



**Presentation to the Coalition for Chemical Innovation (“CCI”)**

# **Economic and Societal Impacts of EPA’s Implementation of Section 5 of the Lautenberg Chemical Safety Act**

Context, Methodology and Approach, Survey  
Results, and Findings

## Important Information About This Analysis

*This Analysis has been developed by FTI and funded by members of the Coalition for Chemical Innovation.*

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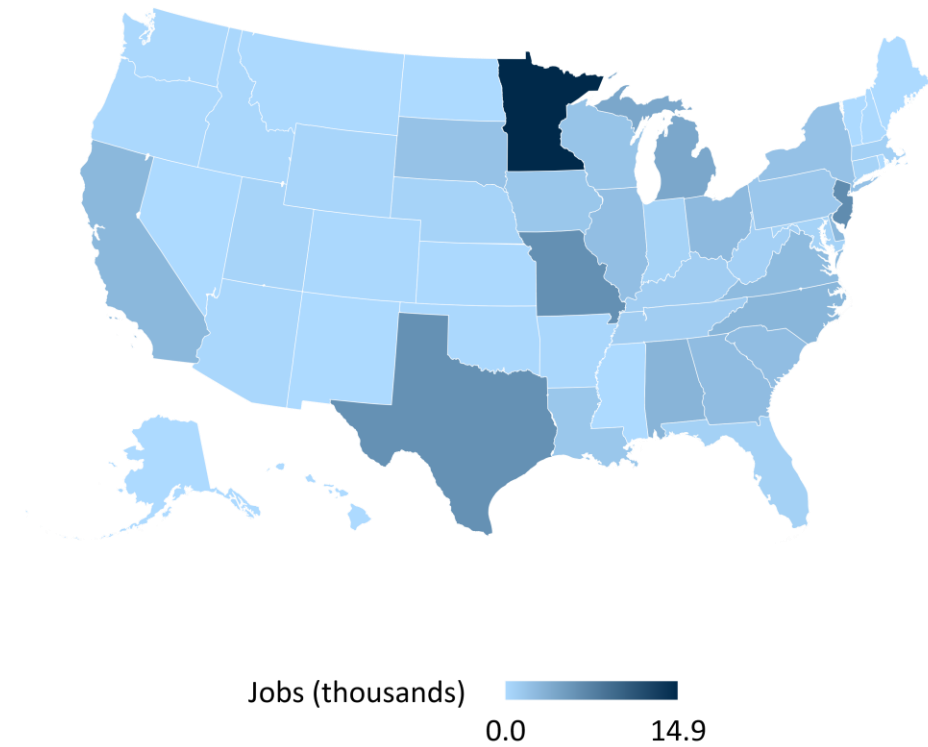
*All survey data evaluated in this Analysis was submitted by May 18<sup>th</sup>, 2022.*

*All EPA data evaluated in this Analysis was accessed as of July 20<sup>th</sup>, 2022.*

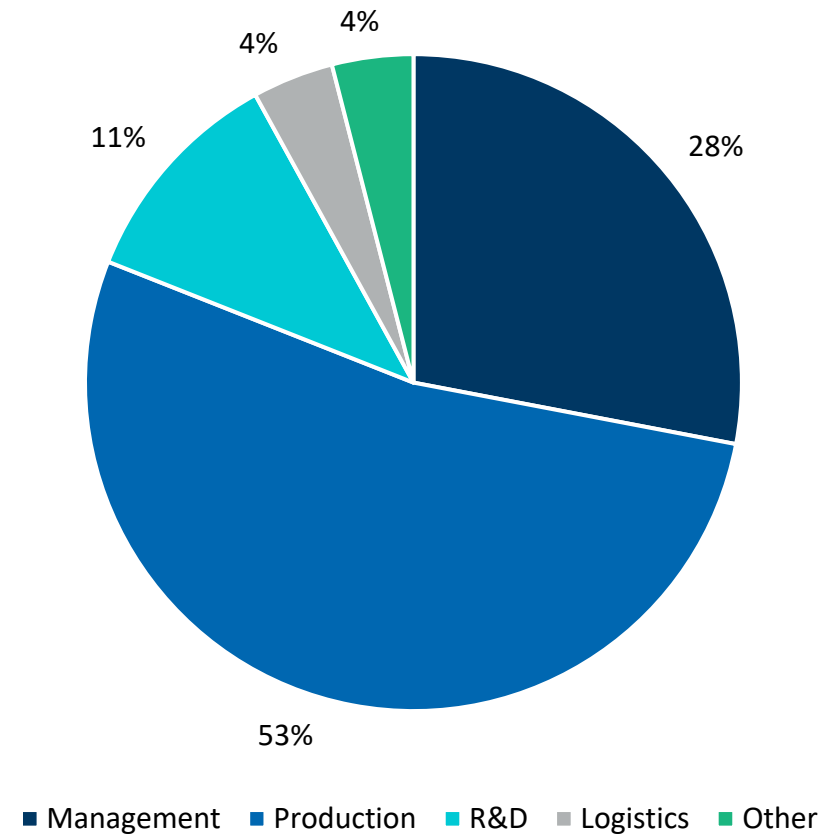
# Coalition for Chemical Innovation

CCI membership encompasses a significant portion of the U.S. chemical sector. In 2021, CCI members directly employed over 84,000 U.S. workers and operated more than 580 locations nationwide.

### CCI Employment Geography (thousands)



### CCI Employment Categories



## Economic Benefits of CCI Members' New Chemical Activities in the U.S.

In 2021, CCI members' new chemical activities generated \$4.0 billion in sales in the U.S., supporting 32,500 jobs, \$12.7 billion in economic output, and \$4.7 billion in GDP economy-wide.

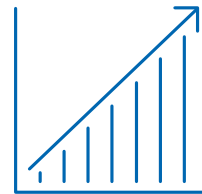
### Economic Impacts



**\$12.7 billion**  
Economic output



**32,500**  
Employed across the U.S.

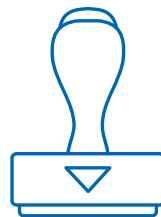


**\$4.7 billion**  
U.S. GDP

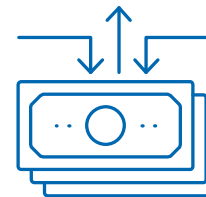


**\$2.5 billion**  
Labor income

### Fiscal Impacts



**\$550 million**  
Federal tax revenues



**\$380 million**  
State and local tax revenues

# Impact of EPA's implementation of Section 5 of the Lautenberg Chemical Safety Act ("the Act")

**For CCI members, the implementation of the Act has resulted in reduced determinations, increased review times, higher costs to submitters, and decreased R&D.**

- Final determinations for member premanufacture notices (PMN) have dropped significantly since the passage of the Act:
  - **In 2021, only five chemicals received a final determination, down from 70 in 2011. 12 chemicals are still under review.**
  - PMN final determinations dropped to only six chemicals for those submitted in 2019.
- The average review time of PMNs by the EPA **in the five years before the Act was 158 days. Since 2016, the average review time of a PMN has increased to 413 days.**
- The average low-volume exceptions (LVE) review time **in the five years before the Act was 44 days. Since 2016, the average review time has been 87 days. In 2021, the average review time was 195 days.**
- CCI members have historically spent billions on R&D in the U.S., providing employment for U.S. workers and research to help expand the productivity of the U.S. economy.
  - U.S. R&D expenditures by CCI members peaked at \$324 million in 2018.
  - U.S. R&D expenditures began to decrease in 2019 – **dropping from \$324 million in 2018 to \$187 million in 2019** and then falling to \$65 million in 2021.
- FTI Consulting, Inc. (FTI) conducted an economic impact study to assess the nationwide economic losses associated with the Act. The analysis accounts for the “upstream” losses to CCI members and their suppliers from lost sales opportunities and the “downstream” losses to CCI members’ customers from lost sales and higher costs.
  - Forecasted upstream and downstream losses associated CCI member losses from 2022-2026 include:
    - An average of 6,600 job losses each year across the U.S. workforce.
    - \$10 billion in lost economic output and \$4.2 billion in lost GDP.
    - Over \$500 million in reduced federal tax revenues and nearly \$300 million in reduced state and local tax revenues.
  - Extrapolated GDP loss to the broader U.S. economy would be \$6.2 billion on average from 2022-2026.



# Methodology and Approach

## Introduction

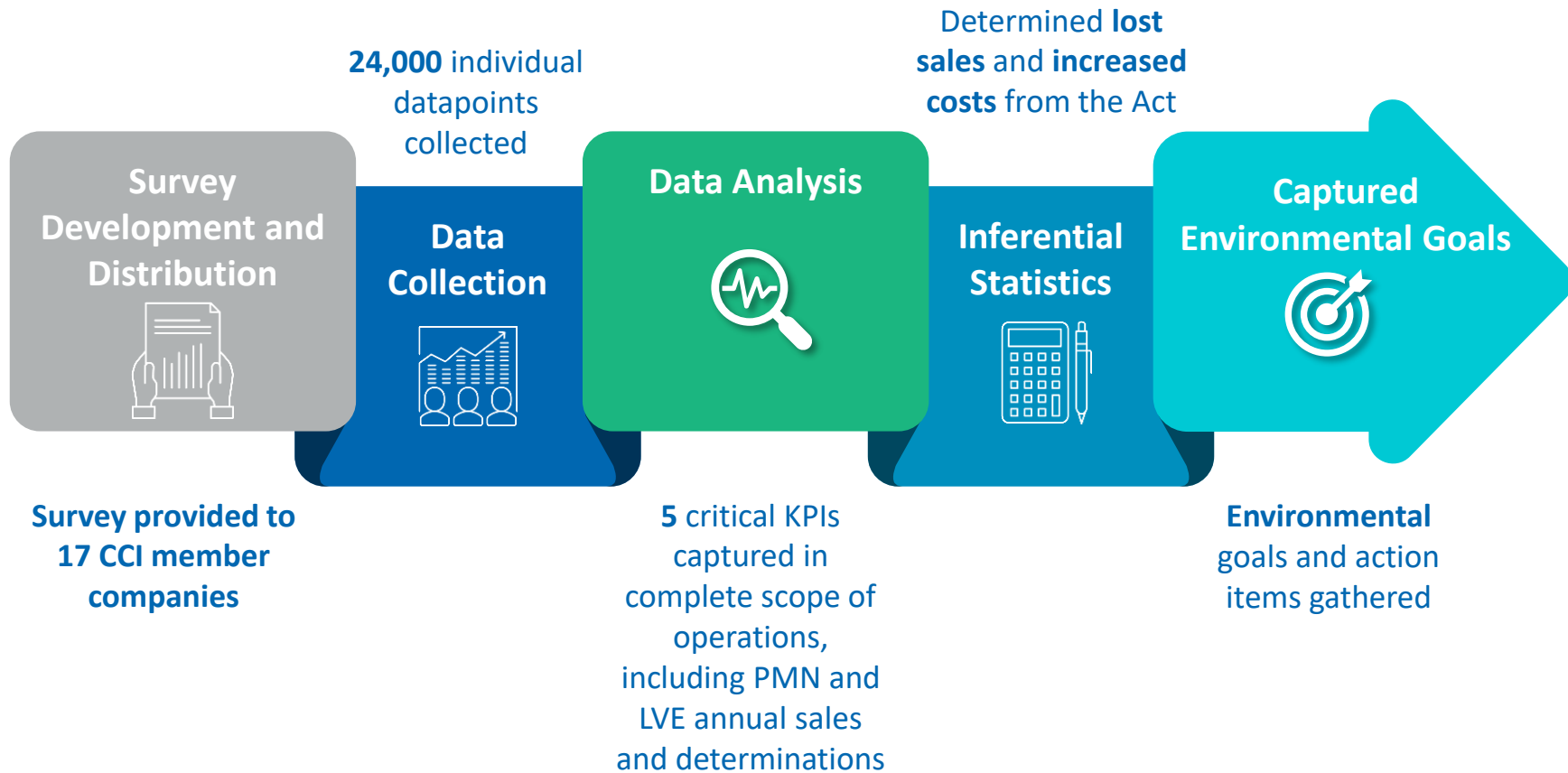
**FTI assessed the economic and fiscal impacts of EPA’s implementation of the Act as it relates to the members of CCI, a significant portion of the chemical sector in the U.S. and globally.**

- Bergeson & Campbell, P.C. engaged FTI to assess the U.S. economic and societal impacts of EPA’s implementation of the Act.
  - The Act enforces a new review process for new chemical notifications submitted under TSCA Section 5.
  - **This research measures the disruptions caused by the Act to the chemical sector and the U.S. economy.**
- Working with CCI, FTI gathered data on CCI members’ new chemical activities and the impacts of the Act on the U.S. chemical sector, using the most common model used in economic impact analysis – IMPLAN.
  - In 2021, CCI members’ new chemical activities resulted in the following:
    - **4,000 U.S. workers directly employed, and another 28,500 jobs supported.**
    - Direct revenue in excess of \$4 billion, resulting in almost \$13 billion of total economy-wide output supported.
    - Almost \$5 billion in total economy-wide GDP supported.
  - FTI initiated a survey to collect data from CCI members to estimate the industrywide impacts of EPA’s implementation of the Act.
    - **Data on new chemical submissions, review times, final determinations, annual sales, R&D expenditures, losses generated by the Act, and environmental benefits and goals.**
    - Over 24,000 data points submitted and **anonymized through aggregation.**
  - FTI assessed the economic and societal impact of the Act disrupting PMNs and LVEs submitted to the EPA:
    - Includes “upstream” losses to the U.S. chemical sector and its suppliers.
    - Includes “downstream” losses to the U.S. chemical sector’s customers of lost sales and higher costs.



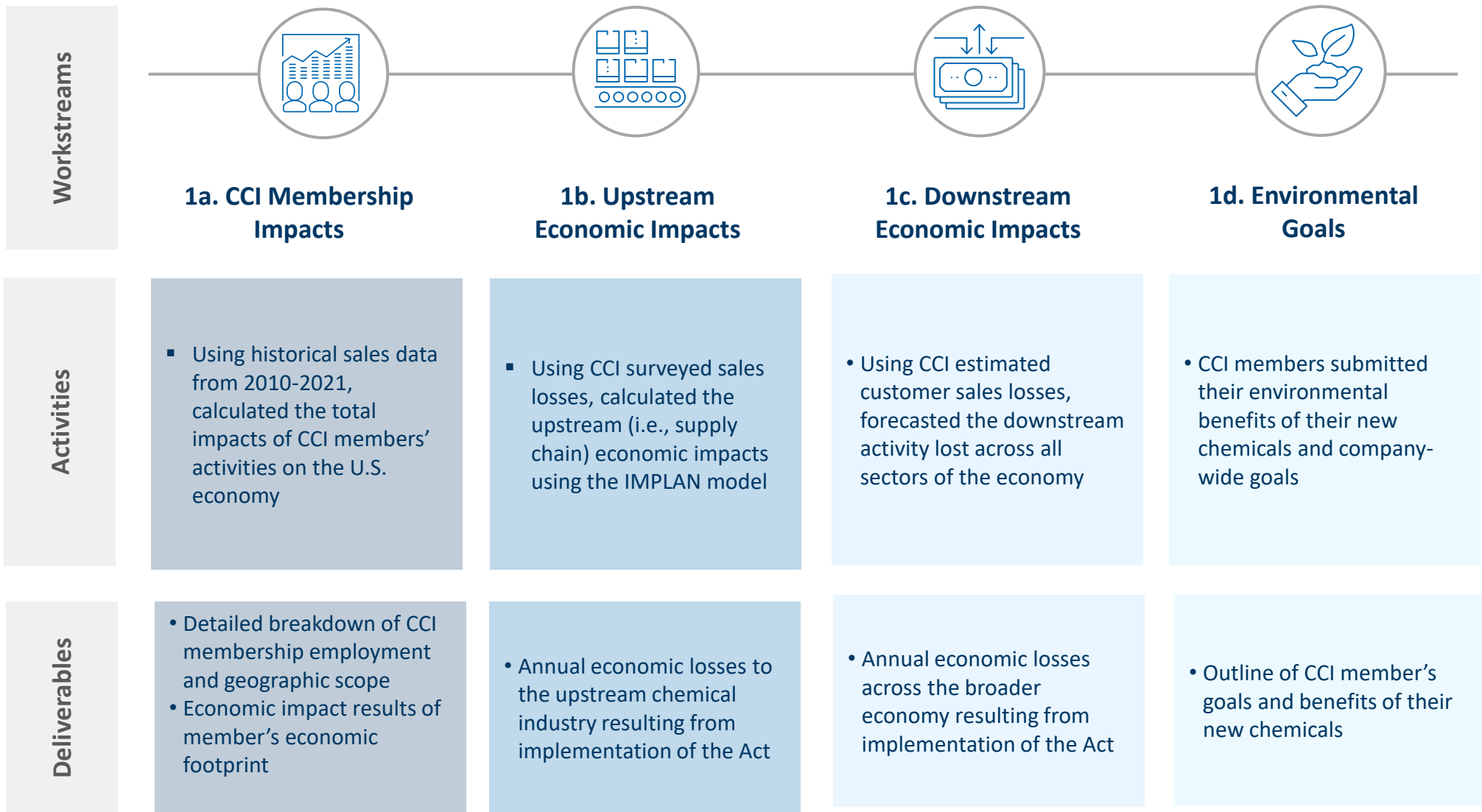
# CCI Membership Survey

FTI conducted a survey to understand the scope and scale of CCI membership and the impacts of the Act on the aggregated membership, the U.S. chemical sector, and the U.S. economy.



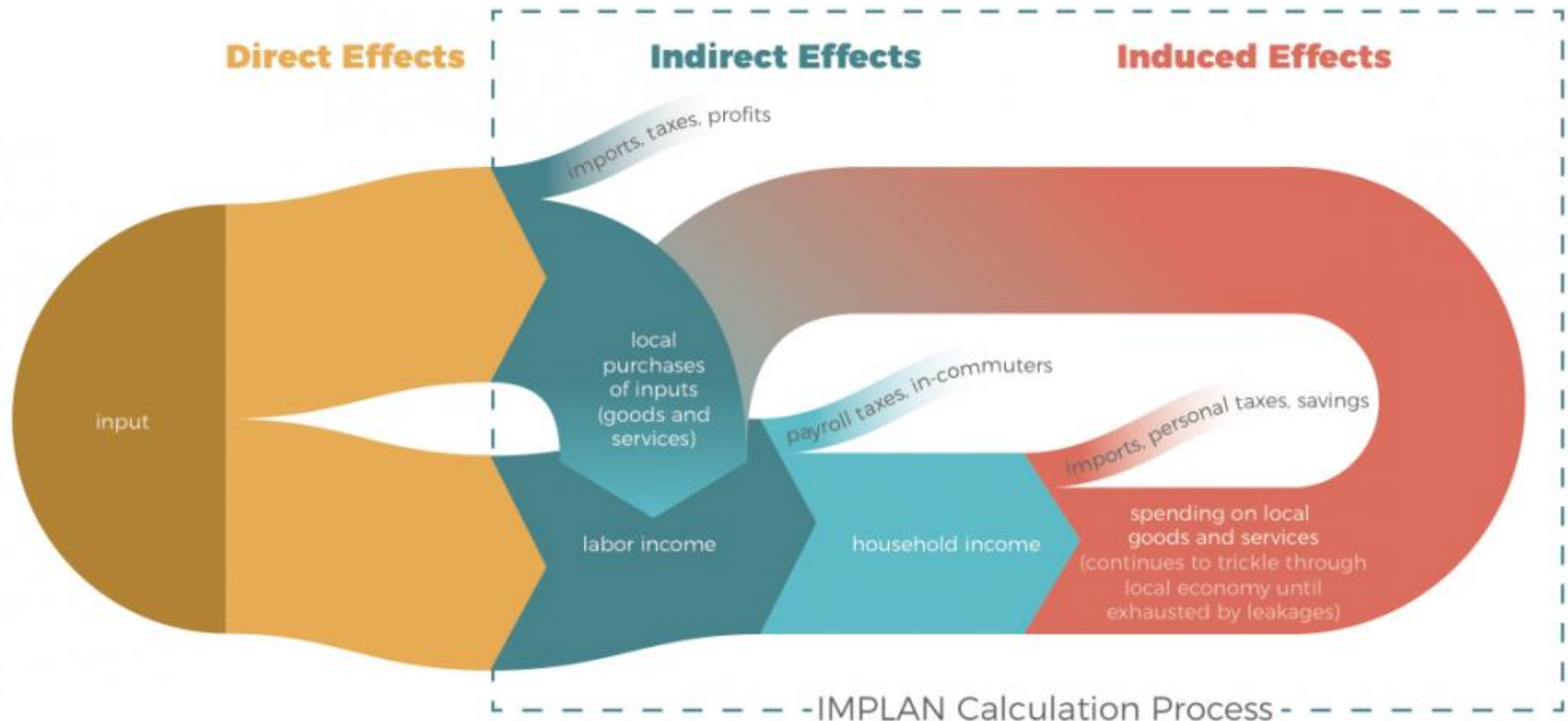


# Economic Modeling Approach



# IMPLAN

IMPLAN accounts for changes in direct expenditures and their effects on supply chains (the “indirect” effect) and consumer incomes and consumer expenditures (the “induced” effect).



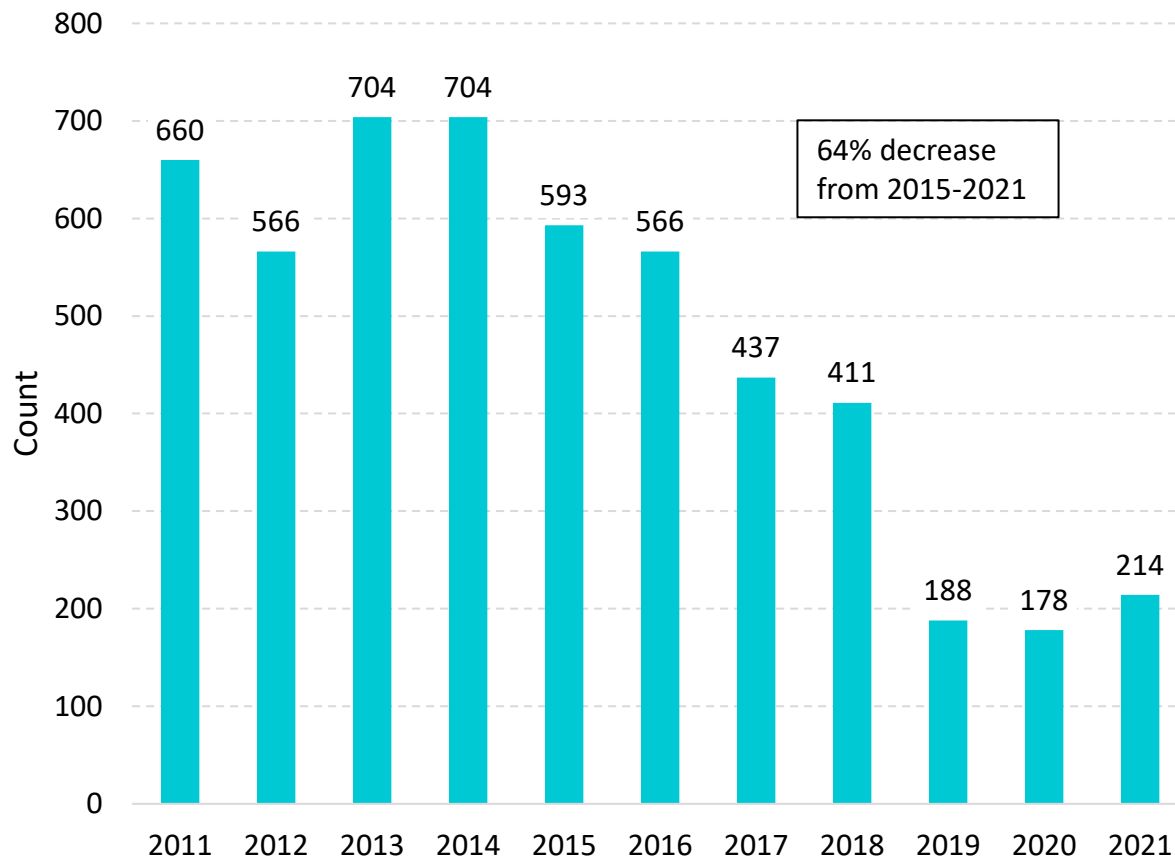


# EPA New Chemical Submission and Determination Analysis

# EPA PMN Submissions

Total PMN submissions to the EPA have declined 64% from 2015-2021.

Total EPA PMN Submissions by Year



Source: FTI analysis of EPA data; <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/status-pre-manufacture-notices>, <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/premanufacture-notices-pmns-and>

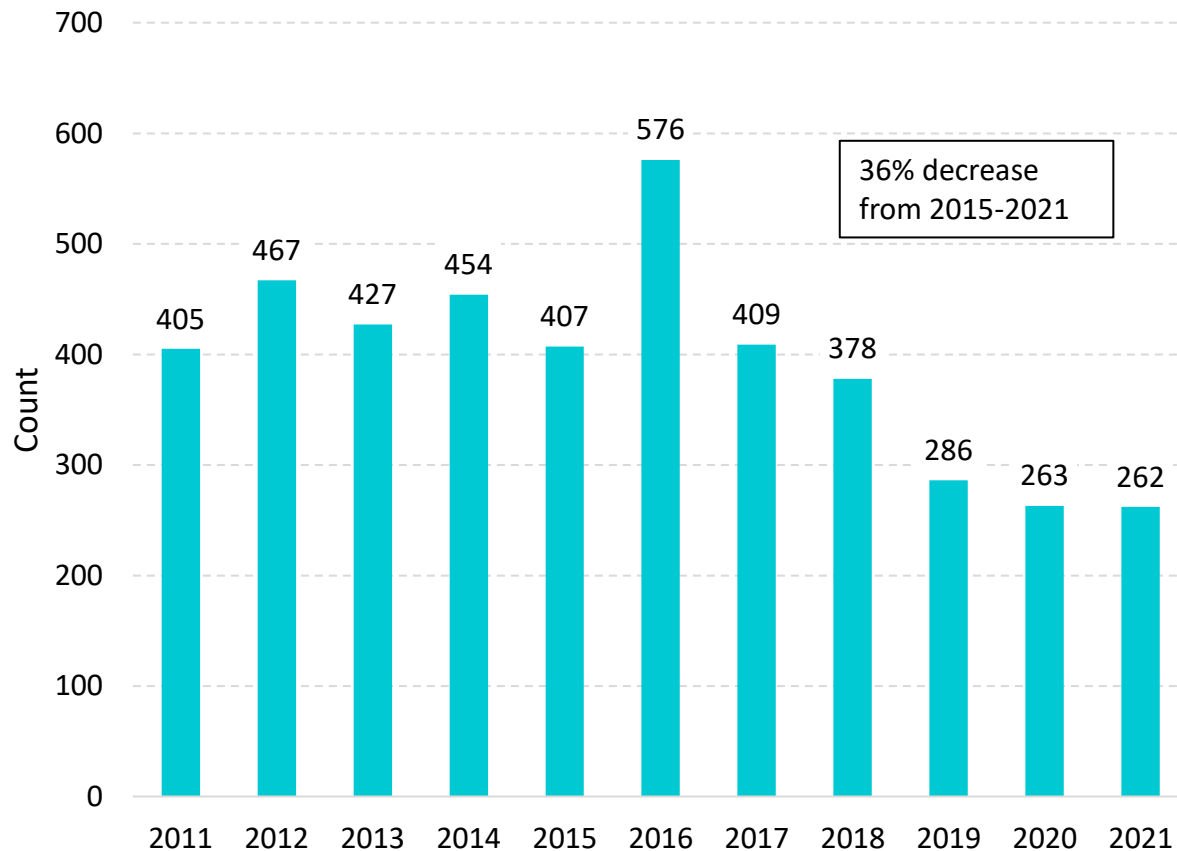
## Discussion

- Before 2016, annual submissions peaked at 704 and averaged slightly under 650 each year as fluctuations were minimal.
- After 2016, annual submissions fell to an average of ~270, and in 2020, submissions hit a record low at 178.
- Submissions decreased by 56% from the average of 2011-2015 to the average of 2017-2021.
- Since 2016, total EPA PMN submissions have experienced extreme volatility paired with steep declines.
- The sharpest annual decrease occurred between 2018-2019 when PMN submissions fell by 54%.
- In 2021, the EPA only received 214 submissions.
- EPA is on pace to receive 192 PMNs in 2022.

# EPA LVE Submissions

Total LVE submissions to the EPA have declined 36% since 2015.

Total EPA LVE Submissions by Year



## Discussion

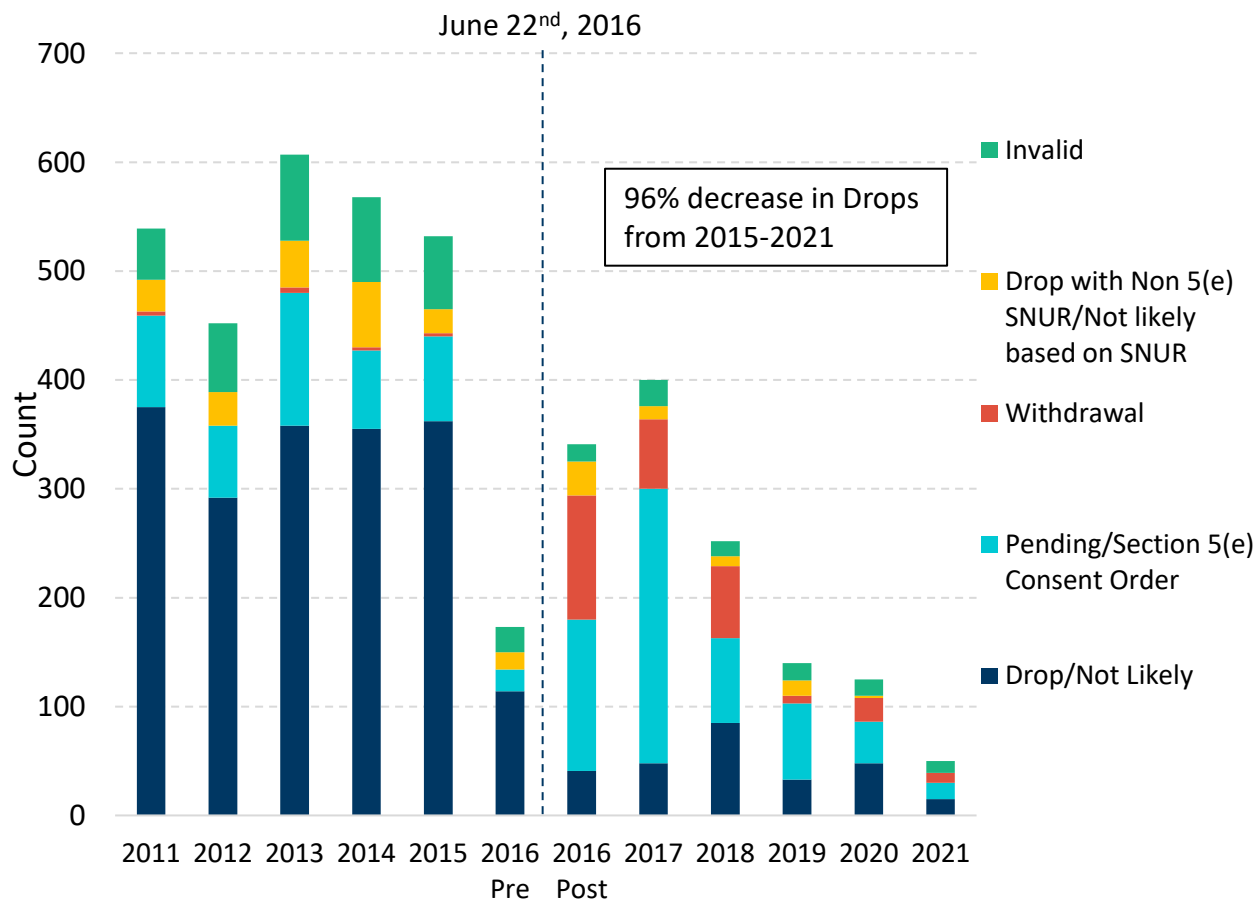
- In 2016, LVE submissions reached a notable peak at 576 submissions.
- A salient decline occurred between 2016-2017, where submissions decreased by 29%.
- LVE submissions have been slowing since 2016.
- LVE submissions averaged 423 annually from 2011-2015 and fell to an average of 302 from 2017-2021, or a drop of 26%.
- From 2019-2021, there were minimal fluctuations in LVE submissions, the average being around 270.

Source: FTI analysis of EPA data; <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/status-pre-manufacture-notice>, <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/exemptions-table>

# Composition of EPA PMN Final Determinations

Since 2016, the number of submissions and determinations has been dropping along with a change in composition of final PMN determinations. Total Drop determinations have fallen over 96% since 2015.

## Composition of EPA PMN Final Determinations



## Discussion

- Before 2016, the aggregate number of PMN final determinations had minimal fluctuations.
- Drop determinations averaged 348 annually from 2011-2015 and fell to an average of 46 from 2017-2021, or a drop of 87%.
- Due to the implementation of the Act, the final determinations created an unprecedented number of ‘Withdrawals.’
- ‘Drop/ Not likely’ represented more than half of final determinations before 2016; then, after the Act passed, it made up only a small portion.

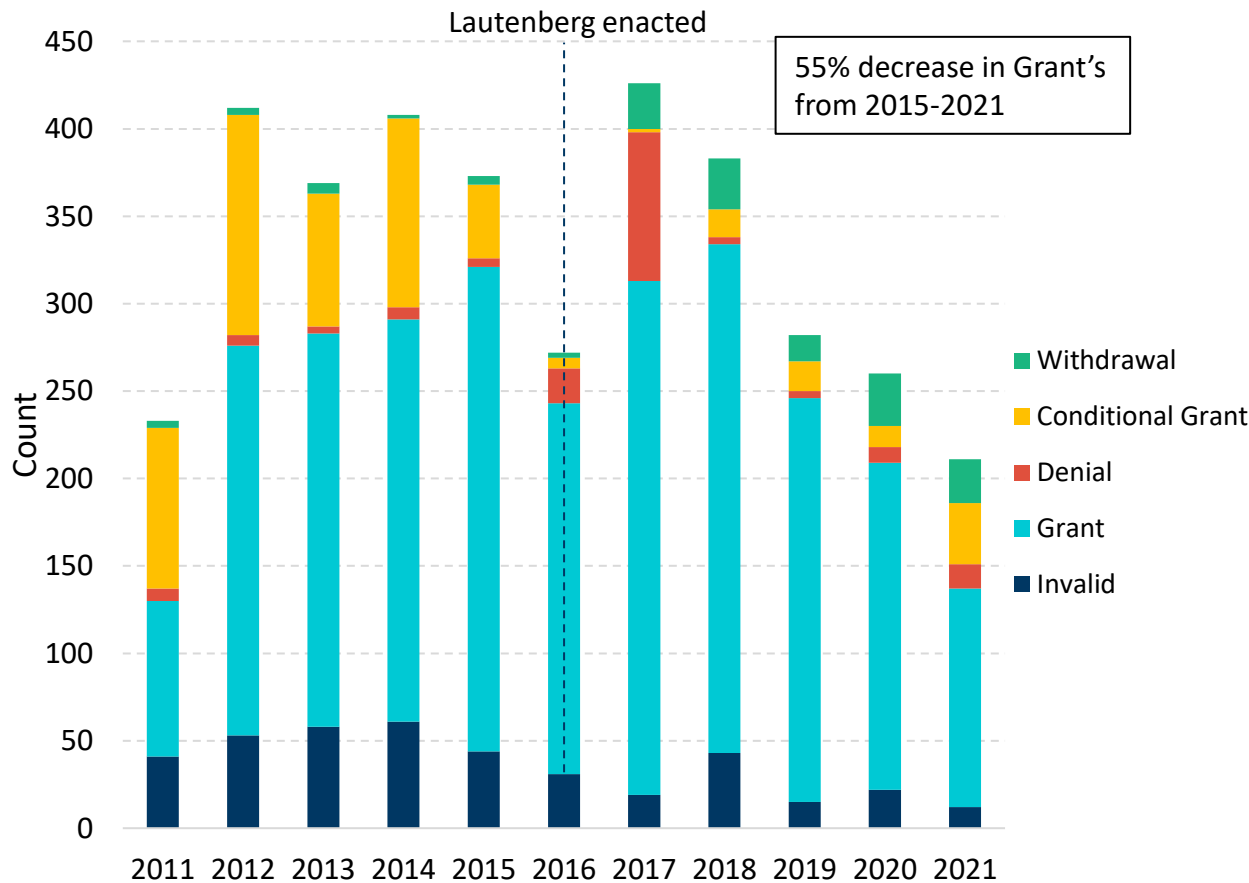
Source: FTI analysis of EPA data; <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/status-pre-manufacture-notices>, <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/exemptions-table>

Note: see Glossary slide for Determination definitions

# Composition of EPA LVE Final Determinations

From 2015-2021 LVE “Grant” determinations declined 55%.

## Composition of EPA LVE Final Determinations



## Discussion

- Before 2016, a majority of the LVE final determinations were either ‘Grant’ or ‘Conditional Grant.’
- After 2016, the EPA continued to approve a majority of LVE submissions.
  - Before 2016, the average submission approval was 209 and rose to 223
- In 2017, there was a noticeable spike in the ‘Denials’ for LVE final determinations.
  - Before the Act, ‘Denials’ averaged six per year, then rising to 23
- Starting in 2017, there has been a steady decline in final determinations year by year.
- In 2021, the final determinations were a little over 200 in total.
- Despite the Act creating bottlenecks, the number of final determinations hit its peak in 2017.

Source: FTI analysis of EPA data; <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/status-pre-manufacture-notice>, <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/exemptions-table>



## Comparison of CCI to EPA

Overall, CCI membership submissions and determinations align closely with overall EPA data.

Category	EPA Data (% Change from 2011 to 2021)	CCI Survey Data (% Change from 2011 to 2021)
<b>PMN Submissions</b>	-68%	-78%
<b>LVE Submissions</b>	-35%	-32%
<b>PMN Drop/Not Likely Determination</b>	-96%	-98%
<b>LVE Grant/Conditional Grant Determination</b>	-12%	-91% (-45% in 2020 <sup>1</sup> )

<sup>1</sup> Computed 2020 results to show an additional benchmark year for context  
Source: FTI analysis of EPA data and CCI survey responses

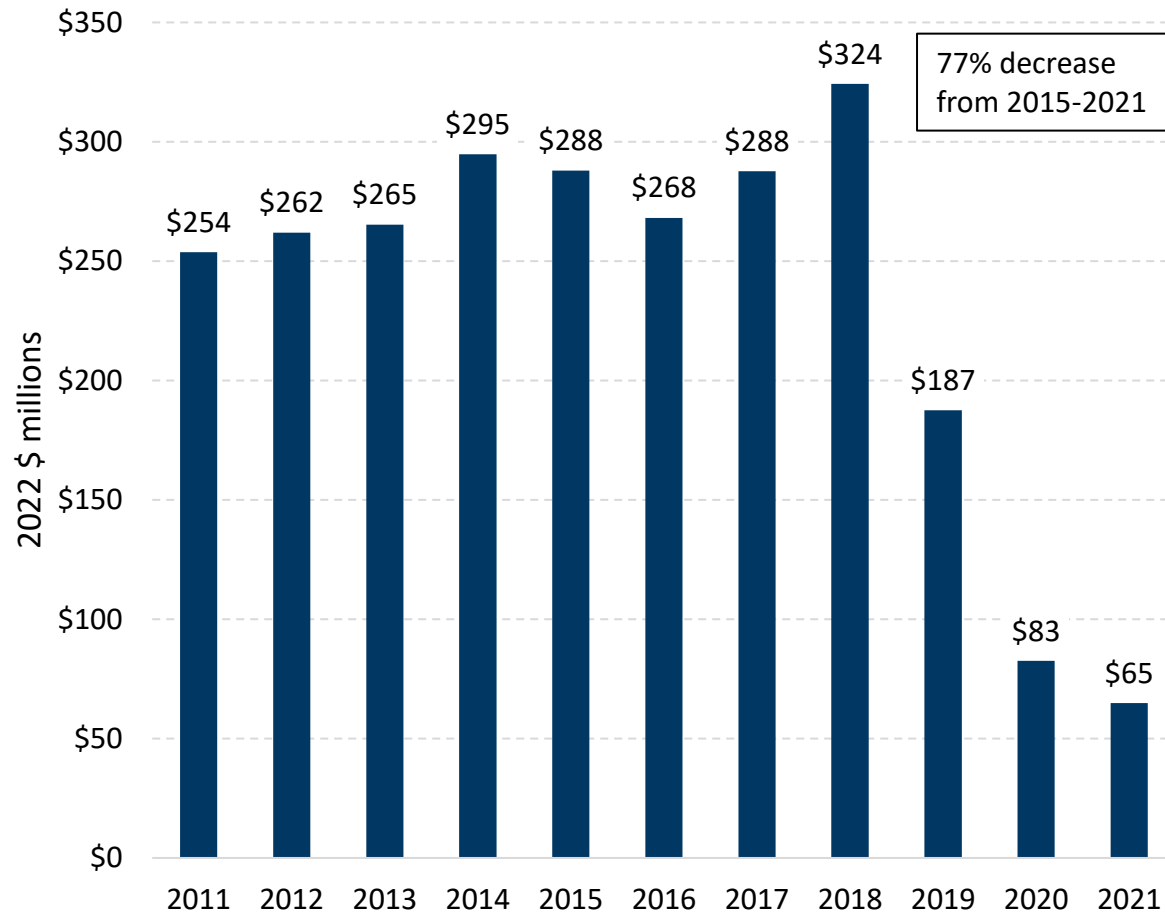


# Survey Results of CCI Membership

# U.S. New Chemical R&D Expenditures

CCI members have invested billions in new chemical R&D since 2011, peaking in 2018 at \$324 million.

## Inflation-Adjusted New Chemical R&D by Year



Source: FTI analysis of CCI member survey responses

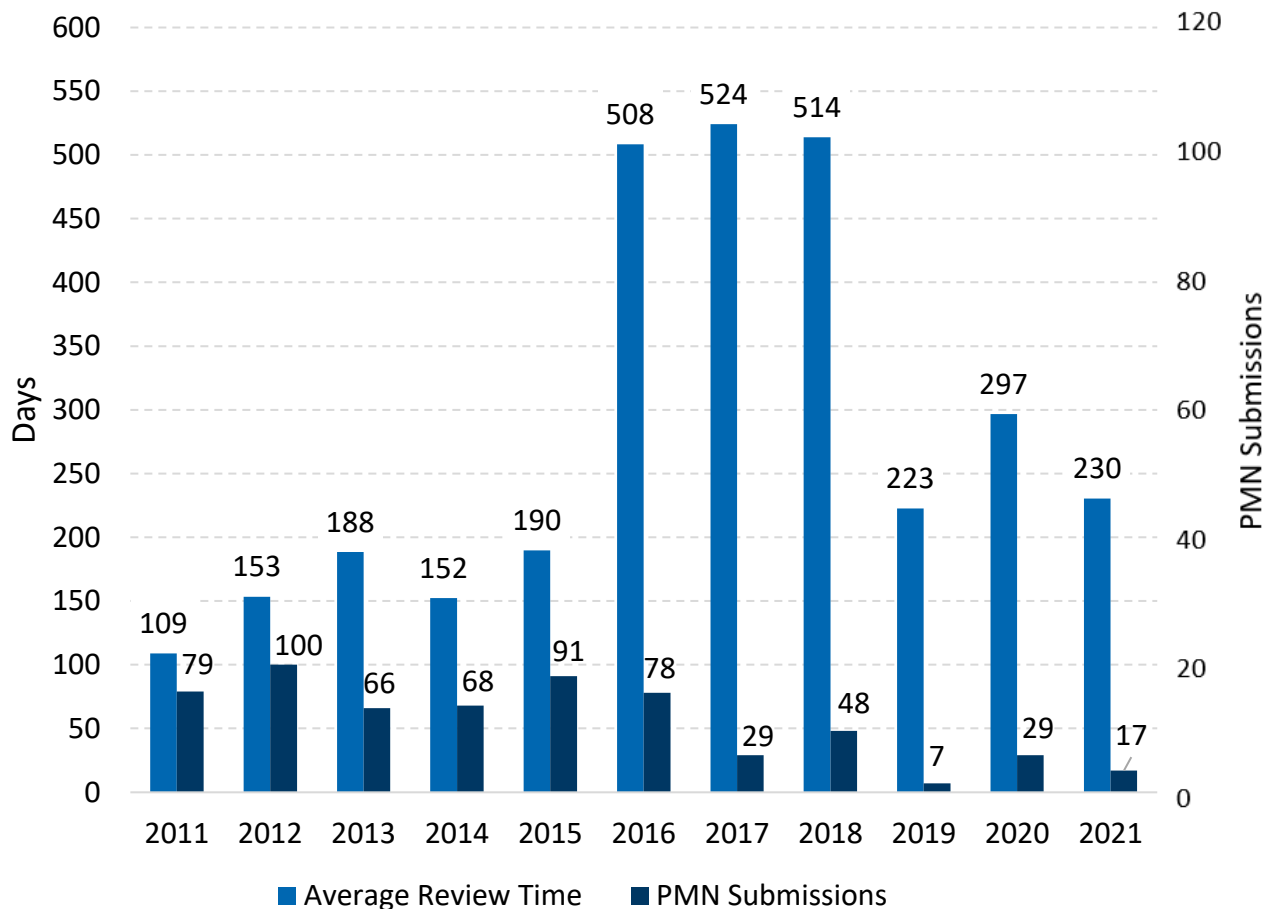
## Discussion

- Since 2011, members invested >\$2.5 billion in new chemical R&D in the U.S.
- Before 2016, fluctuations in new chemical R&D were minor and stayed in the mid to high \$200 million range.
- In 2018, annual investments peaked at \$324 million before experiencing steep declines in the following years.
- The decrease in R&D expenditures from 2018 to 2019 was spread across multiple members operating in different sectors of the chemical industry.
- Changes in individual members' spending on R&D ranged from no change to a 60% drop.
- In 2019, R&D expenditures totaled \$187 million, 42% of 2018 spending.
- In 2021, only \$65 million was invested.

# PMN Review Time

Member PMN review times peaked from 2016-2018 but have since declined; however, review times still have more than doubled since 2011.

## Average Member PMN Review Time



## Discussion

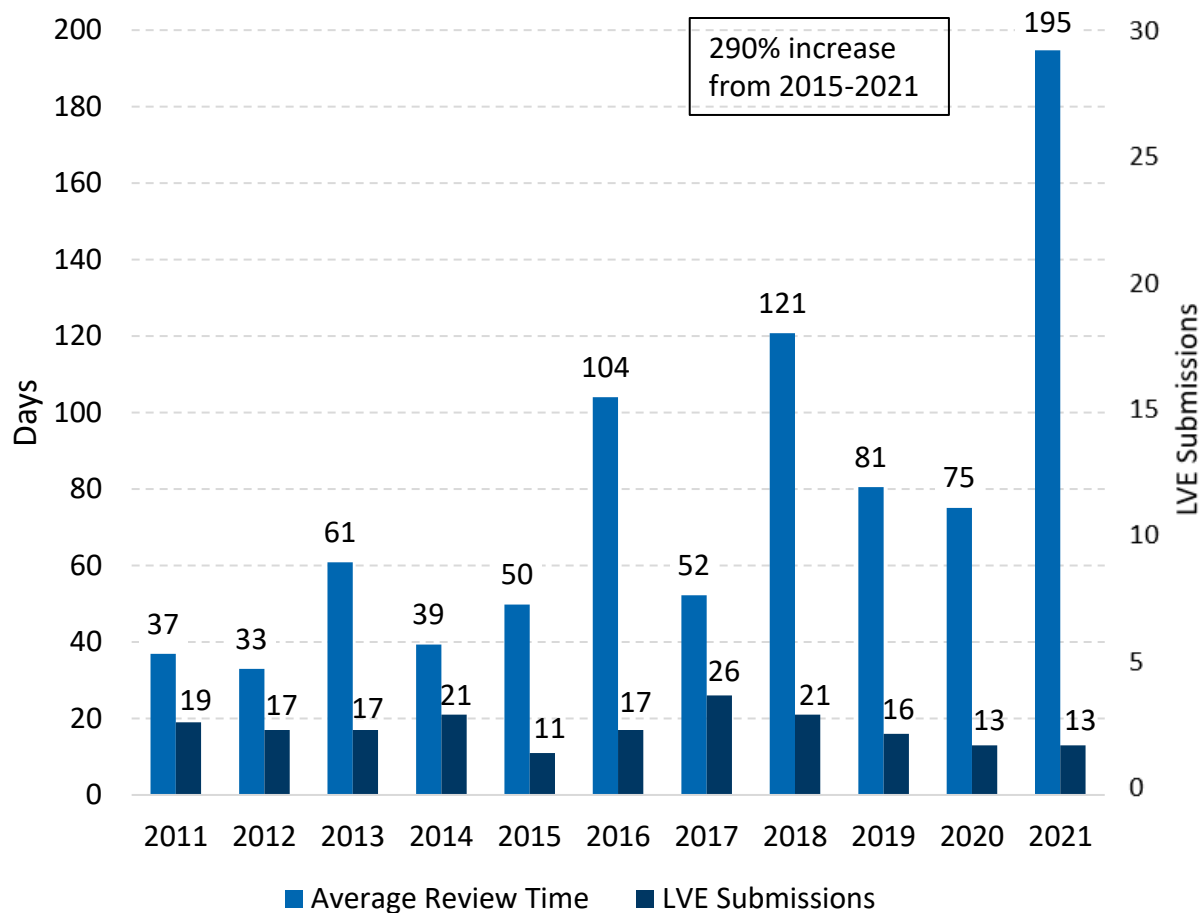
- Review times are defined as the number of days from original submission to an EPA final determination.
- The average review time from 2011 to 2015 was 159 days.
- EPA’s implementation of the Act caused significant bottlenecks in the PMN review process.
- PMNs submitted in 2016 took over a year longer than 2015 submissions to be reviewed.
- In 2021, review times more than doubled those of 2011 submissions.

Source: FTI analysis of CCI member survey responses

# LVE Review Time

Member LVE review times are 290% longer than they were in 2015.

## Average Member LVE Review Time



## Discussion

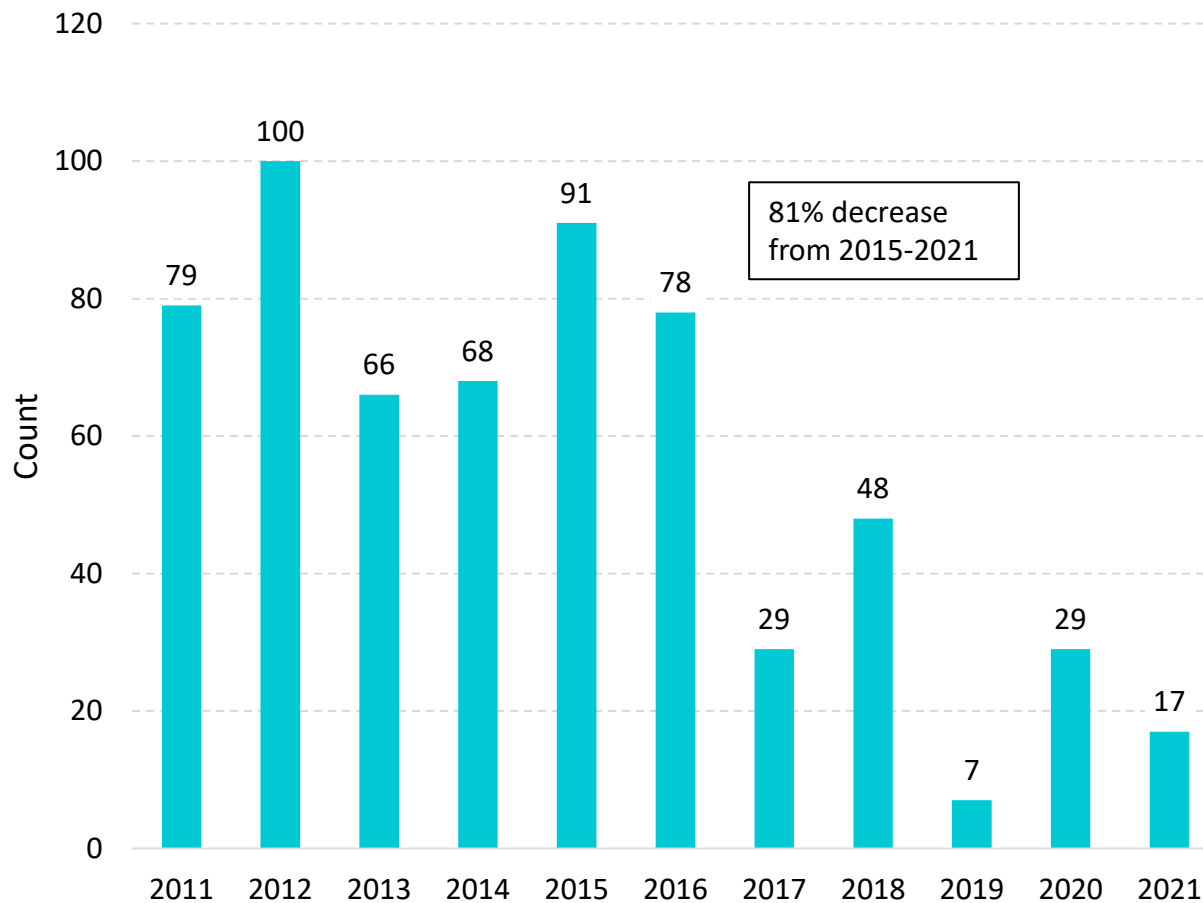
- Since 2016, LVE review times have doubled on average compared to the 2011 to 2015 average of 44 days.
- From 2016 to 2021, review times averaged 105 days.
- Between 2011 to 2015, LVE review times were stable, ranging from 33 to 61 days.
- In 2016, review times jumped to 104 days, double those of 2015 submissions.
- 2021 submissions experienced review times of over six months, close to six times higher than 2011 submissions.

Source: FTI analysis of CCI member survey responses

# Member PMN Submissions

The number of final submissions for CCI members has fallen 81% from 2015 to 2021.

## Member PMN Final Submissions by Year



## Discussion

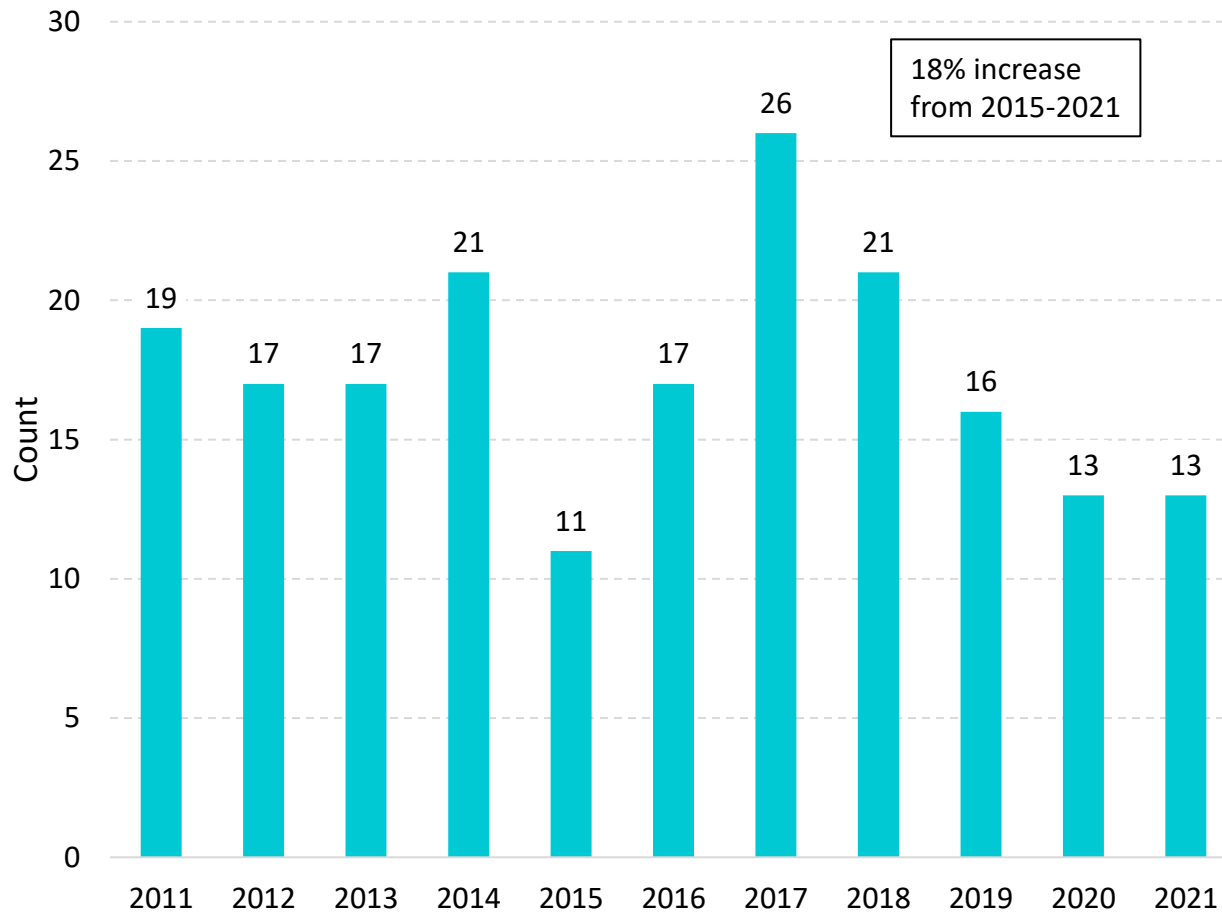
- New chemicals in the PMN market have faced significant disruptions in submitting and receiving determinations since 2016.
- PMN submissions peaked in 2012 at 100, fell to 78 in 2016, and fell to a low of seven in 2019.
- Before 2016, 76 submissions were made a year.
- From 2016-2021, an average of 28 submissions have been made each year.
- As of May 2022, there were 11 PMNs submitted in 2021 still under review PMNs.

Source: FTI analysis of CCI member survey responses

# Member LVE Submissions

The average number of LVE submissions from 2011-2015 and 2017-2021 remained the same; LVE submissions peaked in 2017 and have since fallen.

## Member LVE Final Determinations by Submission Year



## Discussion

- From 2011 to 2015 and from 2016 to 2021, the average number of submissions remained at 17.
- LVE submissions peaked at 26 in 2017, the year after the Act was passed.
- 2020 and 2021 experienced low levels of LVE submissions.

Source: FTI analysis of CCI member survey responses

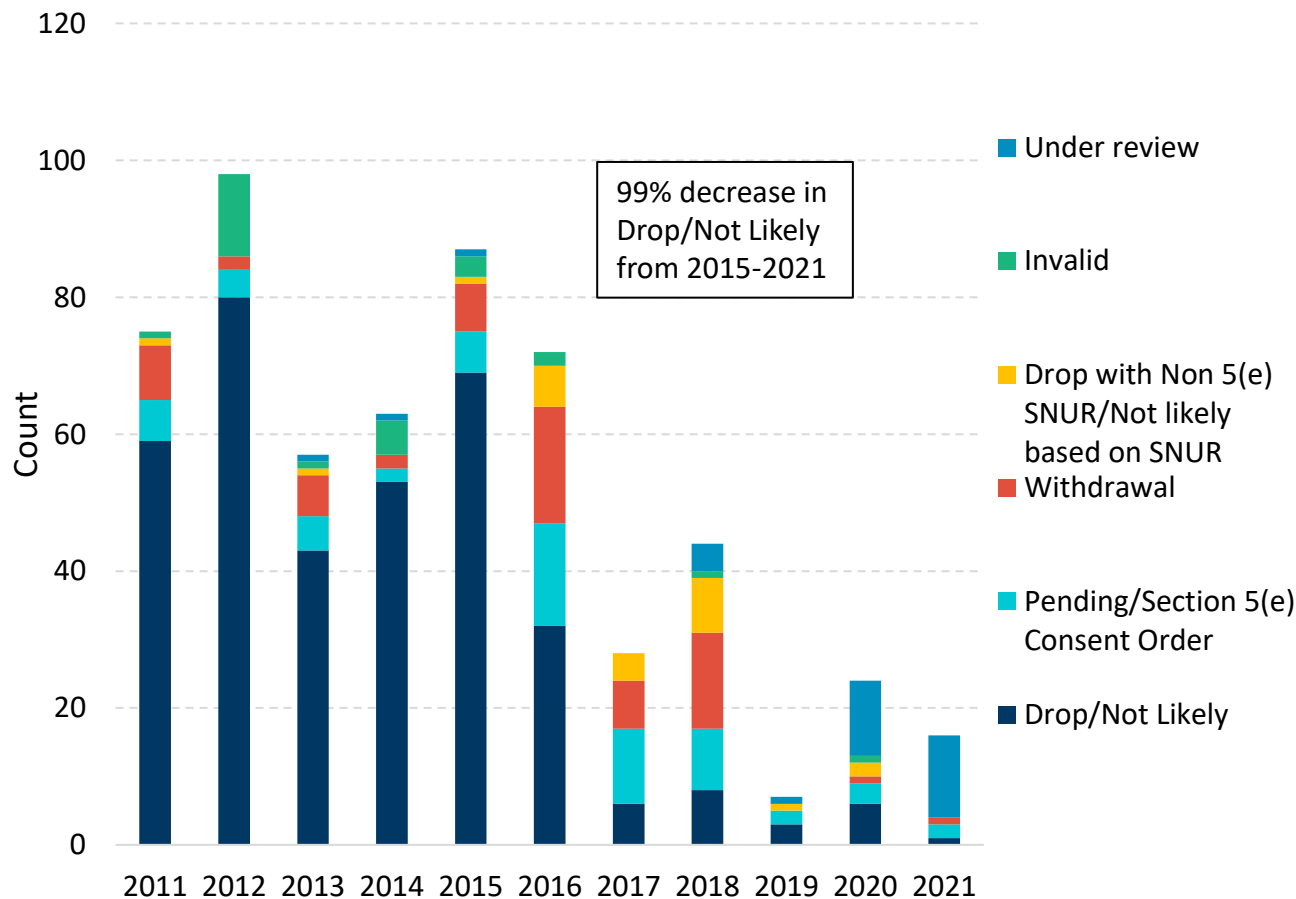


# Composition of Member PMN Final Determinations

The PMN market has faced two significant challenges since 2016, a drop in overall determinations and a breakdown of the mix of determinations received. This trend is apparent in CCI and EPA PMN data.

## Composition of Member PMN Final Determinations

## Discussion



- Before 2016, the mix of final determinations was stable and primarily Drops.
- Since 2016, the mix of determinations has primarily been 5(e) consent orders, followed by Not Likely and Not Likely with SNUR determinations.
- Drop determinations have reduced significantly:
  - From 2011 to 2015, there were 50 Drop’s a year, on average
  - From 2016 to 2021, there have only been 11 Drops in total
- For 2021 PMN submissions, only 1 Not Likely determination has been granted. Members are still waiting on 23 PMNs still under review since 2020.

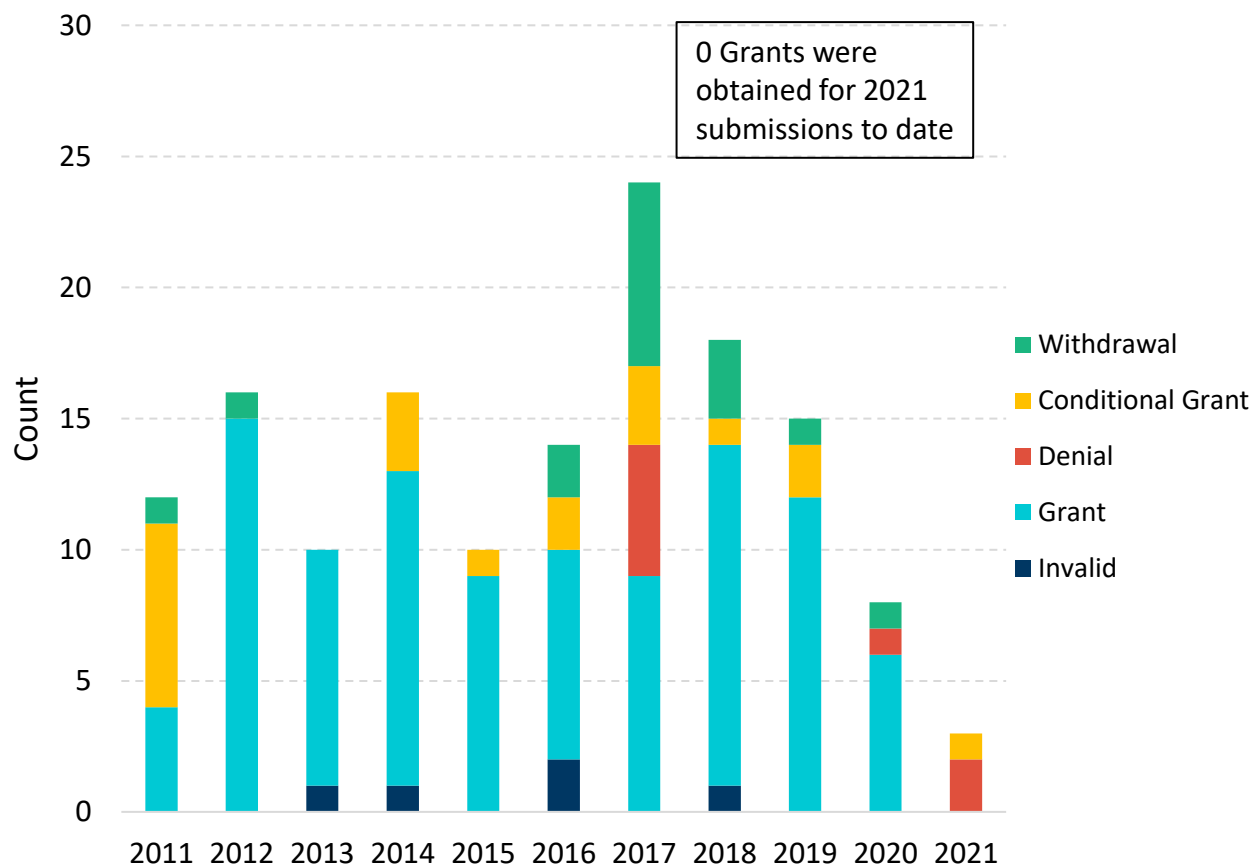
Source: FTI analysis of CCI member survey responses

# Composition of Member LVE Final Determinations

Member LVE determinations peaked in 2017 at 24, before falling to 3 in 2021.

## Composition of EPA LVE Final Determinations

## Discussion



- Before 2016, a majority of the LVE final determinations were either ‘Grant’ or ‘Conditional Grant.’
- After 2016, LVE’s experienced an increase in withdrawals and denials.
- Only 2 Withdrawals were made between 2011 to 2015; Withdrawals rose to 7 from 2016 to 2021.
- There were no denials obtained for CCI members prior to 2017.
- From 2017 to 2021, 8 denials have been obtained for CCI members.

Source: FTI analysis of EPA data; <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/status-pre-manufacture-notice>, <https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/exemptions-table>

## Environmental Results

CCI members reported over two-dozen actionable environmental goals and numerous benefits related to the use of their products, many of which have been stuck in review or given negative determinations.

### Examples of Company Environmental Goals

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- Some of the most notable goals of CCI members towards helping the environment include:
  - 50% reduction in greenhouse gases (“GHG”) by 2030.
  - **Net-zero emissions** by 2030 and/or net-positive emissions by 2050.
  - **Carbon neutral in direct operations by 2025.**
  - Upkeep a 100% global renewable energy plan.
  - **Zero waste to landfill by 2025** for all major manufacturing facilities.
  - **Complete ban on single-use plastic products** by 2025.
  - **Fully phase out coal consumption** by 2030.

### Examples of Product Environmental Benefits

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- Many chemicals produced by CCI members have environmental benefits, such as:
  - A **reduction in greenhouse gasses over three times** compared to other market products.
  - **Reduce water consumption by 215 million cubic meters per year by 2025.**
  - Longer product lifespans resulting in a **reduction in long-term waste.**
  - Focus on **biodegradable packaging.**
  - Reduces the weight of packaging and materials.
  - **Groundbreaking biotechnology** advances environmentally friendly production processes.

These goals are examples from individual member companies; member goals are individual and any representation of goals or aspirations are individual to that company and may not reflect all member positions on topics outlined. Many new chemicals help members and their customers achieve these and other, similar goals.

Source: FTI analysis of CCI member survey responses



# Survey Analysis: Economic and Fiscal Impact Results

## Economic and Fiscal Impact Analysis Methodology

FTI assessed both the “upstream” impacts on CCI members and their suppliers and the ‘downstream’ impacts on CCI customers’ lost sales and higher operating costs.

The upstream impacts represent the lost sales opportunities for CCI members and their supply chain due to delay in new chemical approvals.

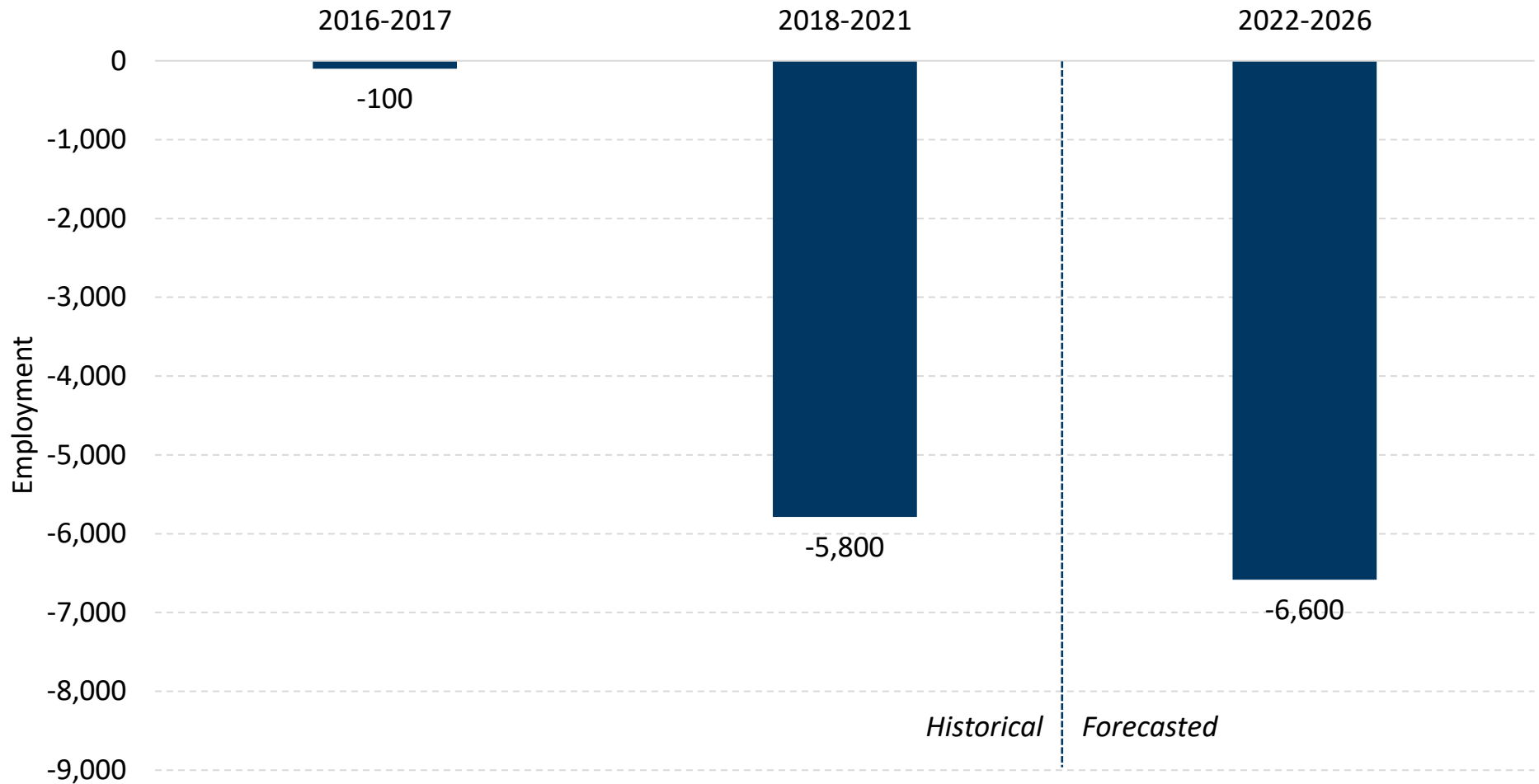


The downstream impacts represent either foregone sales for CCI members’ customers or higher costs passed along to customers due to delay in new chemical approvals.



## Employment Impacts on the U.S. Economy from CCI Member Losses

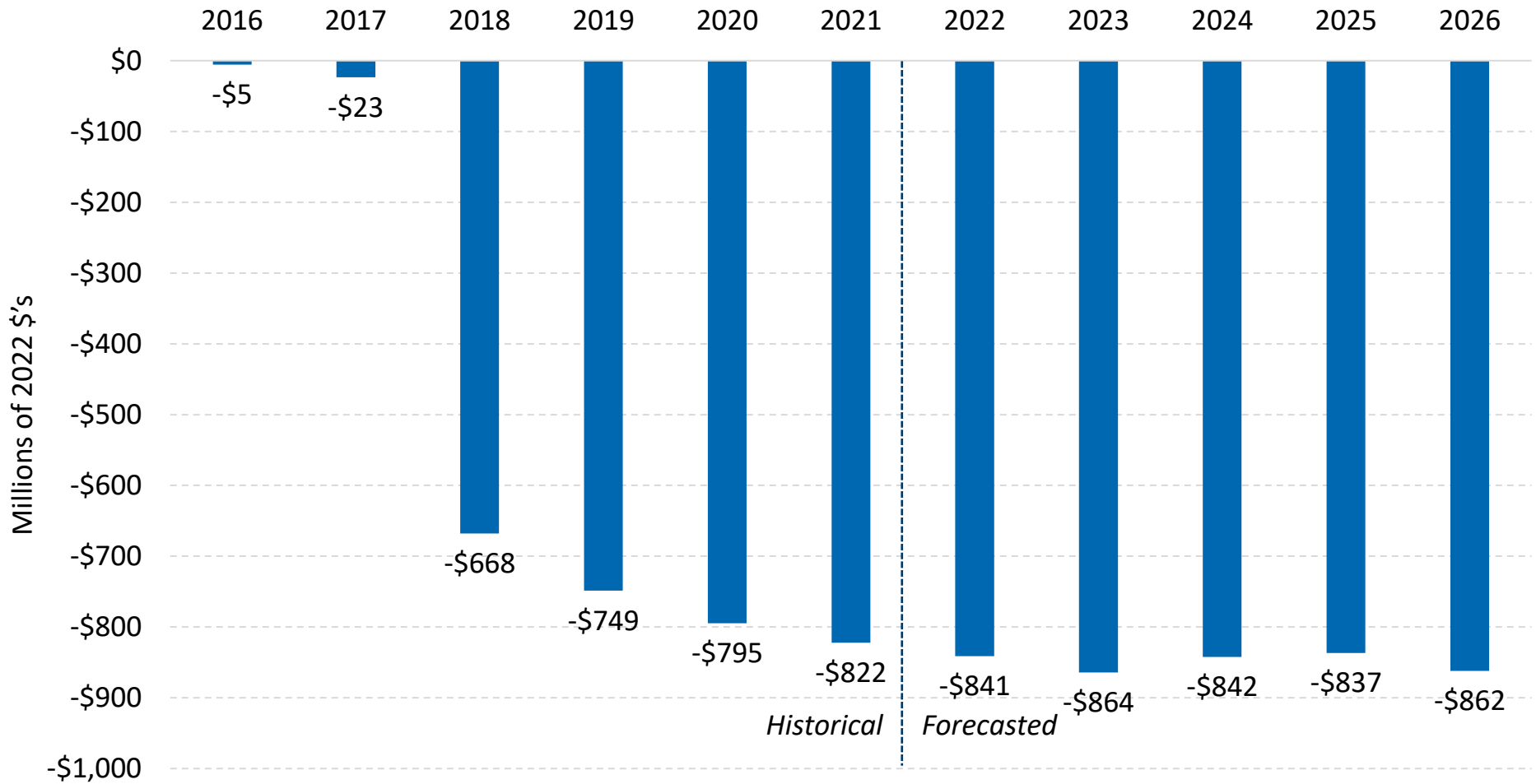
After the Act’s passage, U.S. sustained employment losses due to CCI member losses grew to 5,800. Sustained employment losses are expected to increase to approximately 6,600 jobs, on average.



Note: Forecasted values based on average losses from 2016-2022  
 Source: FTI analysis of CCI member survey responses

## GDP Impacts on the U.S. Economy from CCI Member Losses

GDP losses resulting from CCI member losses rose to \$822 million by 2021 and are expected to average \$850 million from 2022 to 2026.

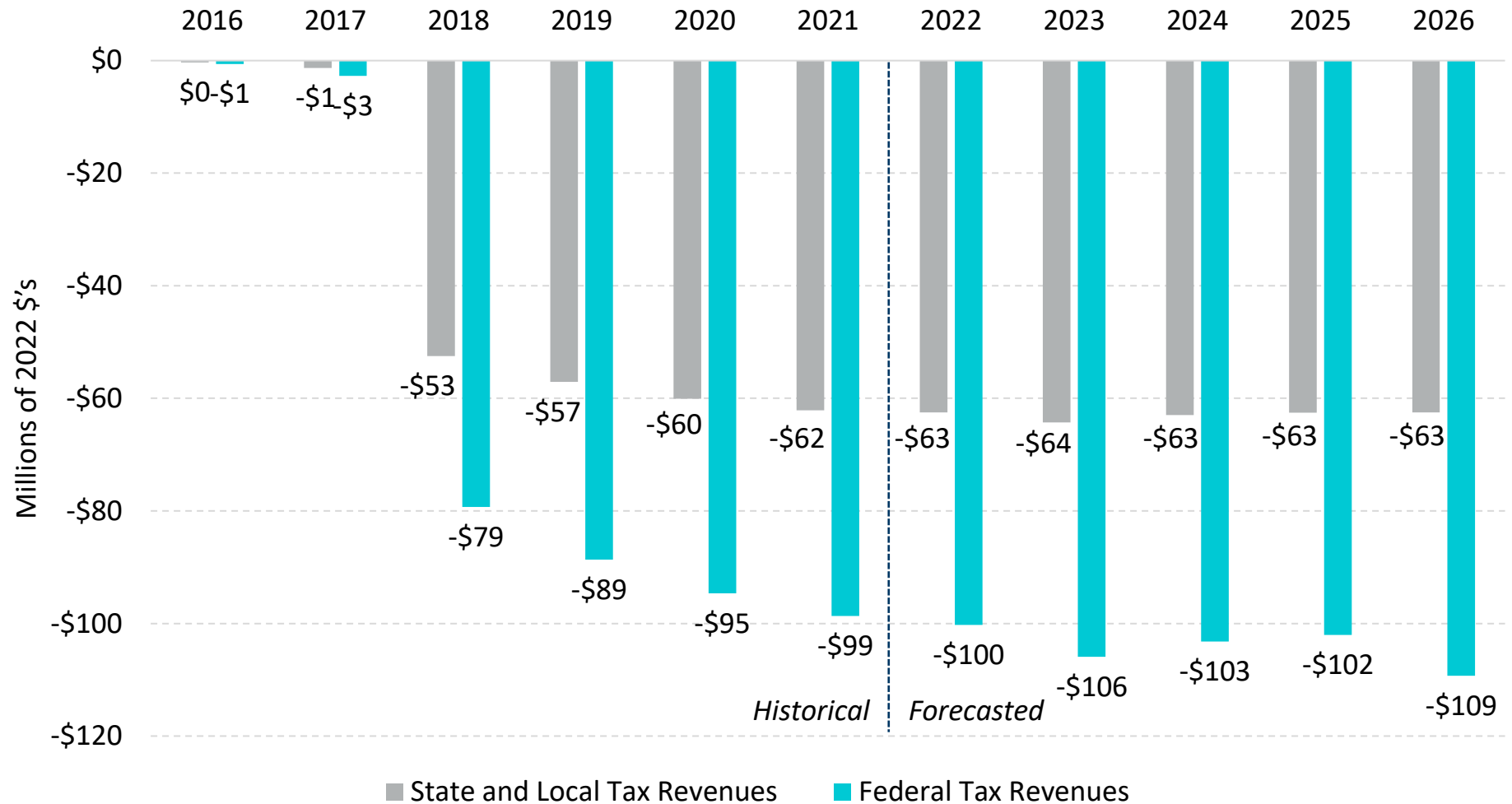


Source: FTI analysis of CCI member survey responses



## Fiscal Impacts on the U.S. Economy from CCI Member Losses

The fiscal impacts from CCI member losses results in \$60 million and \$100 million in lost state/local and federal tax revenues, respectively, in 2021 and then declines to \$63 million and \$104 million, on average, afterwards.



Source: FTI analysis of CCI member survey responses

## Cumulative U.S. Economic Impacts from CCI Member Losses: 2022-2026

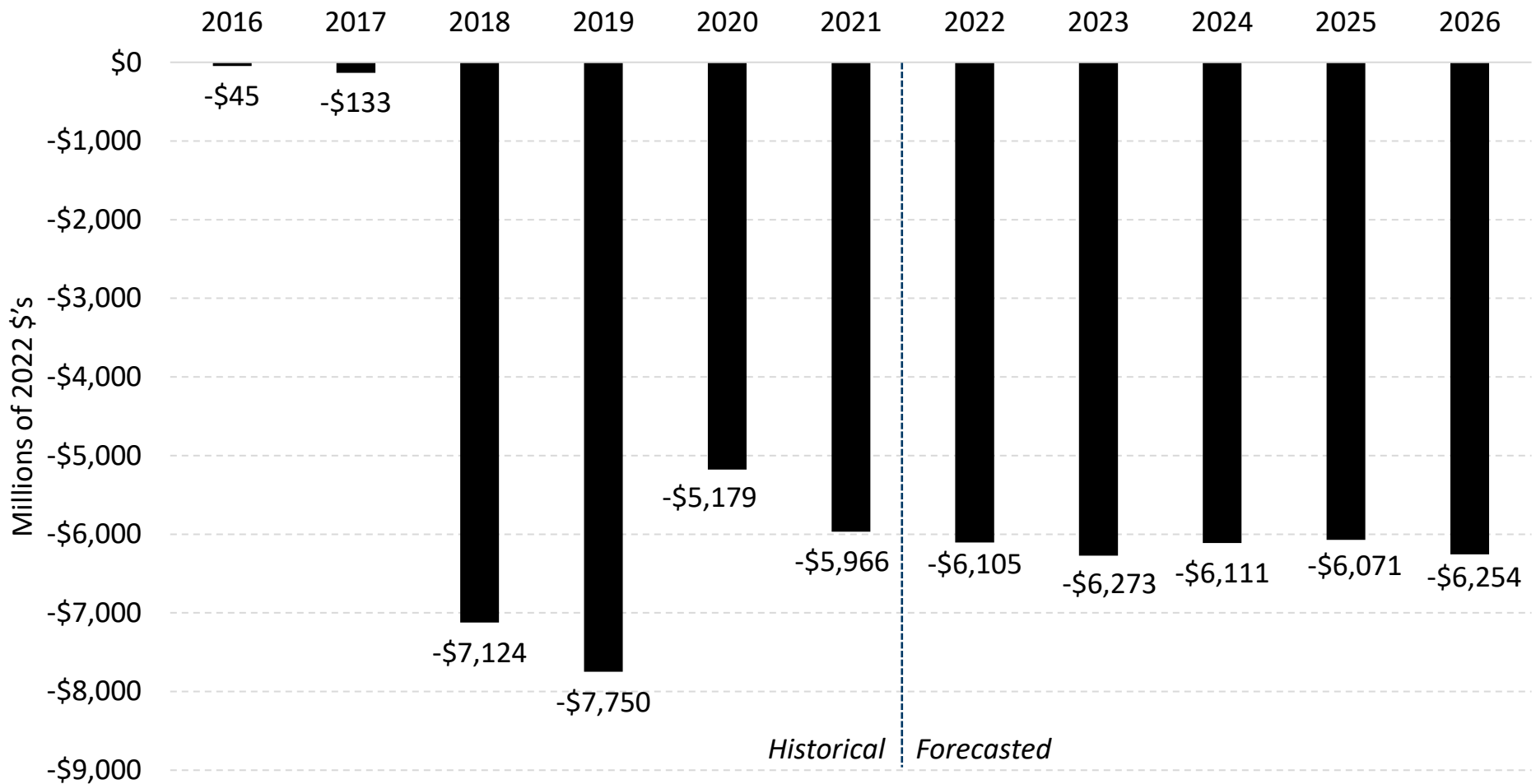
Members’ survey results imply \$10 billion in cumulative lost “upstream” and “downstream” revenue from 2022 and 2026, resulting in annual employment losses of 6,600 and GDP losses of \$4.2 billion economy-wide.

	Units	“Upstream” Impact	“Downstream” Impact	Total Impact
<b>Employment</b>	Annual Average Count (#)	-1,400	-5,200	-6,600
<b>Sales Output<sup>1</sup></b>	2022 \$ millions	-\$2,700	-\$7,200	-9,900
<b>GDP</b>	2022 \$ millions	-\$1,000	-\$3,200	-4,200
<b>Labor Income</b>	2022 \$ millions	-\$572	-\$1,800	-2,372
<b>Federal Tax Revenues</b>	2022 \$ millions	-\$129	-\$392	-521
<b>State and Local Tax Revenues</b>	2022 \$ millions	-\$60	-\$254	-314

<sup>1</sup> Sales output is equivalent to revenues  
Source: FTI analysis of CCI member survey responses

## Extrapolated Economy-Wide GDP Impacts

Extrapolating CCI member losses to the broader new chemical market would result in an average GDP loss of **\$6.2 billion** from 2022-2026.



Note: Extrapolated using CCI members' share of PMN submissions relative to EPA PMN submissions from 2016-2021.  
 From 2022-2026 extrapolation relied on 2021 CCI members' share of PMN submissions relative to EPA PMN submissions  
 Source: FTI analysis of CCI member survey responses

## Appendix A - Glossary

Term	Definition
<b>Economic Impact</b>	Economic impact analysis is a technique allowing an analyst to trace spending throughout an economy and measure the cumulative effects of that spending.
<b>Employment</b>	Employment in IMPLAN is the sector-specific mix of fulltime, parttime, and seasonal employment.
<b>Output</b>	For all sectors, output equals the value of production, which is equal to net sales plus inventory changes.
<b>GDP</b>	The final market value of all goods and services produced by labor and property located within the borders of a region. GDP is also known as the value-added, which is the difference between a sector's total output minus the cost of its intermediate inputs.
<b>Labor Income</b>	The share of GDP accruing to labor, such as through wages and salaries or fringe benefits.
<b>Drop/Not Likely</b>	PMN approved to commence without regulatory restriction.
<b>Pending/Section 5(e) Consent Order</b>	Approval with regulatory action.
<b>Withdrawal</b>	Submission is removed by submitter prior to EPA's final determination.
<b>Drop with Non 5(e) SNUR/Not likely based on SNUR</b>	Approval with regulatory action.
<b>Invalid</b>	Substance is not subject to TSCA, is already on the Inventory, or does not include required information.
<b>Under review</b>	Submission is being reviewed by the EPA.
<b>Conditional Grant</b>	LVE approval to commence pending restrictions.
<b>Grant</b>	LVE approval to commence.
<b>Denial</b>	LVE is denied from commencing.



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