Michael Bergen
VP Marketing & Analytics
with Industrial Info Resources

U.S. Spending Forecast

2020

INDUSTRIAL MARKET OUTLOOK

Industrial Info Resources
Chris Smith
Manager of Labor Analytics
7 Years Tenure with IIR

Research Lead

Industrial Info Resources
**Our Global Reach**

**175,000+ Projects in Progress worth $14.22 trillion**

Based on active projects with future completion dates and QC’d in the last 12 months

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Flags Represent IIR’s World Regional Research Offices

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### Latin America
- 8,906 Projects
- $1.23 Trillion
- 18% Growth

### Africa
- 7,725 Projects
- $952 Billion

### Oceania
- 4,033 Projects
- $416.08 Billion

### Asia
- 78,817 Projects
- $7.37 Trillion

### Europe
- 33,055 Projects
- $1.89 Trillion

### North America
- 34,242 Projects
- $2.66 Trillion

### South America
- 18,010 Projects
- $916 Billion

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Based on active projects with future completion dates and QC’d in the last 12 months.
<table>
<thead>
<tr>
<th>Industry Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIR's coverage is defined by the 12 industrial groups listed below, representing a current plant population of 259,000+ operational and under development (new plant construction) locations. These 12 groups represent 44 sectors, 1,070 standard industry codes (SIC) and 17,960 unique IIR SIC product codes.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Power</th>
</tr>
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<tbody>
<tr>
<td>ELECTRIC POWER GENERATION AND TRANSMISSION &amp; DISTRIBUTION</td>
</tr>
<tr>
<td>Generation, Transmission &amp; Distribution, Microgrids and Battery Storage</td>
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<table>
<thead>
<tr>
<th>Oil &amp; Gas</th>
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<tbody>
<tr>
<td>TERMINALS</td>
</tr>
<tr>
<td>Oil, Gas, &amp; Chemical Storage</td>
</tr>
<tr>
<td>PIPELINES</td>
</tr>
<tr>
<td>Oil, Gas &amp; Refined Products Transmission</td>
</tr>
<tr>
<td>PRODUCTION</td>
</tr>
<tr>
<td>Offshore and Onshore Oil &amp; Gas Processing</td>
</tr>
<tr>
<td>ALTERNATIVE FUELS</td>
</tr>
<tr>
<td>Gas &amp; Liquids Production</td>
</tr>
<tr>
<td>PETROLEUM REFINING</td>
</tr>
<tr>
<td>Hydrocarbon Processing Industry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industrial Processing and Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDUSTRIAL MANUFACTURING</td>
</tr>
<tr>
<td>Durable &amp; Non-Durable Goods Manufacturing</td>
</tr>
<tr>
<td>CHEMICAL PROCESSING</td>
</tr>
<tr>
<td>Petrochemicals, Specialty Chemicals, Plastics &amp; more</td>
</tr>
<tr>
<td>PULP, PAPER &amp; WOOD</td>
</tr>
<tr>
<td>Mills, Forest Products &amp; Converting Plants</td>
</tr>
<tr>
<td>METALS &amp; MINERALS</td>
</tr>
<tr>
<td>Mines, Mills and Processing Plants</td>
</tr>
<tr>
<td>FOOD &amp; BEVERAGE</td>
</tr>
<tr>
<td>Processing &amp; Distribution/Storage Facilities</td>
</tr>
<tr>
<td>PHARMACEUTICAL &amp; BIOTECH</td>
</tr>
<tr>
<td>Manufacturing Facilities &amp; Research Labs</td>
</tr>
</tbody>
</table>
Tracking Investment Activity Across the Life-span of a Plant

- Grassroot / Greenfield Plants
  - New Plant Construction
  - Operational Plants
    - In-Plant Capital investments
    - Planned Maintenance Events
    - Remediation/Dismantling
  - Decommissioning Plants

IIR Research Methodology

- Project Scopes
- Milestone Dates
- Key Equipment Needs
- Key Plant & Project Personnel

Spending Statistics:
- Project Probability
- Start Date Slippage
- Restarts
- Fallout Rates

Completed
Active
On Hold
Cancelled

All data is gathered, validated and tracked by telephone direct from source. All data is only telephone verified & validated from initial discovery through to regular reviews and checking.

Time: Plant Investment Life-Span

- Unit Additions / Plant Expansions
- In-plant Capital Projects
- Maintenance – Planned & Unplanned

@ Industrial Info Resources
Consumer
Before: Unemployment rate 3.5% / 100K per month growth
Now: 13.3% to 21mm Unemployed, 10% Year End
Hard hit: Retail, Leisure, Hospitality, Transportation, Restaurants, O&G

Personal Expenditures
Consumption: -3.9% vs +1.9%
Durable Goods: -9.5% vs +1.8%
Non-Durable Goods: 2.0% vs +2.3%
Services: 1.9% vs -4.8%
Savings Rate: 7.5% to 11%

ISM Mfg. Index (43.1 May)
Slight improvements. Supply chain issues remain, new orders up slightly. Growth in production came from Furniture, Wood Products, Food/Beverage

Industrial Production (-11.2% April)
Production down 10.3% ex-auto, Auto/Parts -71.7% Utilization Capacity 64.9%, Manufacturing 61.1%

New Vehicle Sales
Revised from 16.7 MM units to 13.2 MM Units
Single-Family Residential
740,000 New Home Sales
1.0 M New Home Starts (-300K)

U.S. GDP Growth Annualized
11 Year Expansion Cycle
Done

Industries Impacted:
- Metals & Minerals
- Pulp, Paper & Wood
- Food & Beverage
- Industrial Manufacturing
- Oil & Gas, Power Generation

2Q20 -34.6% GDP
-6% GDP Annualized

Business Cycle Status
Full Employment Mid-Cycle 2017
Late Stage Expansion
Greater Risk Of Contraction
Top: Feb
Bottom: May
-6% GDP Annualized
Great Recession

Economic growth thru strong consumer base
Record stock market build wealth effect
Shale downstream impact growth continues

Crude Price Volatility
H $61.43 L $34.73

Election Year

Forced Recession

Crude Price Volatility
H $63.27 L $20.09

Election Year

Crude Price Volatility
H $54.06 L $26.21

Election Year

Year End
-40.2%
North America Projects in Development for 2020 (As of June 22, 2020)

Jan 2020 = $713.51 Bn  |  Year End Est = $289.60 Bn or 59.4% fallout

**Planning Phase**

- 1,704 Projects worth $91.51 Billion (USD)
  - Possible 4% fallout = $3.66 Billion
  - Estimate: $87.85 Billion*

  Challenges
  - COVID-19 Safety Measures (Reduces productivity and reduces population)
  - Supply chain is disrupted due to shutdowns and site restrictions
  - Third parties not allowed on site – Essential workers only
  - Restrictions on Travelers

**FID Approved Pre-Construction**

- 1,219 Projects worth $91.15 Billion (USD)
  - +1,399 Projects worth $6.36 Billion (USD) completed
  - Estimate: $97.51 Billion*

  Challenges
  - Liquidity - Funding of Start-Ups
  - Supply Chains and Material Inflation
  - Higher Labor Cost / Lower Productivity
  - Unknown length of the 2nd Great Recession
  - EPC’s likely to carry burden of project costs

**Under Construction**

- 3,077 Projects worth $169.33 Billion (USD)
  - Possible 40.8% fallout = $69.14 Billion
  - Estimate: $100.46 Billion*

  Challenges
  - COVID-19 Safety Measures (Reduces productivity and reduces population)
  - Supply chain is disrupted due to shutdowns and site restrictions
  - Third parties not allowed on site – Essential workers only
  - Restrictions on Travelers

**North America Projects in Development for 2020**

- June 2020 = $371.52 Bn
- Jan 2020 = $713.51 Bn | Year End Est = $289.60 Bn or 59.4% fallout

- $298.60 Billion Year End Estimate
- Down 10.7% from 2019’s $334 Billion

- $284.85 Billion Year End Estimate

- Planned Maintenance
  - 6,720 Projects worth $13.17 Billion
  - Possible 3% fallout = $0.40 Billion
  - Est. $12.78 Billion*

- North America Projects in Development for 2020
  - 1,219 Projects worth $91.15 Billion (USD)
  - FID Approved Pre-Construction
  - Under Construction
  - Planning Phase
## 2020 Industrial Top Line Forecast (USA)

### $283.35b - $44.97b Overall 13.7% sharp decrease
Win + 0.03b Loss -$45.29b

### Gains
Food & Beverage +0.03b

### Large Losses
Oil & Gas M/D: -31.3% or -$23.37b
Chemical Processing: -11.6% or $3.31b
Metals & Minerals: -15.5% or $3.66b
Ind. Manufacturing: -14.4% or $10.2b

Topline Forecast is a spending model utilizing IIR’s probability factoring for project selection, duration modeling for spending allocation and gap filling to associate spending to over 60,000 Operational Plants and New Plants.

The forecast does not include Offshore, Power Transmission, Freight and Light Rail, Spec Warehouses, Hospitals and Government facilities.

### United States

<table>
<thead>
<tr>
<th>Industry</th>
<th>Pre-COVID 2020 TTL</th>
<th>Capital</th>
<th>Maintenance</th>
<th>2020 Total</th>
<th>% Growth from 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Generation</td>
<td>$73.84</td>
<td>$51.55</td>
<td>$15.89</td>
<td>$67.44</td>
<td>-3.8%</td>
</tr>
<tr>
<td>Terminals (O&amp;G)</td>
<td>$7.42</td>
<td>$3.84</td>
<td>$0.69</td>
<td>$4.53</td>
<td>-32.2%</td>
</tr>
<tr>
<td>Pipelines (O&amp;G)</td>
<td>$26.71</td>
<td>$15.87</td>
<td>$4.38</td>
<td>$20.26</td>
<td>-27.1%</td>
</tr>
<tr>
<td>Production (O&amp;G)</td>
<td>$19.42</td>
<td>$12.42</td>
<td>$1.31</td>
<td>$13.73</td>
<td>-43.4%</td>
</tr>
<tr>
<td>Alternative Fuels (O&amp;G)</td>
<td>$4.46</td>
<td>$2.08</td>
<td>$0.89</td>
<td>$2.97</td>
<td>-20.5%</td>
</tr>
<tr>
<td>Petroleum Refining (O&amp;G)</td>
<td>$16.24</td>
<td>$7.61</td>
<td>$5.18</td>
<td>$12.79</td>
<td>-19.7%</td>
</tr>
<tr>
<td>Chemical Processing</td>
<td>$30.19</td>
<td>$17.81</td>
<td>$7.55</td>
<td>$25.36</td>
<td>-11.6%</td>
</tr>
<tr>
<td>Metals &amp; Minerals</td>
<td>$25.80</td>
<td>$13.69</td>
<td>$6.32</td>
<td>$20.01</td>
<td>-15.5%</td>
</tr>
<tr>
<td>Pulp, Paper &amp; Wood</td>
<td>$9.67</td>
<td>$4.98</td>
<td>$2.96</td>
<td>$7.94</td>
<td>-12.6%</td>
</tr>
<tr>
<td>Food &amp; Beverage</td>
<td>$25.39</td>
<td>$15.01</td>
<td>$8.04</td>
<td>$23.03</td>
<td>1.4%</td>
</tr>
<tr>
<td>Industrial Manufacturing</td>
<td>$68.92</td>
<td>$45.15</td>
<td>$14.86</td>
<td>$60.02</td>
<td>-14.4%</td>
</tr>
<tr>
<td>Pharmaceutical &amp; Biotech</td>
<td>$27.05</td>
<td>$19.79</td>
<td>$5.48</td>
<td>$25.27</td>
<td>-1.0%</td>
</tr>
<tr>
<td><strong>Total (2Q20 Forecast Update)</strong></td>
<td><strong>$335.11</strong></td>
<td><strong>$209.80</strong></td>
<td><strong>$73.56</strong></td>
<td><strong>$283.35</strong></td>
<td>-13.7%</td>
</tr>
<tr>
<td><strong>Total (1Q20 Forecast Release)</strong></td>
<td><strong>$252.33</strong></td>
<td><strong>$82.78</strong></td>
<td><strong>$335.11</strong></td>
<td></td>
<td>1.2%</td>
</tr>
</tbody>
</table>
2020 U.S. Industrial Forecast for Power Generation

<table>
<thead>
<tr>
<th>$ in Billions</th>
<th>Capital Spending Only</th>
<th>Wind &amp; Solar Bubble Peak</th>
<th>Natural Gas Bubble Peak</th>
<th>Conventional Power Spending Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind $</td>
<td>12.2</td>
<td>16.1</td>
<td>15.3</td>
<td>11.8</td>
</tr>
<tr>
<td>Solar $</td>
<td>6.5</td>
<td>8.1</td>
<td>10.0</td>
<td>5.2</td>
</tr>
<tr>
<td>Gas $</td>
<td>11.3</td>
<td>13.3</td>
<td>17.6</td>
<td>19.8</td>
</tr>
<tr>
<td><strong>Coal/Nuclear</strong> $</td>
<td><strong>18.9</strong></td>
<td><strong>18.6</strong></td>
<td><strong>15.6</strong></td>
<td><strong>16.3</strong></td>
</tr>
</tbody>
</table>

**2020 U.S. Industrial Forecast for Power Generation**

- In 2021 Wind Drops: 12.1
- Solar Rises: 11.6

Map Density Reflecting Dollars to Invest
- Red = High
- Yellow = Medium
- Green = Low
Natural Gas Demand

U.S. Natural Gas Cumulative Demand Growth (2016-2025)

Gas Demand
Below $4MMBtu Gas projected 30+ Years Out.

Natural Gas Supply Growth 25% 2015-2020

Demand Drivers
LNG exports – 8 Bcf/d Under Construction
Coal displacement – Coal-to-Gas Switching
Gas power generation – New Construction
Gas-on-gas competition – Pushing out imports
Pipeline exports to Mexico
New industrial demand (Ammonia and Methanol)

$198 Billion Advanced Stage Industrial Projects scheduled for startup between now and late 2019.

NGL Demand
U.S. Supply Growth 50+% 2016-2025
U.S. is now the Largest Exporter of Propane in the World
U.S. Ethane Crackers to add 740,000 BBL/d demand by 2021

Lower 48 Onshore U.S. Gas Production full-year average

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2017</th>
<th>2018</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCF/d</td>
<td>61</td>
<td>74</td>
<td>81</td>
<td>93</td>
</tr>
</tbody>
</table>
Drivers for Oil & Gas Production & Chemical Industries

Global Export Market for NGL, Plastics and LNG – Long term outlook is positive with demand improvements.

Eastern Countries increase middle class population that will lift demand for global products.

U.S. Crude production growth will bring back midstream spending in pipelines, terminals and natural gas processing plant investments.
LNG Market Key Points

New online capacity from the U.S. has tighten the supply market.

Global demand for LNG has decreased since COVID-19

Export levels will return by the end of 2021.

Next year’s FID’s will be limited to
1. Freeport LNG train 4
2. Cheniere Energy Midscale

Further out, next likely projects:
1. Tellurian, Driftwood
2. Sempra, Cameron 4&5
3. Venture Global, Plaquemine
2020 U.S. Industrial Forecast for Industrial Manufacturing

Capital and Maintenance Spending Forecast

Drivers for Durables & Non-Durable Goods Mfg./Distribution

- Competition from Foreign Automotive Makers / Electric Vehicle movement
- Datacenter growth stimulated by cloud computing and storage
- Automation, telecommunications, Processing capabilities
- Increased E-Commerce and the desire for next day/same day deliveries
- USMCA helps to elevate supply chain concerns through NA re-shoring.
Labor Analytics – U.S. Forecast for 2020 - 2021

Gulf Coast Region Remains High for Labor Demand
Labor Analytics – Gulf Coast Forecast for 2020 - 2024

Plant Spending Forecast

- **COVID Update April 2020**
- **Q1 Forecast**

Craft Labor Hours Forecast

- **COVID Update**
- **Q1 Forecast**
The sudden economic disruption caused by the swift containment response to COVID-19 has caused a supply-and-demand shock across the world. The end result on plant capital and maintenance activity is a pullback in spending, most of which have been delayed to 2021 or beyond. In order to preserve cash, plant owners defer large capital projects while smaller capital projects and planned maintenance work become the focus.

- There has been a slow restart in bringing back personnel as sites begin to open back up. Companies have modified shifts and personnel levels to accommodate added safety and CDC requirements.

- Some crafts are experiencing more absenteeism similar to what happened in the recent past. With government subsidies and lifestyle changes to cope with loss of income, some crafts are holding out on returning to sites.

- An aging population and a continued fear of the virus has also kept personnel from returning to the industry.

- Travelers may also be affected as travel and occupancy restriction stay in effect for some areas.

- Wages remain steady at pre-COVID rates even though there were discussions around the possibility of wage softening. There remains a wait and see attitude around wage rate as companies see turnarounds and outages being planned to kick-off again as early as the fourth quarter of 2020.

- With this anticipated restart and the risk of labor constrains as stated earlier, companies feel they will again be battling for personnel with higher wages being the draw for the skilled workers.