### 1. Calibration Factors based on past construction projects

- Total Project Workforce Required
  - Type of Projects (e.g. oil sands, petrochemical, pipeline, power)
  - Size of Projects, measured by output capacity (e.g. Bpd, mlbs/day, MW)
- Workforce Breakdown
  - By Trade
  - By Stage of Project

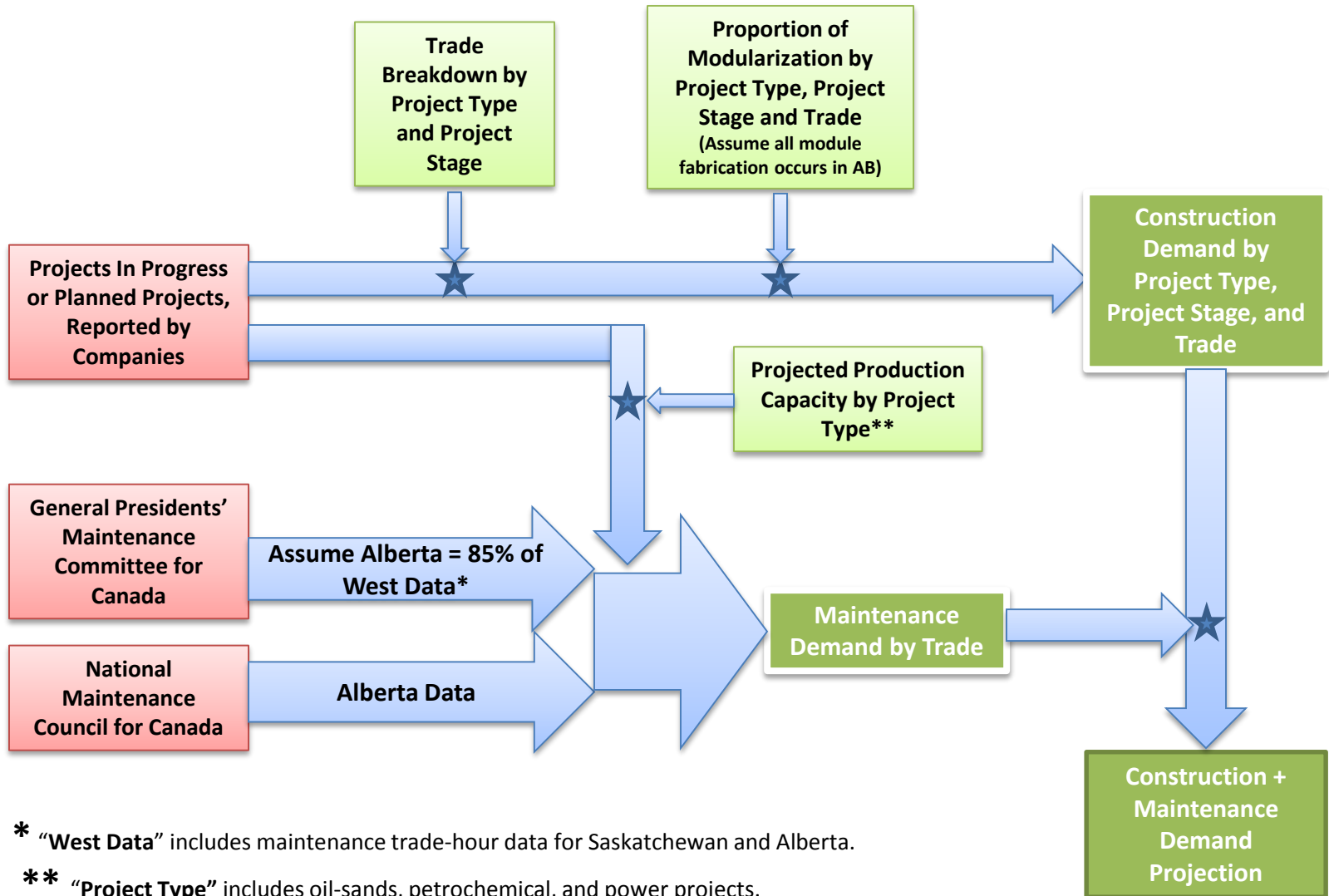
### 2. Forecast of Current and Future Construction Demand

- Identify Future Projects
  - Type (e.g. oil sands, petrochemical, pipeline, power)
  - Size (e.g. Bpd, mlbs/day, MW)
  - Start/End Dates
  - Status (e.g. application for regulatory approval)
- Forecast = Sum of Month by Month Project Demands

### 3. Reasonableness Review by Industry Practitioners

# HEAVY INDUSTRIAL CONSTRUCTION AND MAINTENANCE DEMAND

## METHODOLOGY: SECTOR INTELLIGENCE MODEL (SIM) APPROACH



# SPRING 2019 UPDATE

- **The following reflects updates that were collected from companies between February to April 2019 and includes:**
  - 1) Heavy Industrial Construction Projects:**
    - **On-Site Construction**
      - Oil Sands (Mining, In-situ, Upgrading)
      - Petrochemical
      - Pipeline (Pipelines, Pump-stations, Terminals)
      - Power Generation (Wind, Gas, Solar)
      - Natural Gas Processing and Transmission projects have been counted but are not included in the workforce projection.
    - **Off-Site Module Fabrication**
  - 2) Maintenance Projects**
    - Ongoing maintenance
    - Turn-around maintenance

# PROJECT CATEGORIES

- **There are six categories of projects:**
- **Projects included in the model are:**
  - **Projects that are in “Planning Stage” with or without anticipated start and end date. Also includes projects that have Regulatory Approval but no start/end date.**
  - **Projects that have “Received Regulatory Approval” and plan to proceed with start/end date.**
  - **Projects that are “Construction In-Progress” with start/end date**
  - **Projects that have been “Postponed” but have an anticipated start and end date.**
- **Projects removed from the model:**
  - **On-Hold with no start date identified**
  - **Cancelled – projects have been removed from a companies capital plans**
  - **Completed – projects are completed with no construction staff remaining.**

# UPDATES FOR SPRING 2019

- **In Spring 2019, 63 companies were contacted and a response from 56 was received (89%).**
  - **In comparison, the spring 2018 response rate was 90%.**
- **A total of 337 projects were identified of which 124 are in planning/regulatory approval and 58 are in the construction stage.**
  - **In comparison to 2018 Spring, we identified 348 projects, 162 in planning/regulatory approval and 36 are in the construction stage**
- **In Spring 2019 forecast, 79 projects have been reported as on-hold with no start date, this was eight projects less compared to Spring 2019 forecast.**

# HIGHLIGHTS

- **The Spring 2019 projection suggests that the workforce demand has been stable when comparing to the Spring 2018 forecast. However, the labour demand decreased, compared to 2017 spring forecast.**
  - **This indicates the heavy industrial construction industry may be ending its decline and is entering a more stable position, although at a lower level of activity compared to the previous 10 years.**
  - **The project reflects the results from the Spring 2018 forecast - labour demand dropping in 2019 with a slow upswing in 2020. This is primarily due to 2 large projects that were completed last year.**
  - **A significant number of projects in construction have been identified to be the Natural Gas Processing sub-sector (7 projects) , however, currently there is no model to calculate labour demand and these projects are not included in the labour forecast. In addition, there are a few large transmission projects in planning and construction stage that are not included in the model.**
    - **There was also a significant amount of pipeline and well tie-in work reported, but not included as there is no model.**



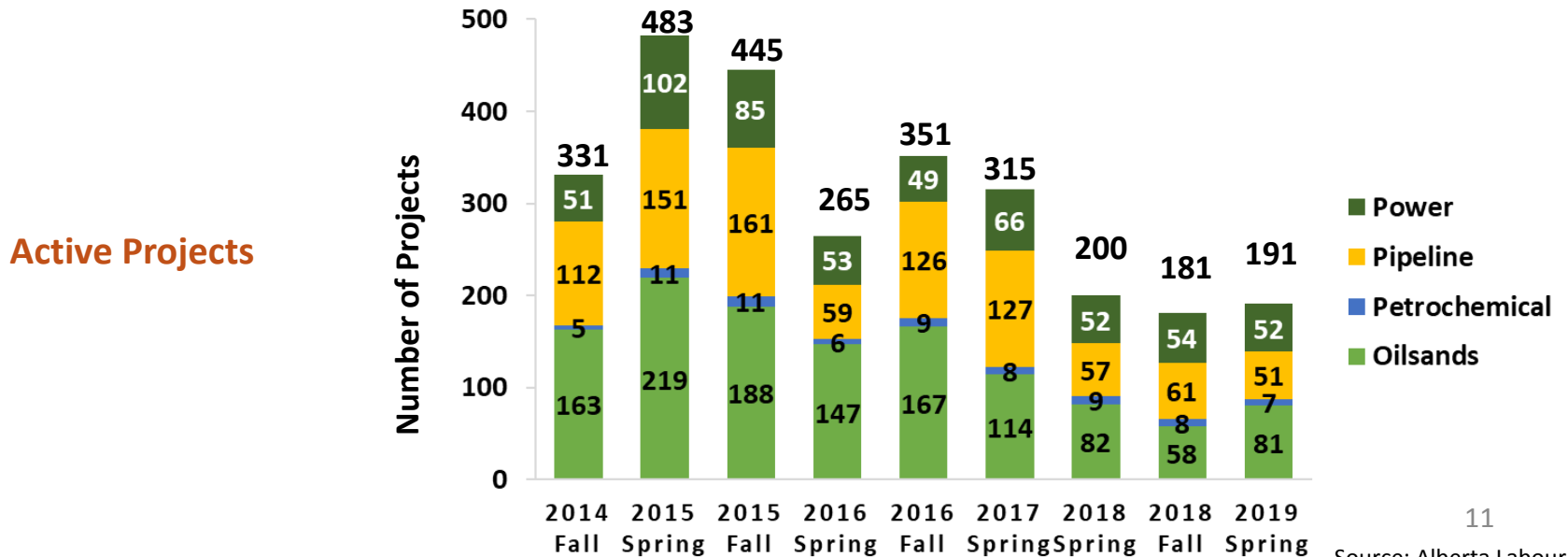
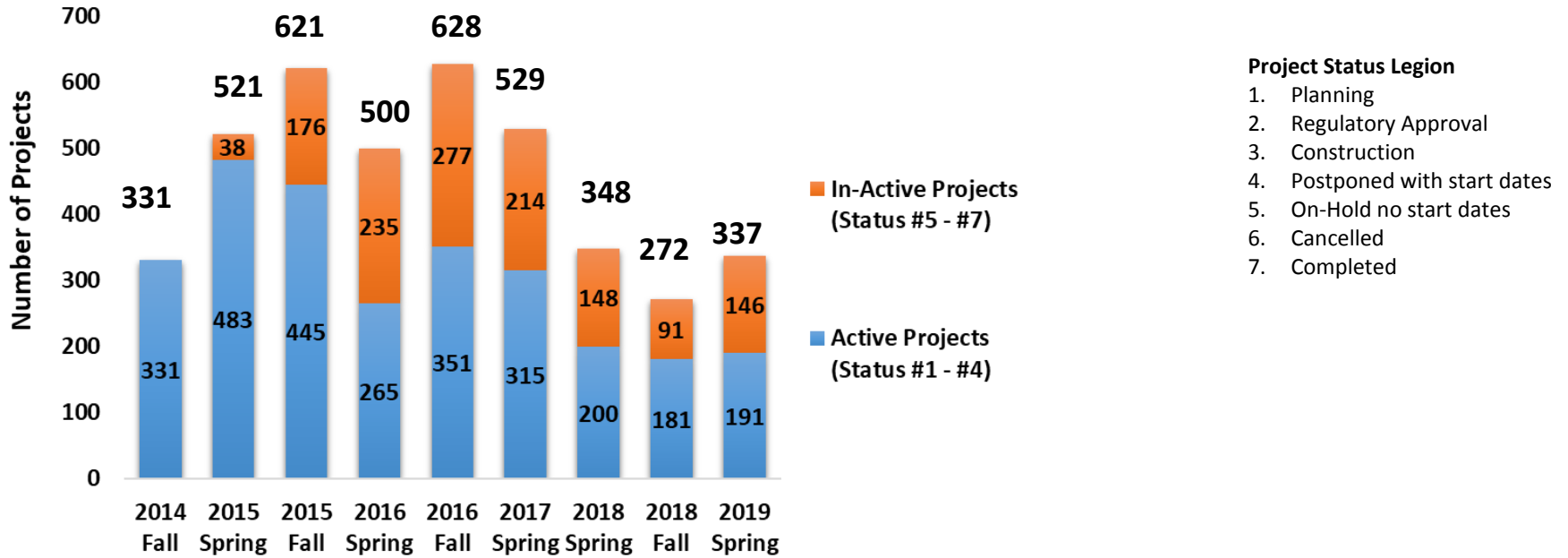
# HIGHLIGHTS

- Labour demand is projected to go up from mid-2019 to mid-2021, however, the 2019-2021 numbers are still considered soft as a number of projects under development may not proceed. The peak employment is predicted to reach over 41 thousands workers by May 2020.
- The off-site modular work has shifted due to the identification of 2 large projects that will proceed as well as a number of in-situ projects that have been put on hold
  - The sharp drop in mid-2021 is due to the expected completion of an upgrader project in 2022.
- Ongoing maintenance is a stabilizing influence on construction trades since existing facilities are getting older and new facilities are coming into production.
- The model currently forecasts maintenance schedules based on current and historic capacity data. There may be some discrepancy with actual requirements as companies evaluate maintenance plans going forward and may not follow their traditional schedules.
- The top 5 occupations with the highest demand remain the same as the last update and include boilermakers, pipefitters, labourers, carpenters and electricians. As the model does not incorporate labour supply the actual tightness of specific trades may not align.

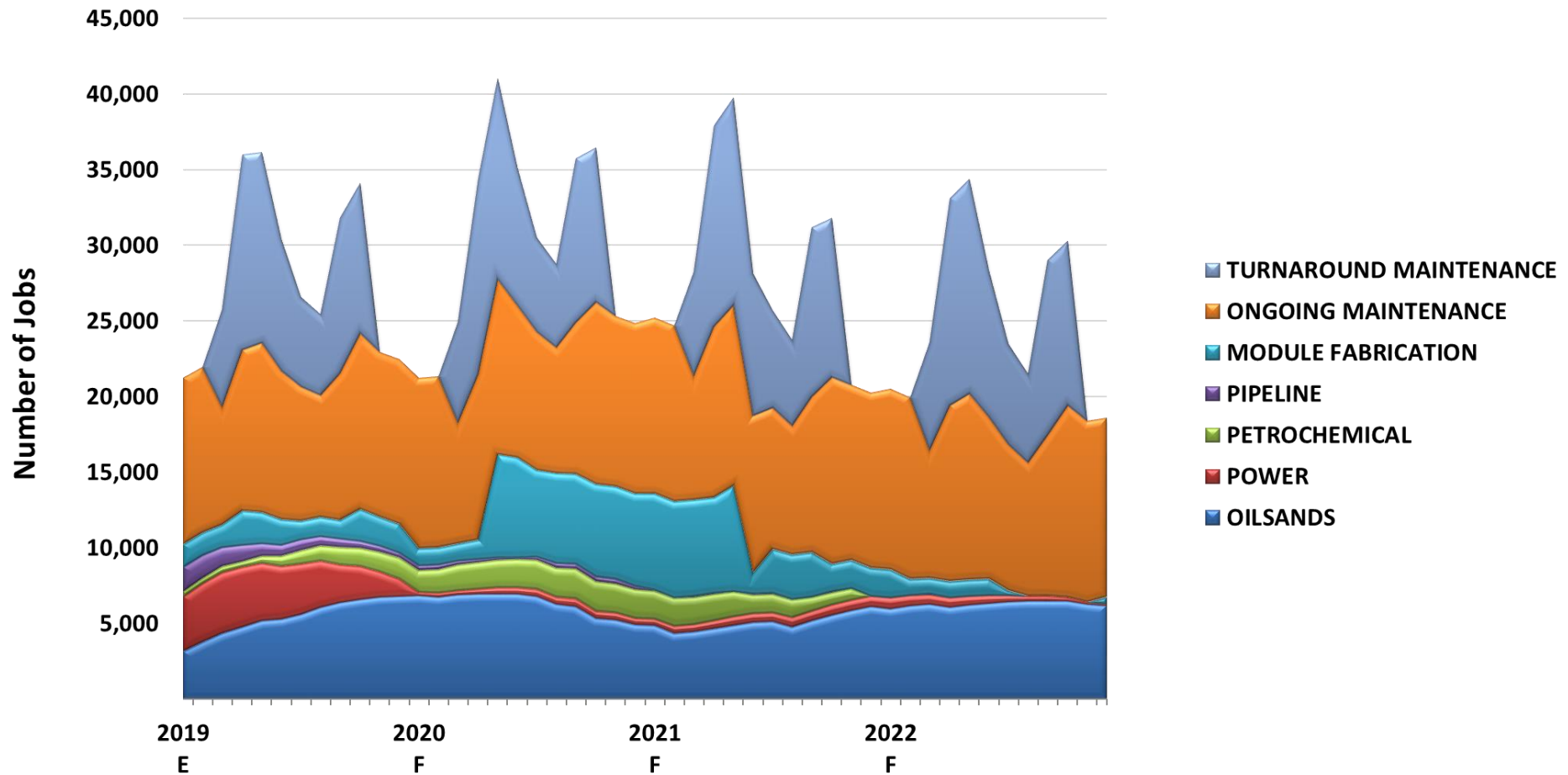
# TOTAL PROJECT COUNT – SPRING 2019 UPDATE

Sr.	Status	Mining	In-situ	Upgrading	Natural Gas Processing	Petrochemical	Pipelines	Pump-Stations	Terminals	Wind Power	Gas Power	Solar Power-Hydro Power	Transmission	TOTAL
1	Planning Stage	6	39	2	1	2	10	5	1	13	7	6	5	97
2	Received Regulatory Approval and Plan to Proceed	0	9	2	0	1	3	3	1	2	5	0	1	27
3	Construction In-Progress	0	9	3	6	4	9	17	2	1	6	0	1	58
4	Postponed (provide anticipated start and end date)	1	2	1	0	0	0	0	0	2	3	0	0	9
5	On-Hold (cannot identify the start and end date)	0	47	3	0	1	4	4	3	3	13	1	0	79
6	Cancelled (completely no plan to proceed)	1	3	0	1	1	7	12	1	3	3	0	1	33
7	Completed (Construction done and ready to start production)	0	3	0	3	7	6	9	3	1	2	0	0	34
<b>TOTAL</b>		<b>8</b>	<b>112</b>	<b>11</b>	<b>11</b>	<b>16</b>	<b>39</b>	<b>50</b>	<b>11</b>	<b>25</b>	<b>39</b>	<b>7</b>	<b>8</b>	<b>337</b>

# TOTAL PROJECT COUNT – SPRING 2019 UPDATE

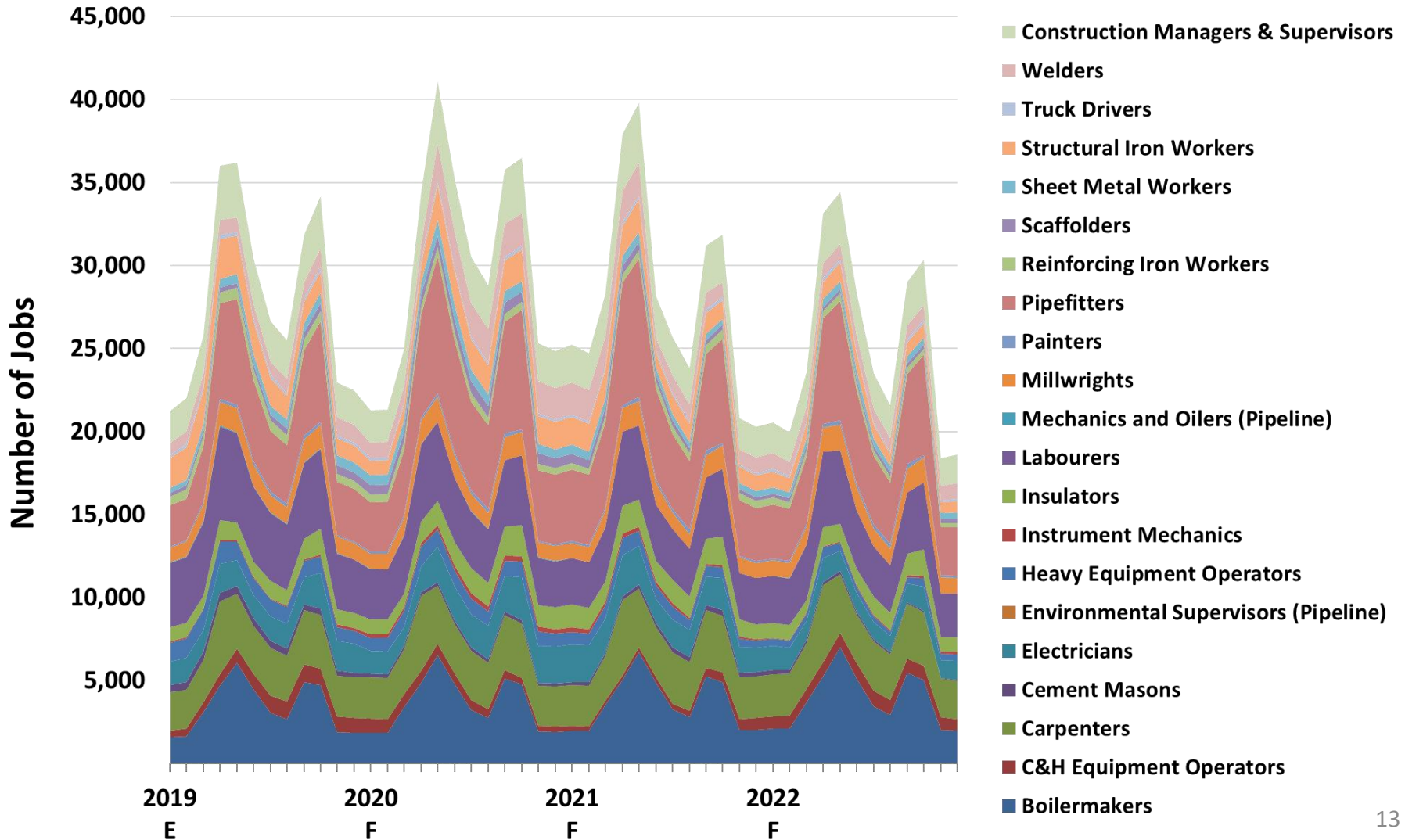


# TOTAL HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022 – BY SECTOR (SPRING)



Note: Number of jobs = number full time jobs (50 hours/week)

# TOTAL HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)



# TOTAL HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)

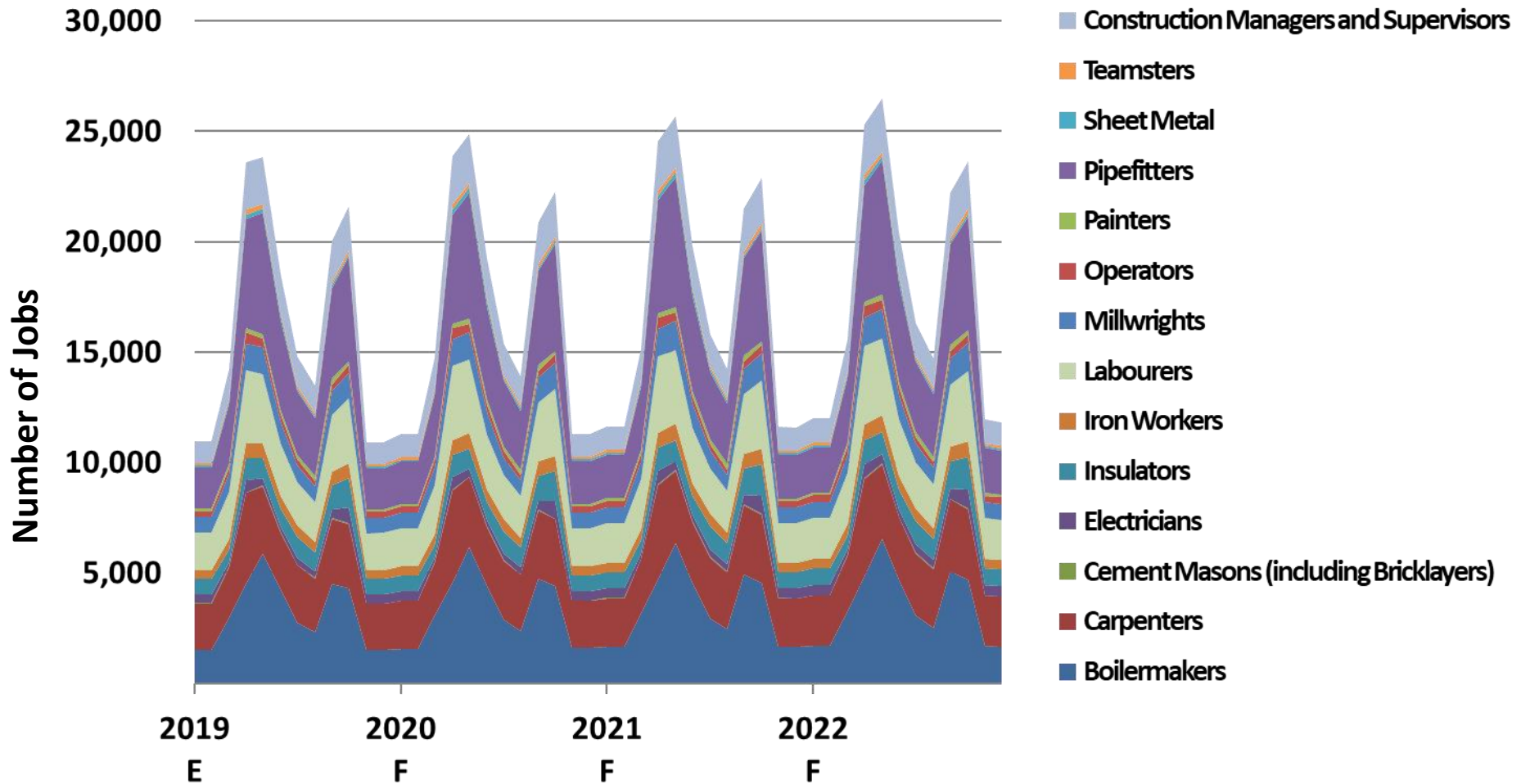
Occupation	2019		2020		2021		2022	
	min	max	min	max	min	max	min	max
Boilermakers	1,605	6,057	1,856	6,520	1,959	6,715	1,974	6,984
C&H Equipment Operators	363	1,075	322	846	259	711	705	920
Carpenters	2,309	4,367	2,392	4,512	2,464	4,564	2,307	4,615
Cement Masons	267	519	178	223	190	330	50	264
Electricians	1,266	2,166	1,146	2,573	1,427	2,458	990	1,478
Heavy Equipment Operators	798	1,348	767	1,166	466	1,029	276	633
Instrument Mechanics	48	169	195	325	71	288	45	165
Insulators	756	1,533	822	1,931	886	1,710	757	1,575
Labourers	3,188	5,630	2,787	4,739	2,737	4,490	2,604	4,547
Mechanics and Oilers (Pipeline)	27	81	5	32	1	2	0	2
Millwrights	843	1,484	886	1,508	870	1,472	930	1,554
Painters	104	269	107	281	115	296	113	304
Pipefitters	2,474	6,354	2,984	8,223	3,176	8,342	2,866	7,194
Reinforcing Iron Workers	473	665	383	564	378	522	257	467
Scaffolders	212	528	541	724	226	563	217	263
Sheet Metal Workers	326	653	539	921	347	623	346	562
Structural Iron Workers	1,008	2,386	858	2,123	860	1,968	633	1,084
Truck Drivers	156	279	150	261	129	231	124	236
Welders	713	1,123	940	2,267	716	1,987	810	971
Construction Managers & Supervisors	1,942	3,291	1,937	3,734	1,842	3,617	1,672	3,127
<b>TOTAL</b>	<b>21,237</b>	<b>36,178</b>	<b>21,249</b>	<b>41,066</b>	<b>20,266</b>	<b>39,782</b>	<b>18,395</b>	<b>34,399</b>

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*Note: Due to rounding, numbers may not add up to the totals.*

# TOTAL MAINTENANCE WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)

*Note: Total maintenance = ongoing maintenance + turnaround maintenance*





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*Note: Total maintenance = ongoing maintenance + turnaround maintenance*

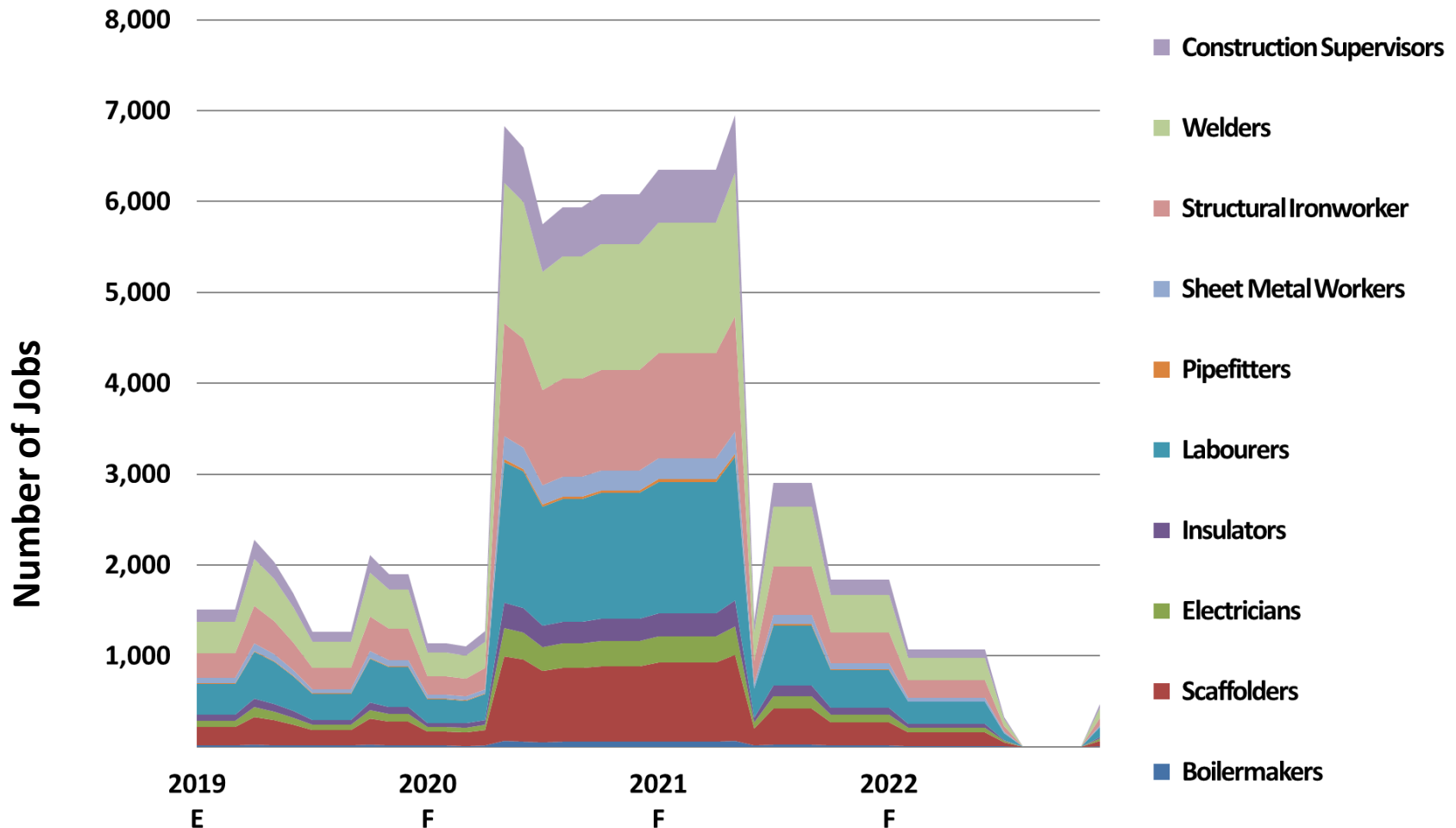
Occupation	2019		2020		2021		2022	
	min	max	min	max	min	max	min	max
Boilermakers	1,509	5,869	1,559	6,144	1,620	6,351	1,665	6,559
Carpenters	2,083	4,105	2,153	4,192	2,215	4,305	2,258	4,435
Cement Masons	14	40	14	42	14	43	14	45
Electricians	194	737	203	772	232	814	250	848
Insulators	580	1,344	596	1,396	619	1,443	641	1,491
Iron Workers	404	691	413	716	422	734	425	756
Labourers	1,685	3,360	1,734	3,399	1,777	3,485	1,793	3,588
Millwrights	682	1,215	701	1,260	720	1,296	729	1,336
Operators	213	527	220	533	225	548	232	565
Painters	103	264	106	276	109	284	110	293
Pipefitters	1,874	5,477	1,934	5,707	1,988	5,892	2,021	6,082
Sheet Metal	69	235	71	249	73	254	74	262
Teamsters	120	219	130	232	125	228	124	233
Construction Managers & Supervisors	992	2,168	1,025	2,263	1,054	2,334	1,075	2,408
<b>TOTAL</b>	<b>10,908</b>	<b>23,846</b>	<b>11,272</b>	<b>24,891</b>	<b>11,591</b>	<b>25,674</b>	<b>11,821</b>	<b>26,492</b>

*Note: Due to rounding, numbers may not add up to the totals.*



# MODULARIZATION WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)

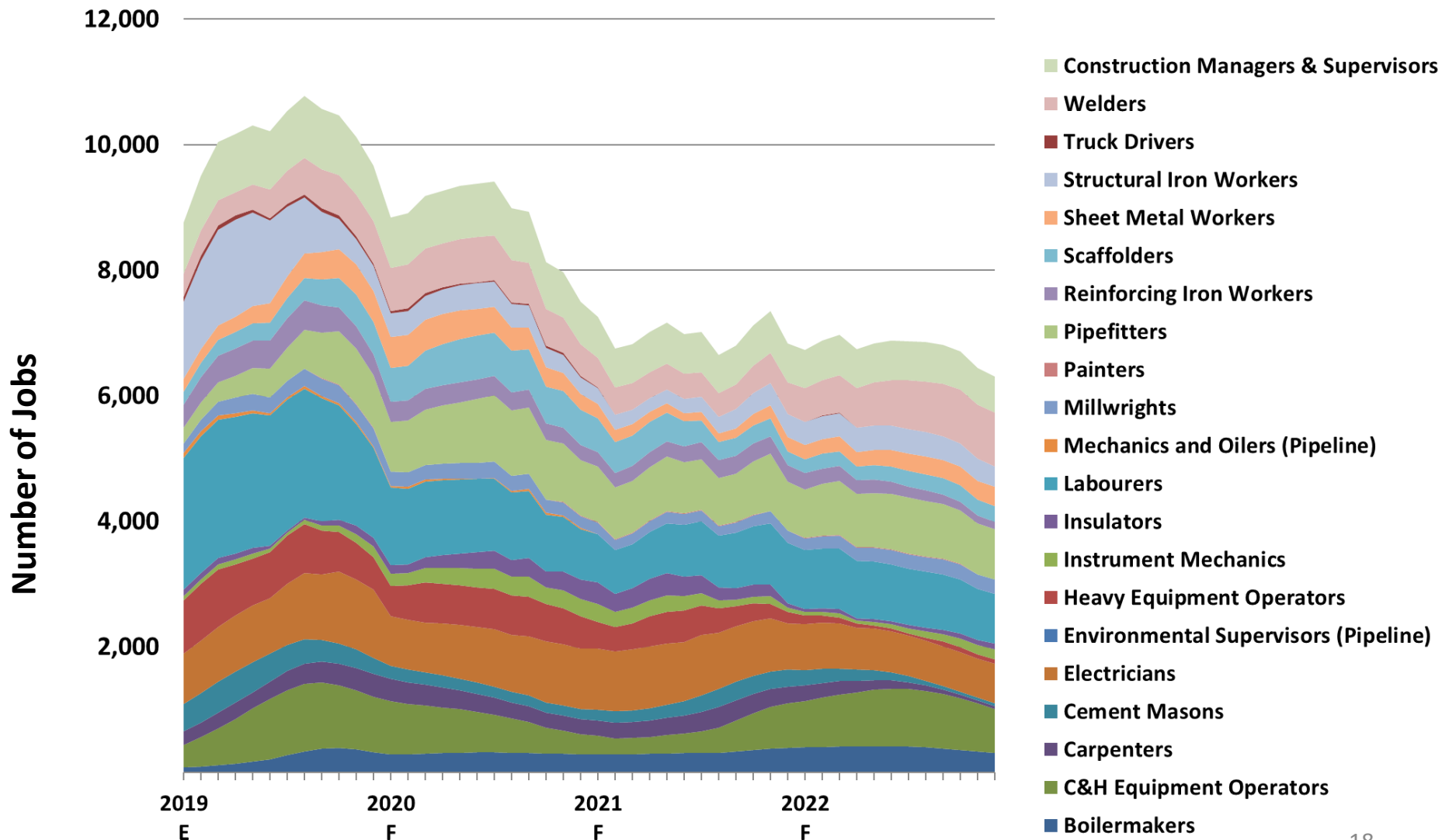
*Note: Module Fabrication includes Insitu, Mining, Upgrading, Petrochemical*



# CONSTRUCTION WORKFORCE REQUIREMENT TO 2022

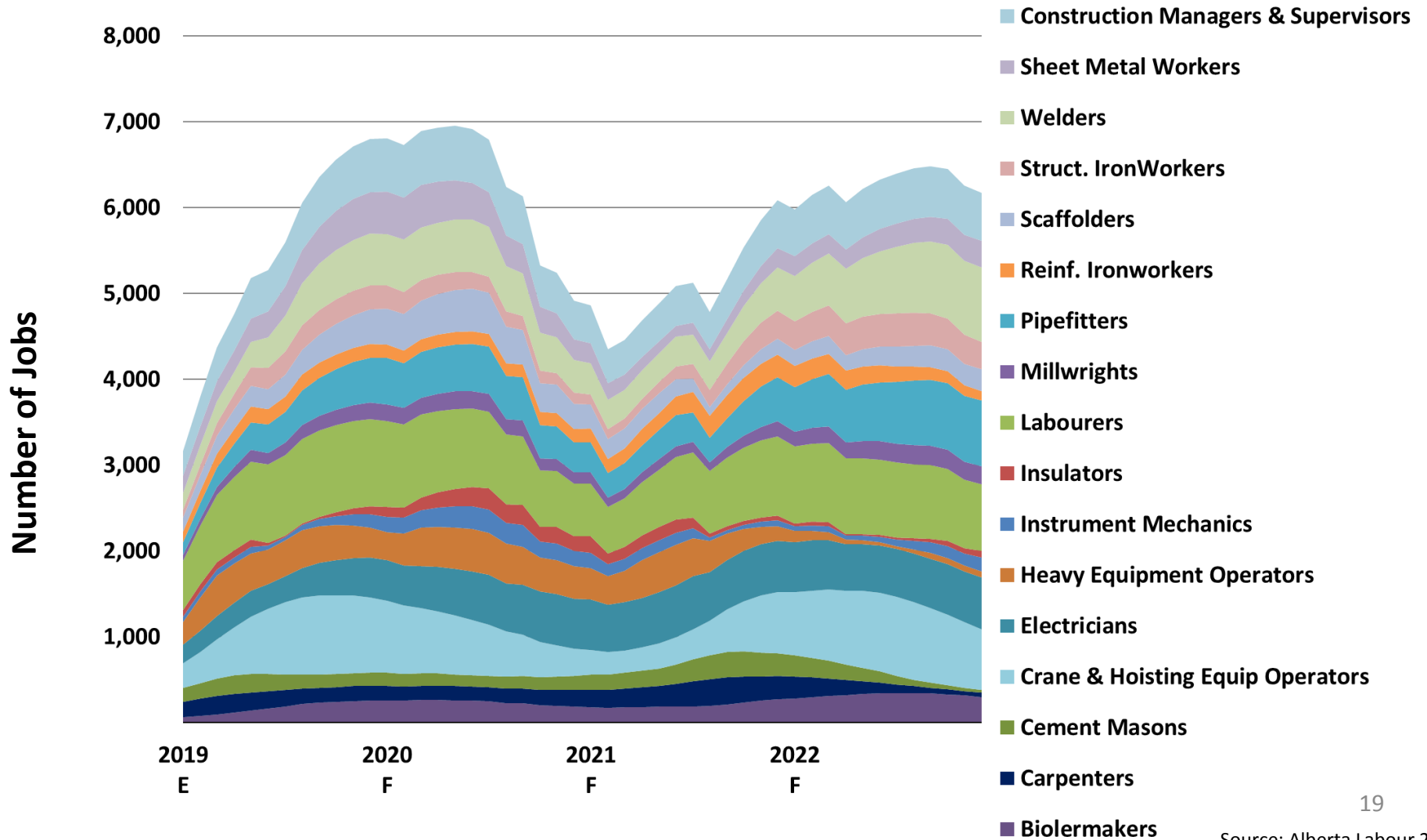
## – BY OCCUPATION (SPRING)

*Note: Construction includes Oilsands, Petrochemical, Power, Pipelines*

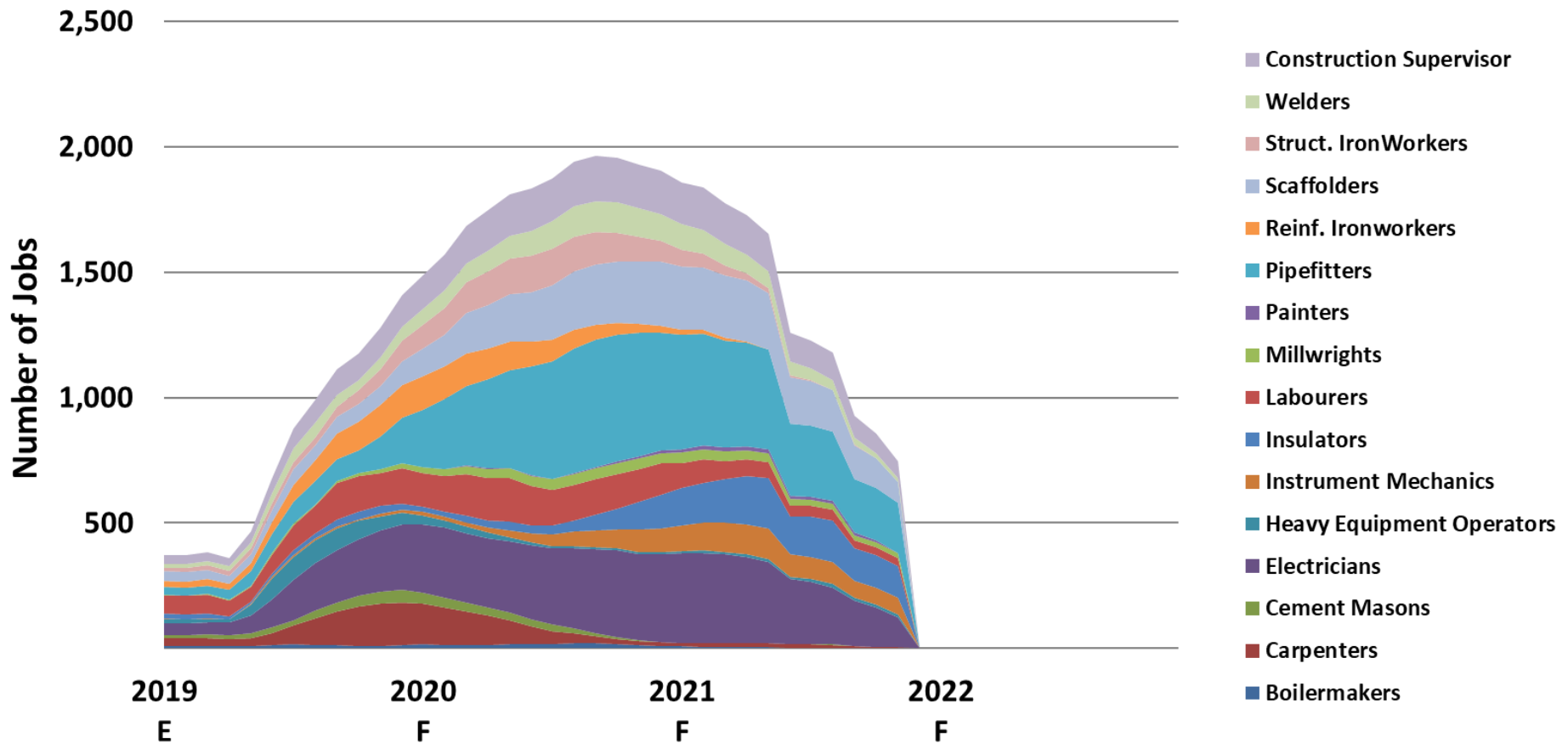


# OILSANDS WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)

*Note: Oilsands includes Insitu, Mining, Upgrading*

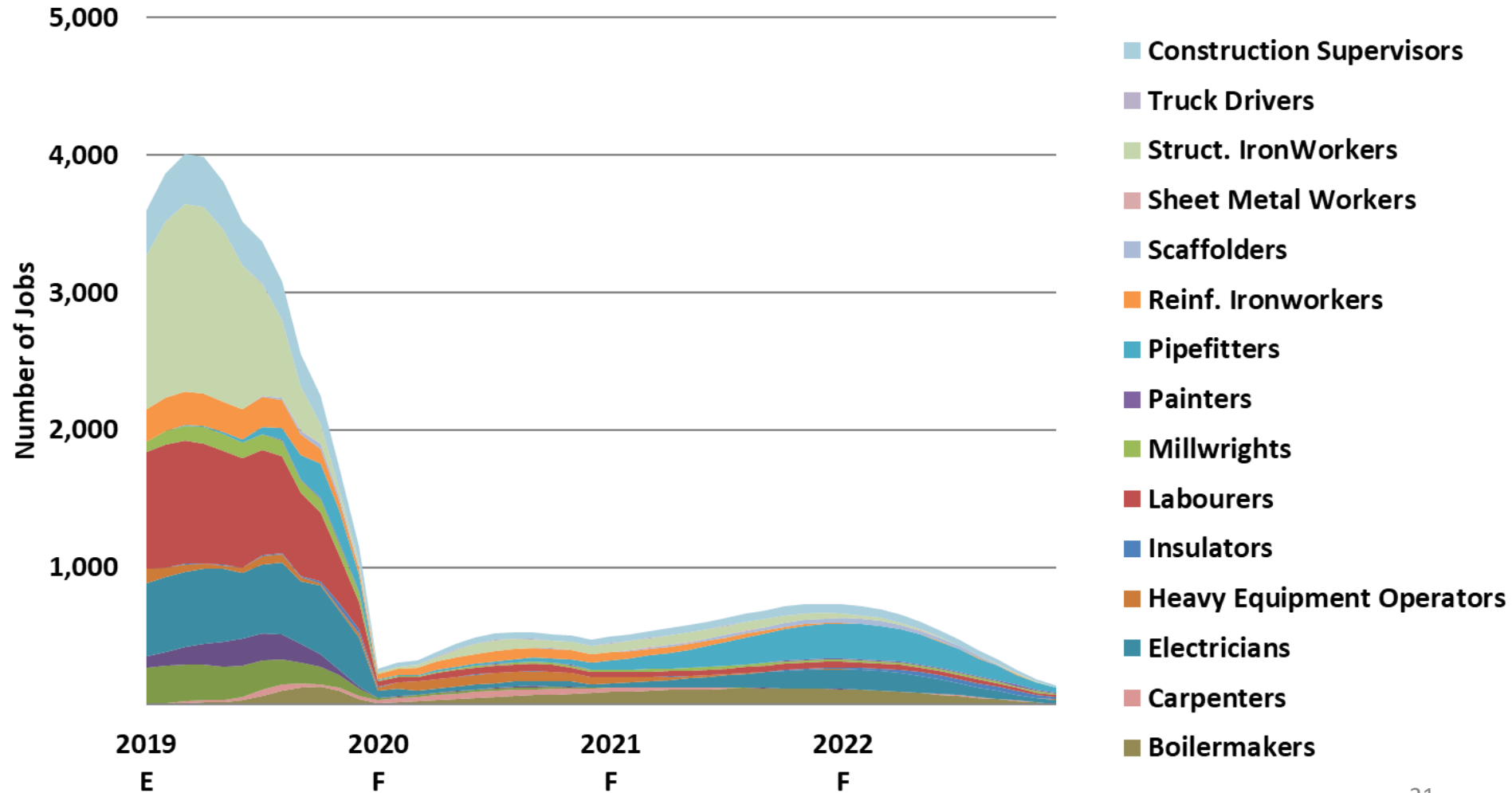


# PETROCHEMICAL WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)



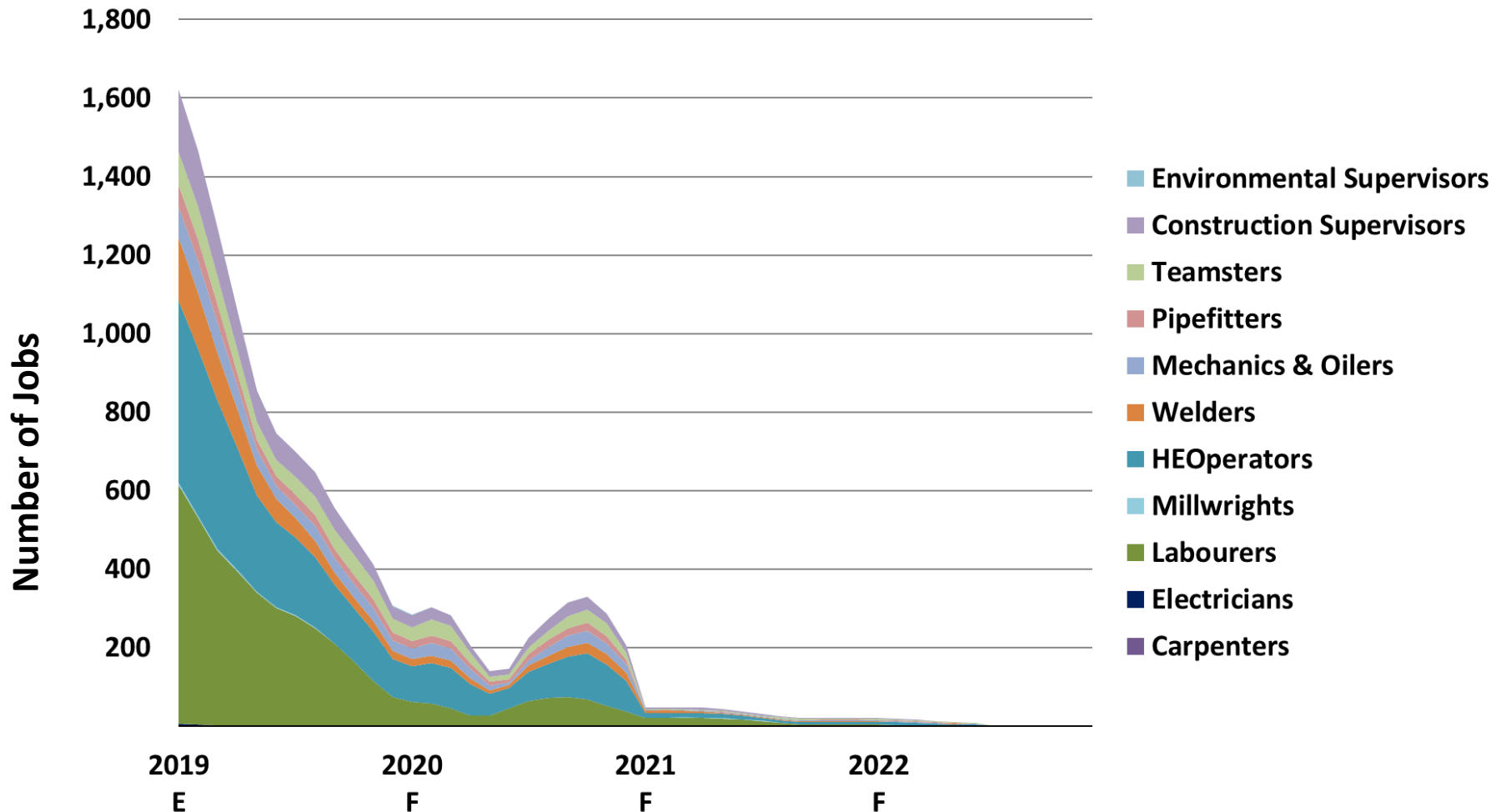
# POWER WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)

*Note: Power includes Natural Gas, Wind Power, Solar Power*

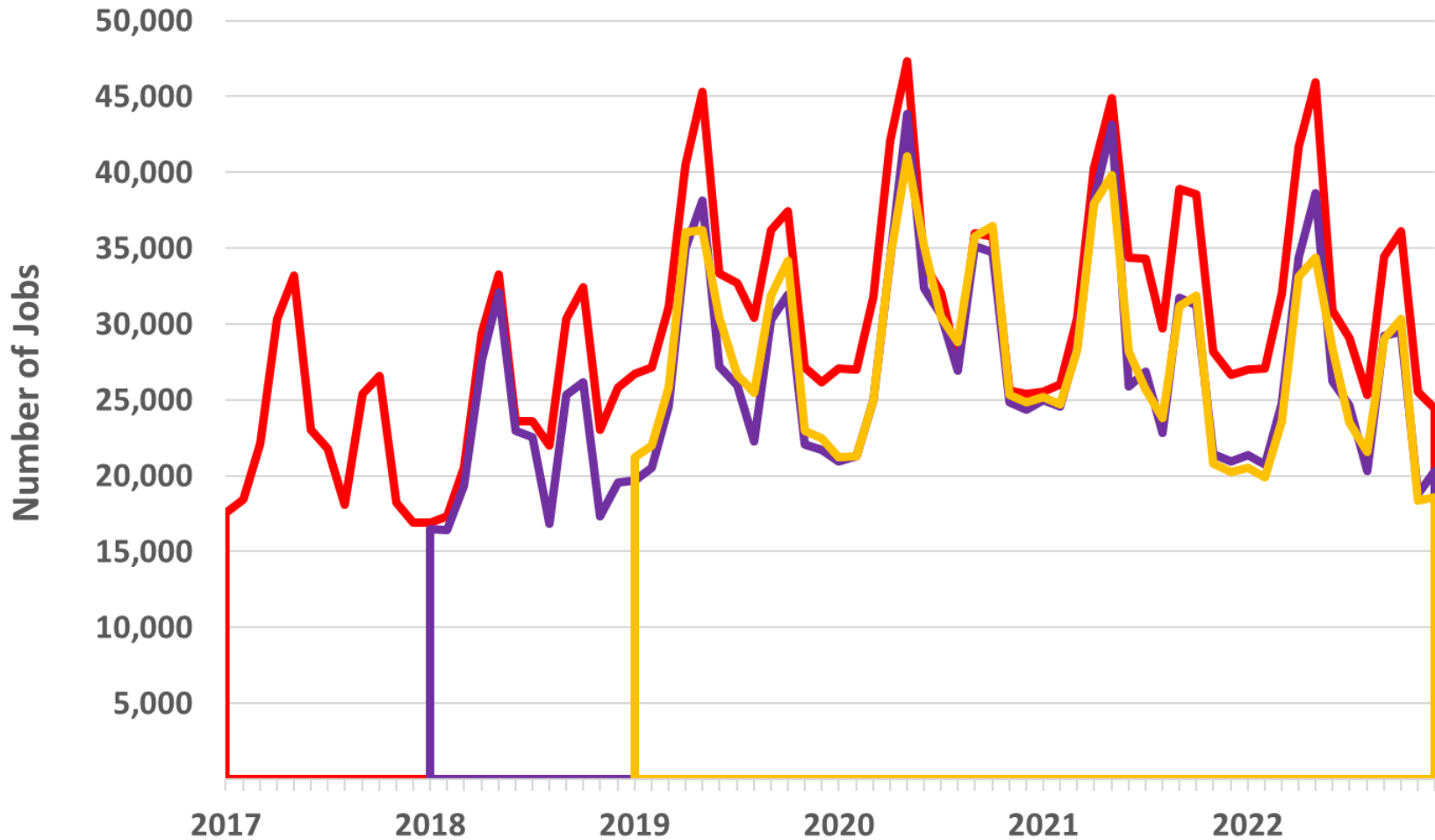


# PIPELINE WORKFORCE REQUIREMENT TO 2022 – BY OCCUPATION (SPRING)

*Note: Pipeline includes Pipelines, Pump Stations, Terminals*

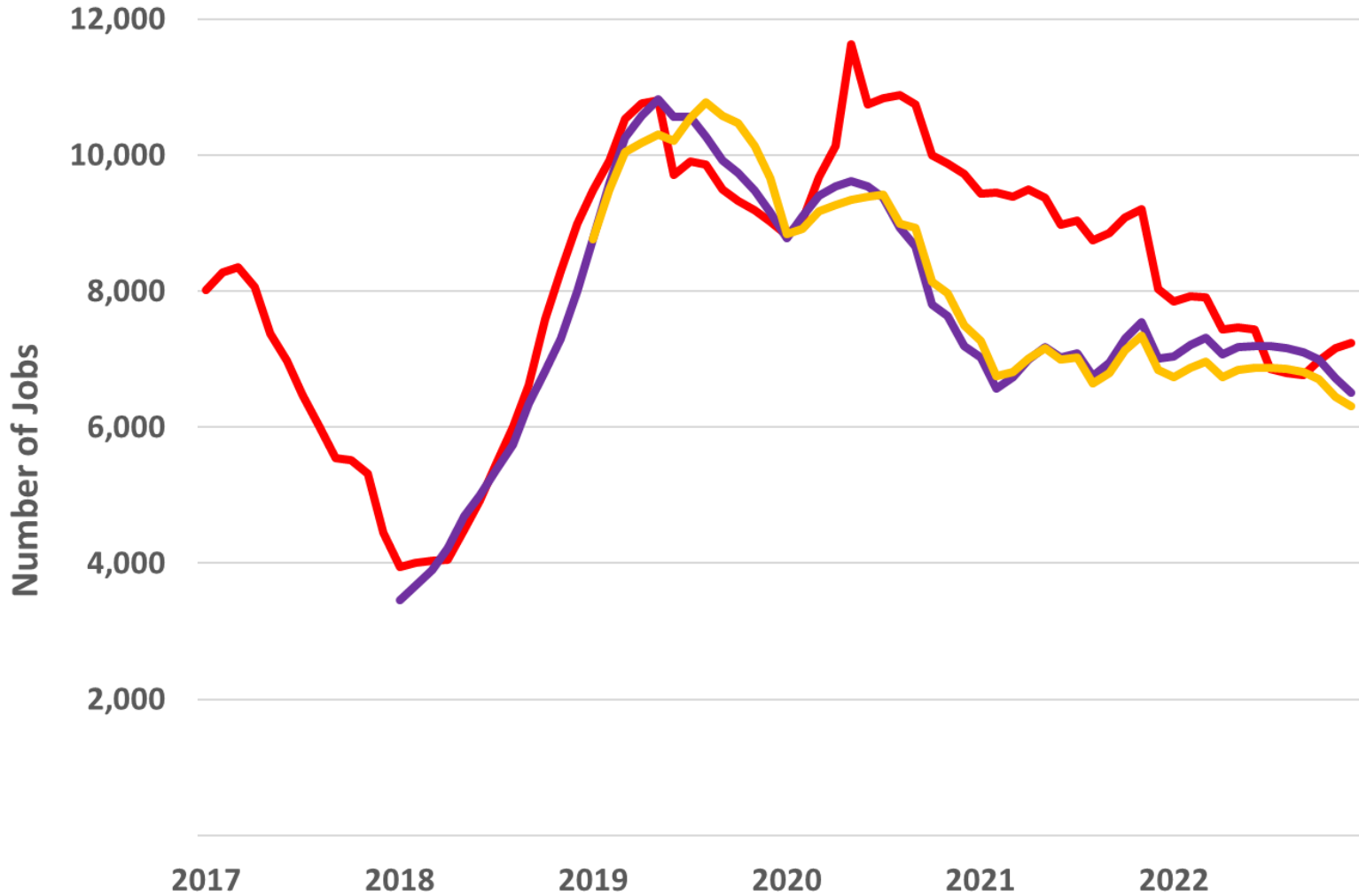


# HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022 – TOTAL (SPRING)



■ 2017 Spring Projection   
 ■ 2018 Spring Projection   
 ■ 2019 Spring Projections

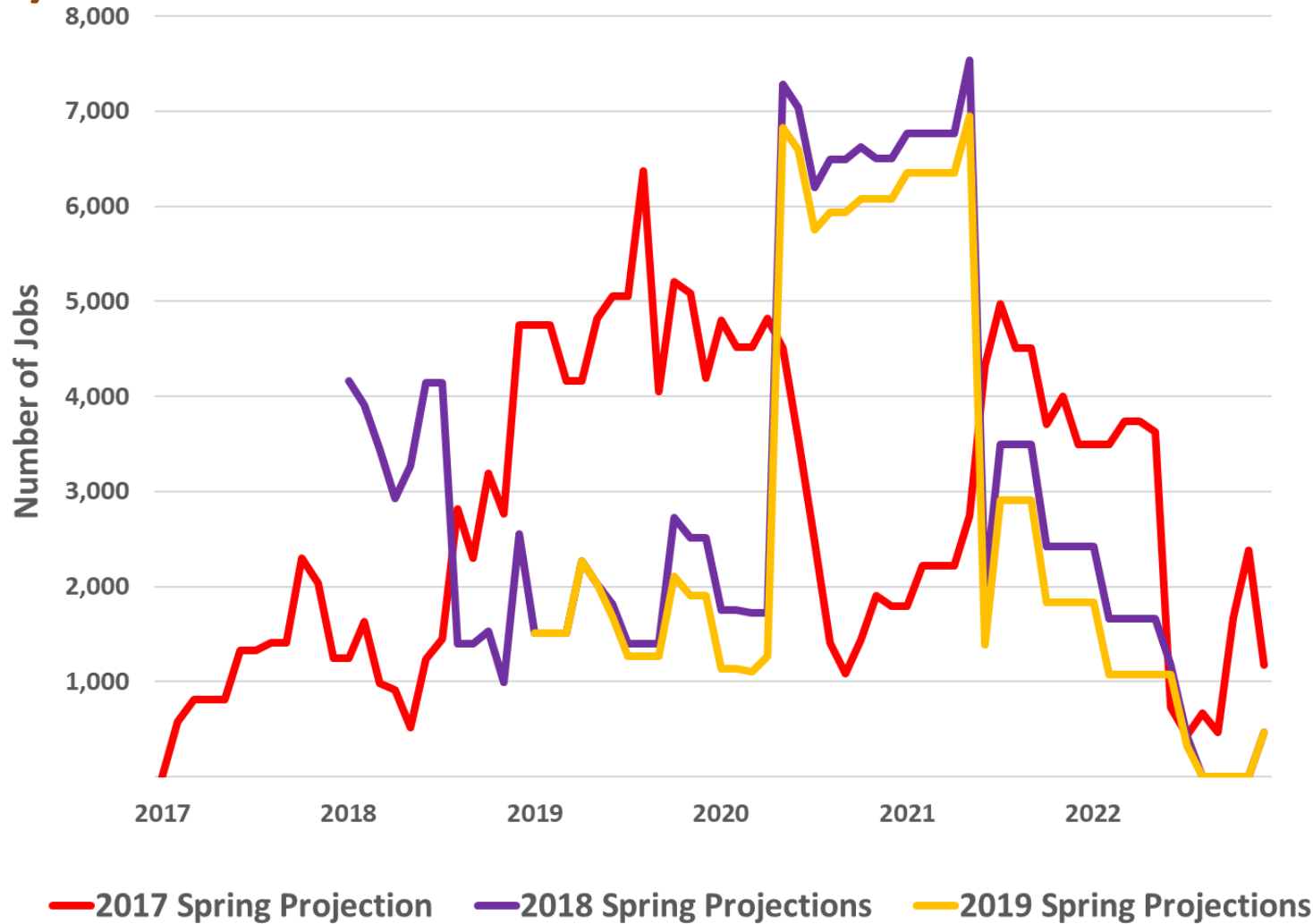
# HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022 – ON-SITE CONSTRUCTION (SPRING)



— 2017 Spring Projection — 2018 Spring Projections — 2019 Spring Projections

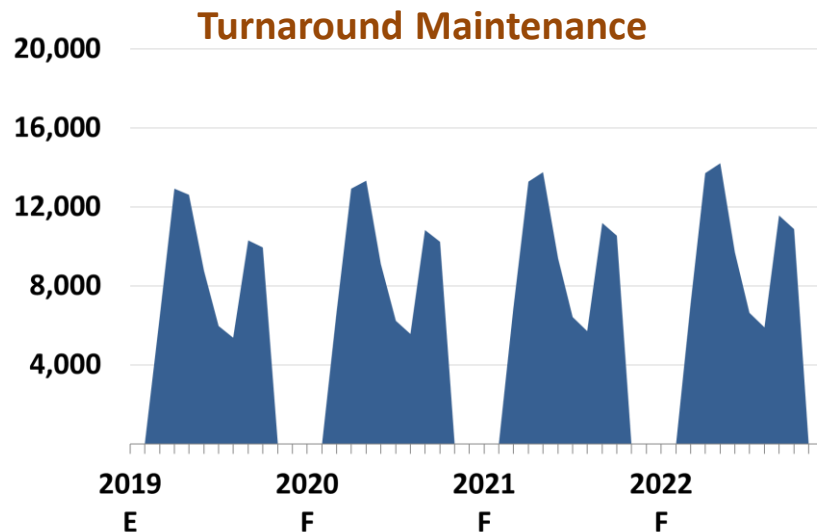
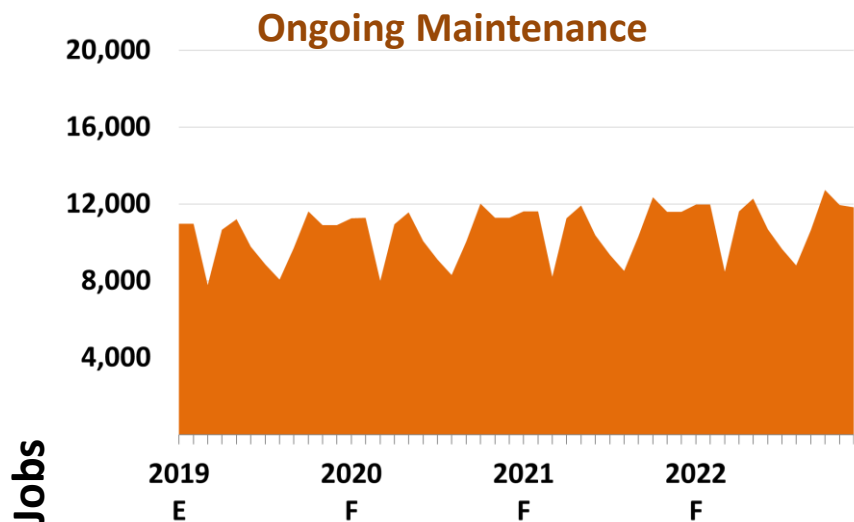


# HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022 – OFF-SITE MODULE CONSTRUCTION (SPRING)

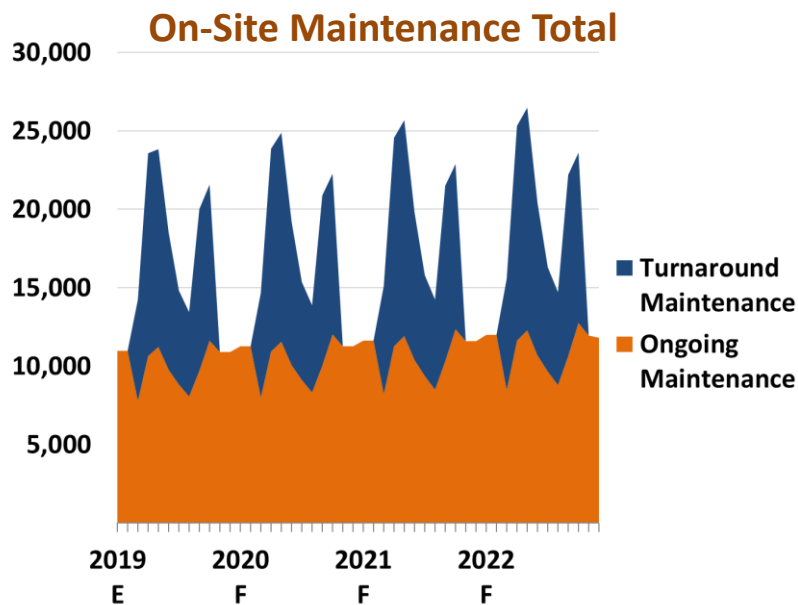


Note: The model assumes that all module fabrication is completed in Alberta

# HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022 – MAINTENANCE (SPRING)



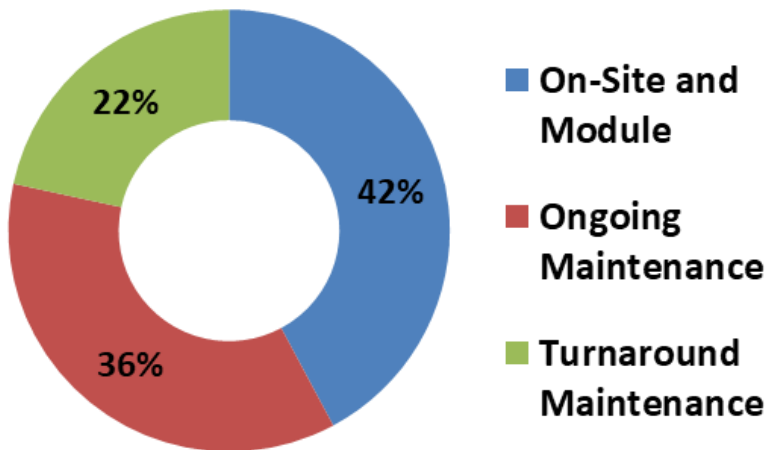
Number of Jobs



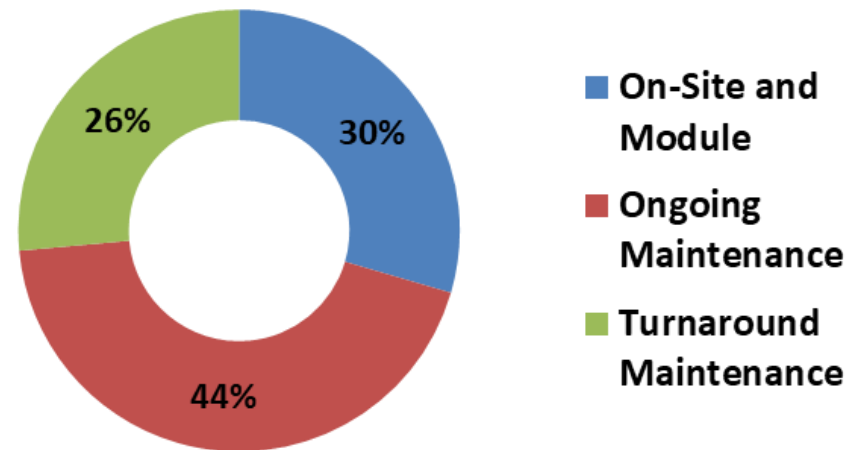
# HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE REQUIREMENT TO 2022- BY TYPE OF PROJECT (SPRING)

Distribution of Workforce Requirement by Type of Project

2019

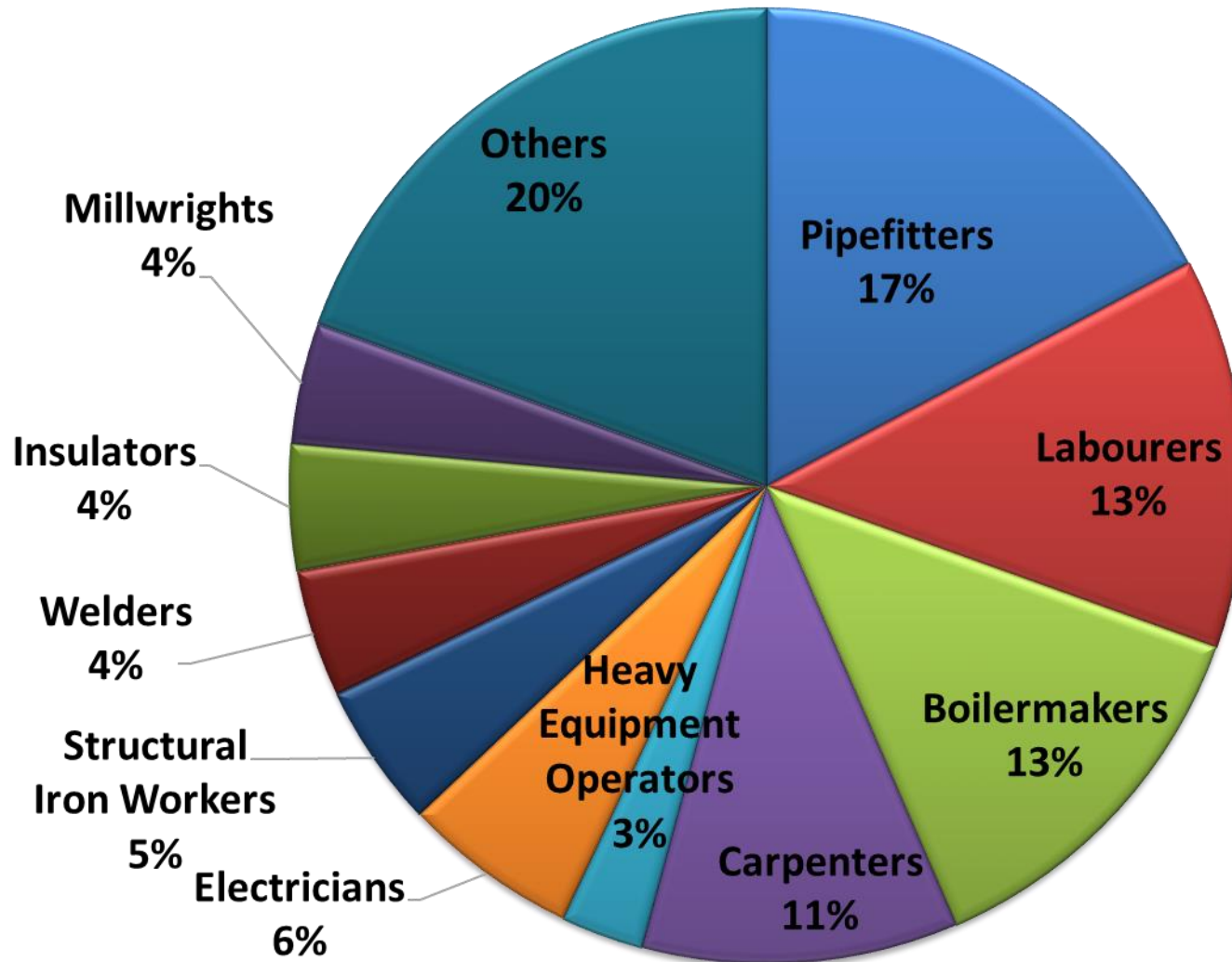


2022



# HEAVY INDUSTRIAL CONSTRUCTION WORKFORCE

## REQUIREMENT TO 2022- DISTRIBUTION BY OCCUPATION (2019-2022) SPRING



# NEXT FORECAST UPDATE

- The next forecast will be completed in Fall 2019.
- Data gathering will take place from September to October with the target to complete the forecast by November 2019.
- As tested last year, GOA established an on-line data collection tool for this survey to streamline the process.
- Employers will still have the ability to update their project information in an easier, more efficient and secure environment.
- For all employers that have registered, GOA will be sending an email requesting companies review their projects and submit.
- Companies that have not registered will be contacted by a GoA representative.