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Executive Summary

This report defines a framework for the unconventional natural gas value chain and identifies representative companies in each stage, as per definition of the value chain adopted for the study. The main focus of the report is on major companies in the up and midstream stages of the value chain. However, the report presents major companies in stages further downstream covered by the study. The reason for the focus on up and midstream stages is two-fold. First, given the current level of development of the unconventional natural gas value chain in the state, those are the stages where most opportunities are likely located. Second, the tristate already hosts a considerable number of manufacturers from the downstream stages.
1 Introduction

This report defines the unconventional natural gas value chain as beginning with the gas extraction, continuing through gas processing, and including the first downstream tiers of intermediate manufacturing industries. Accordingly, the report identifies important players in each stage of the unconventional natural gas value chain, with focus on the upstream and midstream stages. The reason for that focus is two-fold. First, in the current level of development of the unconventional natural gas value chain in the state, those are the stages where most opportunities are likely located. In addition, the tristate already hosts a considerable number of manufacturers from the downstream stages. The study focuses on the feedstock value chain rather than the energy, infrastructure or logistics value chains. However, each of these offers economic opportunities for the state and the region. Stages within the upstream development for purposes of evaluating supply chain opportunities include exploration, site planning and preparation, site construction, drilling, hydraulic fracturing, completion and production; however, specific activities on these stages are not the focus of this report. Opportunities exist for direct users of feedstock and users of intermediary products.

Figure 1 presents the gas value chain as defined in this report, consisting of the following main stages: (1) gas extraction; (2) gas processing; and petrochemical industry consisting of (3) petrochemical manufacturing; and (4) plastic & resin manufacturing. Downstream from the (4) plastic & resin manufacturing are: (5) plastic, sheet & bag manufacturing; (6) plastic pipe & parts manufacturing; (7) laminated plastics manufacturing; (8) polystyrene foam manufacturing; (9) urethane foam manufacturing; and (10) plastic bottle manufacturing. Downstream from the (3) petrochemical manufacturing are: (11) soap & cleaning compound manufacturing; (12) textile mills. This stage (3) also provides inputs for the last three stages of the plastic & resin manufacturing stage, i.e., (7) polystyrene foam manufacturing; (8) urethane foam manufacturing; and (10) plastic bottle manufacturing.

Unless otherwise indicated, where available, market share refers to estimates for the U.S. region. For vertically integrated companies, with operations across multiple stages of the gas value chain, such as SINOPEC or Braskem, typically only one entry is made on the report. In these cases, however, the brief description about the company contains remarks about their operations across the various stages. The Appendix displays West Virginia chemical and polymer industry map developed by WV Department of Commerce. This map indicates the companies in the value chain that already have a presence in WV.
Fig 1 – Natural Gas Industry Value Chain

Source: Ednilson Bernardes, Ph.D.
2  Industry Value Chain and Representative Companies

| (1) Gas Extraction |

Companies in this stage of the value chain are upstream of cracking. They develop and operate gas field properties, extracting natural gas and gas liquids. These companies may operate gas wells on their own or for others on a contract or fee basis. While large firms are the main players in this stage, the market concentration is low. The four largest firms in the U.S. market account for little over 20% of the market.

BASF – ranked number 1 chemical company by sales worldwide, ICIS in 2017
The company operates in 5 segments: chemicals, performance products, functional materials, agricultural solutions, and oil and gas. It operates in this stage of the value chain through its subsidiary Wintershall. The Chemicals segment comprises basic chemicals and intermediates. Its portfolio ranges from solvents and plasticizers to high-volume monomers and glues as well as raw materials for detergents, plastics, textile fibers, paints and coatings, crop protection and medicines. It also supplies other BASF segments with chemicals for producing downstream products. In the Functional Materials & Solutions segment, it produces catalysts, battery materials, engineering plastics, polyurethane systems, automotive coatings, surface treatment solutions and concrete admixtures as well as construction systems like tile adhesives and decorative paints.

BASF SE
Carl-Bosch-Str. 38, 67056 Ludwigshafen, Germany
Tel.: +49 621 60-0
Fax: +49 621 60-42525
global.info@basf.com

SINOPEC China Petrochemical – ranked number 2 chemical company by sales worldwide, ICIS in 2017
According to the English version of its annual report, the main operations of the Sinopec Group include industrial investment and investment management; the exploration, production, storage and transportation (including pipeline transportation), sale and comprehensive utilization of petroleum and natural gas; the production, sale, storage and transportation of coal; oil refining; the storage, transportation, wholesale and retailing of oil products; the production, sale, storage, transportation of petrochemical products, natural gas chemicals, coal chemical products and other chemical products; the production, sale, storage and transportation of energy products such as new energy and geothermal energy; the exploration, design, consulting, construction and installation of petroleum and petrochemical engineering projects; the overhaul and maintenance of petroleum and petrochemical equipment; the production and sale of electricity and industrial gas.

http://www.sinopecgroup.com/group/en/
Sinopec U.S.A Office
515 Madison Ave, Suite 27 West
New York, NY 10022 U.S.A
Tel : 001-212-759-5085
Fax : 001-212-759-6882
Dow Chemical - ranked number 3 chemical company by sales worldwide, ICIS in 2017

In the production side, Dow Oil, Gas & Mining assist with R&D to develop more effective production chemistries necessary for today's ever changing and demanding oilfield challenges. The company continue to develop and introduce chemistries that achieve oilfield production success – meeting production targets and regulations, ensuring efficient flow assurance and maintaining asset integrity. In the refinery side, Dow offers a variety of products and services to help refineries meet regulatory specifications and keep operational costs low.

Phone: +1 989-636-1000 (Toll Free: +1 800-331-6451)
Fax: +1 989-832-1456

SABIC - ranked number 4 chemical company by sales worldwide, ICIS in 2017

SABIC is a global leader in diversified chemicals headquartered in Riyadh, Saudi Arabia. It produces on a global scale in the Americas, Europe, Middle East and Asia Pacific, making different kinds of products: chemicals, commodity and high performance plastics, agro-nutrients and metals. SABIC has converted crackers at UK plants to use shale gas as feedstock to produce olefins and their derivatives more competitively. The company plans to expand investment in US shale gas projects through joint ventures.

https://www.sabic.com/en
SABIC Americas Head Office
Corporate Office
Houston, TX ·
(713) 430-2300

INEOS - ranked number 5 chemical company by sales worldwide, ICIS in 2017

The company has extensive license interests across North and South Yorkshire, the East Midlands and Cheshire. In addition to gathering geological information through 2D and 3D imaging technology, INEOS is now also planning to carry out some exploration drilling,

https://www.ineos.com/businesses/ineos-shale/
+44 (0) 203 793 8066
shale.information@ineos.com

Braskem – ranked number 14 chemical company by sales worldwide, ICIS in 2017

It is an integrated petrochemical company operating from the extraction of raw material stage of the value chain, production of basic petrochemicals, thermoplastic resins to the plastics converters. Its production focuses on polyethylene (PE), polypropylene (PP) and polyvinylchloride (PVC) resins, in addition to basic chemical inputs such as ethylene, propylene, butadiene, benzene, toluene, chlorine, soda, and solvents, among others.

https://www.braskem.com.br/profile
Rua Lemos Monteiro, 120, 22º andar
Edifício Odebrecht São Paulo, Butantã
São Paulo, SP
CEP: 05501-050
Tel: 55 11 3576-9000; Fax: 55 11 3576-9073
**ConocoPhillips Company** – Estimated market share: 6.7%

In 2012, ConocoPhillips spun off its downstream and midstream businesses into the independent and publically traded company Phillips 66, focusing exclusively in exploration and production.

600 North Dairy Ashford (77079-1175)
P.O. Box 2197, Houston, TX 77252-2197
Tel: 281-293-1000

**BP PLC** – Estimated market share: 5.5%

BP PLC (BP) is a multinational oil and gas company headquartered in London. Most of the oil reserves it controls directly is located in the United States. Gaogiao Petrochemical Co. Ltd., a Shanghai-based, wholly owned subsidiary of China Petroleum & Chemical Corp. (Sinopec), has agreed to acquire BP PLC’s 50% stake in SECCO Petrochemical Co. Ltd. SECCO has ethylene cracking and polyethylene plants.

[https://www.bp.com/](https://www.bp.com/)
501 Westlake Park Blvd: Houston,
TX: 77079-2604. Phone:
Tel: 281-366-2000

**Exxon Mobil Corp** – Estimated market share: 5.4%

Exxon Mobil Chemical is ranked number 8 worldwide by sales, ICIS in 2017
ExxonMobil operates in three segments of the value chain: upstream, downstream and chemicals. ExxonMobil’s global upstream and chemical companies are headquartered in Houston. The company supplies crude oil and natural gas that it extracts to produce refined products in its petroleum-refining and chemical complexes, as well sells crude oil and natural gas in the international markets.

Corporate Headquarters
5959 Las Colinas Boulevard
Irving, Texas 75039-2298
Tel: 972-940-6000

**Petro China**
The company is involved in the exploration, development, production and sale of crude oil and natural gas. The business is also involved in the refining of crude oil and petroleum products, production and marketing of primary petrochemical products, derivative chemical products and other chemical products.

(86-10)59983285
Email: Mao Zefeng - hko@petrochina.com.hk
**Chevron Corp** – Estimated market share: 4.8%

Chevron concentrates its upstream activities in the United States in the Gulf of Mexico, California, Louisiana, Texas, New Mexico and the Rocky Mountains. In the Gulf area, it has interests in onshore Louisiana, as well as in shelf and major deep-water fields, including Genesis, Petronius and Typhoon. In California, production is concentrated in the San Joaquin Valley. Jointly, the Gulf and California account for nearly 70.0% of the company’s US oil production and about half its natural gas production.

https://www.chevron.com/
800 Mountain View
Smithfield, PA 15478
Tel: 724-564-3700

**Royal Dutch Shell PLC** – Estimated market share: 3.1%

Royal Dutch Shell is the leading oil and gas producer in the deep-water Gulf of Mexico and is an affiliate of the Royal Dutch/Shell Group. Its main operations are in the Gulf of Mexico, Texas, Wyoming and California. It operates in this stage of the chain through the Shell Exploration & Production Company (SEPCo), which has a majority holding in Aera Energy LLC, an exploration/production joint venture with ExxonMobil.

http://www.shell.com/
Carel van Bylandtlaan 16,
2596 HR The Hague,
The Netherlands
PO box 162, 2501 AN The Hague, The Netherlands
Tel. +31 70 377 9111

**Devon Energy Corp.** – Estimated market share: 1.6%

Devon Energy Corp., headquartered in Oklahoma City, is an independent natural gas and exploration company. The company’s operations are focused onshore in the United States and Canada. Most of its assets are located in the southern United States, with Texas making up the largest share of US assets.

http://www.devonenergy.com/
Corporate Headquarters
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015

**Hess Corp** – Estimated market share: 0.7%

Hess Corp. is headquartered in New York City. Formerly an integrated oil and gas company, Hess sold its downstream marketing and refining segments to Centrica PLC’s subsidiary Direct Energy.

http://www.hess.com/
Hess Corporate Headquarters
1185 Avenue of the Americas 40th Floor New York, NY 10036
Tel: 212-997-8500
Total
This French company is known for its exploration, development, production and marketing of oil and gas. The business is split into three sections in which it operates, these are: Upstream, Refining & Chemicals, Marketing & Services. The operations span the entire oil, gas and solar value chain, from exploration and production to processing and marketing.

https://www.total.com/en/group
Tour Coupole - 2 place Jean Millier 92078
Paris la Défense cedex, France
Phone: +33 (0)1 47 44 45 46

Gazprom
A Russian company involved with the geological exploration, production, transportation, storage, processing and marketing of gas and other hydrocarbons. It has the world's richest reserves of gas.

http://www.gazprom.com/
BOX 1255,
St. Petersburg, 190000,
Russian Federation
gazprom@gazprom.ru
+7 495 719-30-01

Rosneft
In the upstream stage, this Russian company produces gas in several dozen subsidiaries and joint ventures in Western and Eastern Siberia, Central Russia, in the Southern European part of Russia, the Far East, and in Vietnam and Venezuela. The company also has business in the downstream stages, to include gas processing and petrochemicals.

https://www.rosneft.com/
26/1, Sofiyskaya Embankment, 117997
Moscow, Russian Federation
postman@rosneft.ru
+7 (499) 517-88-99

Reliance Industries
It specializes in the exploration and production of oil and gas, petroleum refining and marketing textiles, retail and special economic zones. The company is also involved in the marketing of petrochemicals, polyester, plastics and chemicals.

http://www.ril.com/OurCompany/About.aspx
Corporate office
Reliance Industries Limited
Maker Chambers - IV
Nariman Point
Mumbai 400 021, India
+91-22-2278 5000
info@ril.com
Companies in this stage of the industry value chain separate natural gas liquids (NGLs) from natural gas. Raw natural gas arrives at processing facilities in a gaseous state, and processors clean the natural gas and extract liquid hydrocarbons including ethane, propane, butane, isobutene and natural gasoline. As the price of ethane has lowered, petroleum processors have invested substantially in expanding ethane crackers, which converts ethane to ethylene – an important feedstock for downstream manufacturing. While large firms operate in this space in the chain, the market concentration is low and there are many medium-sized operators. The four largest companies account for about 20% of the U.S. market. The placement of processing plants near gas extraction sites can minimize gas transportation costs.

**Enterprise Products Partners LP – estimated market share: 4.7%**

Enterprise Products Partners L.P. is a provider of midstream energy services to producers and consumers of natural gas, NGLs, refined products and petrochemicals. Its services include: natural gas gathering, treating, processing, transportation and storage; NGL transportation, fractionation, storage and import and export terminals; crude oil gathering, transportation, storage and terminals; petrochemical and refined products transportation, storage and terminals; and a marine transportation business that operates primarily on the United States inland and Intracoastal Waterway systems.

https://www.enterpriseproducts.com/
1100 Louisiana Street
Houston, TX 77002
P.O. Box 4324
Houston, TX 77210-4324
Tel: 713-381-6500 – Main

**Targa Resources Partners LP – estimated market share: 4.5%**

Targa is a major provider of midstream services that own, operate, acquire, and develop a diversified portfolio of complementary midstream energy assets. The company is primarily engaged in the business of: gathering, compressing, treating, processing, and selling natural gas; storing, fractionating, treating, transporting, and selling NGLs and NGL products, including services to LPG exporters; gathering, storing, and terminaling crude oil; storing, terminaling, and selling refined petroleum products.

http://www.targaresources.com/
811 Louisiana, Suite 2100
Houston, TX 77002
Tel: 713-584-1000
Fax: 713.584.1100
Exxon Mobil Corp – Estimated market share: 3.3%

ExxonMobil operates in three segments of the value chain: upstream, downstream and chemicals. ExxonMobil’s global upstream and chemical companies are headquartered in Houston. The company supplies crude oil and natural gas that it extracts to produce refined products in its petroleum-refining and chemical complexes, as well sells crude oil and natural gas in the international markets. It is in the process of building a multibillion-dollar cracker in Baytown, TX, to increase its production of ethylene.

http://corporate.exxonmobil.com/
Corporate Headquarters
5959 Las Colinas Boulevard
Irving, Texas 75039-2298
Tel: 972-940-6000

Williams Partners LP – estimated market share: 1%

Williams, including its assets held through Williams Partners L.P., is an energy infrastructure company focused on connecting North America’s hydrocarbon resource plays to growing markets for natural gas and natural gas liquids (NGLs). Williams owns and operates midstream gathering and processing assets, and interstate natural gas pipelines. Williams’ headquarters are located in Tulsa, Okla. Other major offices are in Houston, Pittsburgh and Salt Lake City.

http://co.williams.com/
One Williams Center
Tulsa, OK 74172
Tel: 800-945-5426

NOVA Chemicals Corporation – estimated Canadian market share: 18%

Nova operates three ethylene cracker plants. It shares one of these facilities in a 50-50 Joint Venture (JV) with Dow Chemicals Company. The company uses more than half of its ethylene production in making polyethylene and sells the rest of it through a network of pipelines. The company also manufactures various other chemicals, such as performance styrene polymers, polystyrene and other advanced resins used in packaging and product industries.

http://www.novachem.com/Pages/home.aspx
NOVA Chemicals Corporation
Head Office
1000 Seventh Avenue, S.W.
P.O. Box 2518
Calgary, Alberta, Canada T2P 5C6
Tel: 403-750-3600
DCP Midstream Partners, LP

DCP Midstream is one of the largest producers of NGLs and one of the largest natural gas processing companies in the U.S. The company gathers and/or process about 12 percent of the national gas supply.

http://www.dcpmidstream.com/

370 17th Street
Suite 2500
Denver, CO 80202
Tel: 303-595-3331

MPLX – MarkWest Energy Partners LP

MarkWest is engaged in the gathering, processing, and transportation of natural gas; the transportation, fractionation, storage and marketing of NGLs; and the gathering and transportation of crude oil. It was acquired by Marathon Petroleum MPLX LP. MPLX operates several natural gas gathering systems in six states. MPLX's natural gas processing complexes remove the heavier and more valuable hydrocarbon components from natural gas.

http://www.markwest.com/contact-us/
1515 Arapahoe Street
Tower 1, Suite 1600
Denver, CO 80202
Tel: 303-925-9200

Encana Corporation

Encana produces, transports and markets natural gas, oil and natural gas liquids (NGLs). Encana Oil & Gas (USA) Inc. is the US subsidiary of Encana Corporation and is headquartered in Denver.

https://www.encana.com/
Encana Corporation
500 Centre Street SE
PO Box 2850
Calgary, AB
T2P 2S5
Tel: 403-645-2000

Sinopec

This Chinese state-owned company’s key business activities include: production, marketing, storage, transportation of petrochemicals, natural gas chemicals, coal chemicals and other chemical products; exploration, design, consulting, construction and installation of petroleum and petrochemical engineering projects; and overhaul and maintenance of petroleum and petrochemical equipment.

Contact listed elsewhere in this report
EnLink Midstream LLC

EnLink provides integrated midstream services across natural gas, crude oil, condensate, and NGL commodities. EnLink operates in several top U.S. basins and is strategically focused on the core growth areas of the Permian’s Midland and Delaware basins, Oklahoma’s Midcontinent, and Louisiana’s Gulf Coast.

http://www.enlink.com/
1722 Routh St.
Suite 1300
Dallas, TX 75201
Tel: 214-953-9500
Fax: 214-953-9501

Western Gas Partners

Western Gas Partners, LP is a growth-oriented Delaware master limited partnership formed by Anadarko to own, operate, acquire and develop midstream energy assets. WES’s assets are located in East, West and South Texas, the Rocky Mountains (Colorado, Utah and Wyoming), North-Central Pennsylvania and the Mid-Continent (Kansas and Oklahoma), and WES is engaged in the business of gathering, processing, compressing, treating and transporting natural gas, condensate, natural gas liquids and crude oil for Anadarko, as well as third-party producers and customers.

http://www.westerngas.com/
Western Gas Partners, LP
Western Gas Equity Partners, LP
1201 Lake Robbins Drive
The Woodlands, Texas 77380
Tel: 832-636-6000
Fax: 832-636-6001

Shell Oil Co

Shell is a leading oil and gas producer in the deep-water Gulf of Mexico, a recognized pioneer in oil and gas exploration and production technology and one of America’s leading oil and natural gas producers, gasoline and natural gas marketers and petrochemical manufacturers.

Shell headquarters
Carel van Bylandtlaan 16,
2596 HR The Hague,
The Netherlands
PO box 162, 2501 AN The Hague, The Netherlands
Tel: +31 70 377 9111
Shell Chemical LP

The product portfolio includes ethylene oxide/ethylene glycols, higher olefins and derivatives, lower olefins and aromatics, phenol/acetone and nonene, and solvents, which are used in many consumer and industrial products and processes. The major U.S. manufacturing facilities are located in Alabama (Mobile), Louisiana (Norco and Geismar) and Texas (Deer Park).

Shell Chemicals
910 Louisiana Street
Houston
TX 77002-4916
Tel: 855-697-435

Devon Energy

Devon Energy Corporation is a leading independent oil and natural gas exploration and production company. Devon’s operations are focused onshore in the United States and Canada.

http://www.devonenergy.com/
Corporate Headquarters
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015

Energy Transfer Equity LP.

ETP owns and operates a geographically diverse portfolio of complementary natural gas midstream, intrastate and interstate transportation and storage assets; crude oil, natural gas liquids (NGL) and refined product transportation and terminalling assets; NGL fractionation; and various acquisition and marketing assets. ETP’s general partner is owned by Energy Transfer Equity, L.P.

http://www.energytransfer.com/
8111 Westchester Drive
Dallas, TX 75225
214-981-0700

Keyera Corp.

The company provides essential services to oil and gas producers in the Western Canada Sedimentary Basin, including NGL gathering and processing, fractionation, storage, transportation, logistics and marketing services. It also provides diluent logistics services for oil sands customers.

https://www.keyera.com
Keyera Corp.
2nd Floor, Sun Life Plaza West Tower
144 – 4th Avenue SW
Calgary, Alberta T2P 3N4
Tel: 403-205-8300
ONEOK, Inc.

ONEOK, Inc. is an energy midstream service providers, connecting supply basins with key market centers. It owns and operates natural gas liquids (NGL) systems and gathers, processes, stores, and transports natural gas. ONEOK’s operations include a 38,000-mile integrated network of NGL and natural gas pipelines, processing plants, fractionators and storage facilities in the Mid-Continent, Williston, Permian and Rocky Mountain regions.

http://www.oneok.com/
ONEOK Plaza
100 West Fifth Street
Tulsa, OK 74103
Tel: 918-588-7000

Meritage Midstream Services

Meritage Midstream provides oil and gas producers across North America with a full complement of midstream services. Current operations are focused in Wyoming’s Powder River Basin and in Western Canada’s Montney and Duvernay regions. Capabilities include natural gas gathering, compression, treating and processing; NGL treating, fractionation and transportation; crude oil gathering, handling and transportation; and handling produced and flowback water.

http://www.meritagemidstream.com/
1331 Seventeenth Street, Suite 1100
Denver, Colorado 80202
info@meritagemidstream.com
Tel: 303-551-8150
Fax: 303-551-8862

Navitas Midstream Partners LLC.

The company focuses on existing and emerging resource plays where it can offer a full slate of services, from wellhead to market. Through acquisitions and greenfield construction, its gas gathering and processing systems in the Permian Basin include more than 1,500 miles of natural gas gathering pipelines and four cryogenic processing plants.

https://www.navitas-midstream.com/
Main Branch
9303 New Trails Drive
Suite 400
The Woodlands, TX 77381
Tel: 832-463-4414
Paramount Resources

Paramount Resources Ltd. is an independent, intermediate Canadian energy company. The Company explores for, develops, produces, and markets natural gas, crude oil, and natural gas liquids in Alberta, British Columbia, Saskatchewan and the Northwest Territories.

http://www.paramountres.com/
J.H.T. (Jim) Riddell
President, CEO
Paramount Resources Ltd.
Suite 2800, 421 7 Avenue S.W.
Calgary, Alberta T2P 4K9
Tel: 403-290-3600

PennTex Midstream Partners LLC

PennTex owns and operates midstream energy infrastructure assets in North America. The company provides natural gas gathering and processing, and residue gas and natural gas liquids transportation services to producers in the Terryville Complex in northern Louisiana.

http://penntex.com/
CORPORATE HEADQUARTERS:
8111 Westchester Drive, Suite 600
Dallas, TX 75225
Tel: 214-981-0700
Fax: 214-981-0703

Phillips 66

At year-end 2015, Phillips 66 began operations at its new 100-Mbpd NGL fractionator at the company’s Sweeny complex in Old Ocean, Texas. Sweeny Fractionator One supplies purity ethane and LPG to the petrochemical industry and heating markets, and is supported by 250 mi of new pipelines and a multimillion-barrel storage cavern.

http://www.phillips66.com/
Phillips 66
P.O. Box 4428
Houston, TX 77210
Tel: 281-293-6600

Tall Oak Midstream LLC

The core capabilities of the company include: natural gas gathering, compression, treating and processing; crude oil gathering, storage and transportation; condensate and water handling.

http://www.talloakmidstream.com/
2575 Kelley Pointe Pkwy #340
Edmond, OK 73013
Tel: 405-888-5585
Williams Partners LP

The company participates in the natural gas midstream services sector. The company offers natural gas transportation, gathering, processing, storage and NGL fractionation services. The company primarily operates in the Gulf Coast, with significant fractionation and natural gas gathering resources located in the region.

http://investor.williams.com/
One Williams Center
Tulsa, OK 74172
Tel: 800-945-5426

Sasol Limited

The Company develops and commercializes technologies, and builds and operates facilities to produce a range of product streams, including liquid fuels, chemicals and low-carbon electricity. The Company’s operating business units include Mining and, Exploration and Production International. Its Strategic Business Units are energy, base chemicals, performance chemicals and group functions. The Company’s regional operating hubs include Southern Africa Operations and International Operations.

http://www.sasol.com/
Sasol Ltd
50 Katherine Street Sandton, Sandton
SANDTON 2196
South Africa
Tel: +27 114413111

Canadian Natural Resources Limited

The company operates natural gas in Canada, crude oil and natural gas in the U.S.

https://www.cnrl.com/about-cnq/corporate-profile.html
Canadian Natural Resources Limited
2100, 855 - 2 Street S.W.
Calgary, AB T2P 4J8
Telephone: (403) 517-6700
Facsimile: (403) 517-7350

Saudi Aramco

The Dhahran-based company has partnered with The Dow Chemical Company to launch a mixed feed steam cracker with a capacity to crack 85 million standard cubic feet per day of ethane at Sadara in Jubail Industrial City in 2016.

http://www.saudiaramco.com/en/home/about.html
P.O. Box 5000, Dhahran 31311, Saudi Arabia
Email: webmaster2@aramco.com
Companies in this stage of the industry value chain manufacture petrochemicals, which are chemicals derived from refined petroleum or liquid hydrocarbons. Key products include ethylene, propylene, butylene, benzene, toluene, styrene, xylene, ethyl benzene and cumene. These outputs are fundamental building blocks used in the production of a wide range of consumer and industrial products, automotive components and various durable and non-durable goods.

LyondellBasell Industries NV – estimated market share: 35.5%
Ranked number 7 chemical company worldwide by sales, ICIS in 2017

Headquartered in the Netherlands, LyondellBasell Industries NV was formed in 2007 from the merger of privately owned Lyondell Chemical Company and Basell Olefins, a joint venture between BASF and Royal Dutch Shell. By revenue, it is currently the seventh-largest chemical company in the world. The Company operates in five segments: Olefins and Polyolefins-Americas, Olefins and Polyolefins-Europe, Asia, International, Intermediates and Derivatives, Refining and Technology. The O&P-Americas segment produces and markets olefins and co-products, polyethylene and polypropylene. The O&P-EAI segment produces and markets olefins and co-products, polyethylene and polypropylene. LyondellBasell has focused its business on the manufacture of polymers targeting the automotive industry, and now believes the acquisition of A. Schulman will allow it to diversify its business into what it calls "high-growth end markets" like agriculture, electronics and appliances, and building and construction.

https://www.lyondellbasell.com/
LyondellBasell Industries NV
1221 McKinney St Ste 300
HOUSTON 77010-2036
United States
Tel: 713-309-7200

Chevron Phillips Chemical Company LLC – estimated market share: 13%

Chevron Phillips is headquartered in The Woodlands, Texas, a northern suburb of Houston, and is a major producer of ethylene, propylene, polyethylene, polypropylene, K-Resin(r) SBC, Ryton Polyphenylene sulfide (PPS), Alpha-olefins, Polyalphaolefins, aromatic compounds and a range of specialty chemicals.

http://www.cpchem.com/en-us/Pages/default.aspx
Headquarters
10001 Six Pines Drive
The Woodlands, TX 77380
832-813-4100
Ineos Group – estimated market share: 7.8%

Ranked number 5 chemical company by sales globally, ICIS in 2017
The company produces the raw materials that are essential in the manufacture of a wide variety of goods: from paints to plastics, textiles to technology, medicines to mobile phones - solvents used in the production of insulin and antibiotics; biofuels to improve the sustainability of modern transport; chlorine to purify drinking water; synthetic oils that help to reduce greenhouse gas emissions from road transportation; modern plastics to package, protect and preserve food & drink; materials to insulate houses, offices, electrical and telecommunications cables; products transformed into automotive parts, used in medical applications, mobile phones, and construction.

https://www.ineos.com/
INEOS Group AG, HQ
38 Hans Cres,
Knightsbridge,
London SW1X 0LZ, UK
Tel: +41 (0) 21 627 7040

DowDuPont Inc. – estimated market share: 4.8%
Ranked number 9 chemical company by sales globally, ICIS in 2017

Completed merger with The Dow Chemical effective 08/31/2017. The Company is driving innovations that extract value from material, polymer, chemical and biological science to help address many of the world’s most challenging problems, such as the need for fresh food, safer and more sustainable transportation, clean water, energy efficiency, more durable infrastructure, and increasing agricultural productivity.

https://www.dow.com/
2030 Dow Center
Midland, Mi 48674
Tel: +1 989-636-1000

Imperial Oil Ltd. – estimated Canadian market share: 16%

Imperial operates under three main segments: Upstream, Downstream and Chemical. In the chemical segment, it manufactures and markets products such as ethylene, benzene, aromatic and aliphatic solvents, plasticizer intermediaries and polyethylene resin.

http://www.imperialoil.ca/
AST Trust Company (Canada)
P.O. Box 700
Postal Station B
Montreal, Quebec
H3B 3K3
Tel: 416-682-3860
**Mitsubishi Chemical Holdings** - Ranked number 6 chemical company by sales globally, ICIS in 2017

The company operates in 4 major segments: performance products, chemicals, industrial gases, and healthcare. In its chemicals segment, it produces ethylene derivatives such as ethylene oxide and ethylene glycols; propylene derivatives such as acrylic acid and octanol; C4 derivatives such as 1,4-butanediol, GBL and NMP; and terephthalic acid which is made from paraxylene. It has Ethylene plants in Japan and provides olefins such as ethylene and propylene, and aromatics such as benzene and toluene to various derivative product plants and to other customers in and outside the industrial complex. The plants also supply utilities including electricity, steam and gas for all of our production sites. The Mizushima ethylene plant is owned by Asahi Kasei Mitsubishi Chemical Ethylene, which is jointly owned by Asahi Kasei and Mitsubishi Chemical.

New York Office - Mitsubishi Chemical Holdings America, Inc.
655 Third Avenue, 15th Floor
New York, New York 10017
Tel. 212-672-9400
Tel. +81-(0)3-6748-7200

**SUMITOMO Chemical** – Ranked number 13 chemical company by sales globally, ICIS in 2017

Its Petrochemicals & Plastics Sector provides chemical products that underpin a variety of industries. The products include synthetic resins such as polyethylene, polypropylene and polymethyl methacrylate resin, as well as raw materials for synthetic fibers and various industrial chemicals.

[https://www.sumitomo-chem.co.jp/english/company/](https://www.sumitomo-chem.co.jp/english/company/)
Head Office Tokyo
27-1, Shinkawa 2-chome
Chuo-Ku
Tokyo 104-8260 Japan
Tel: +81-3-5543-5500
Fax: +81-3-5543-5901
Companies in this stage of the industry value chain manufacture resins, plastic materials (i.e. polymers) and synthetic rubber. This includes thermosetting resins, thermoplastic resins and synthetic rubber. This stage of the chain is very fragmented, consequently presenting low levels of market concentration. Only one company has a U.S. market share greater than 5.0%

**The Dow Chemical Company** – Market share 6.2%
Ranked number 3 chemical company by sales globally, ICIS in 2017

The company produces more than 5,000 products in near 200 manufacturing facilities across the globe. Among the major product segments are electronic and specialty materials, coatings and infrastructure, health and agricultural sciences, performance systems, performance products, basic plastics, basic chemicals and hydrocarbons and energy.

[https://www.dow.com/](https://www.dow.com/)

2030 Dow Center
Midland, Mi 48674
Tel: +1 989-636-1000

**Wacker Chemie AG**

Among its major products are silicon rubbers, polymer products (e.g., ethylene vinyl acetate redispersible polymer powder), chemical materials, polysilicon and wafers for semiconductor industry.


Hauptverwaltung
Hanns-Seidel-Platz 4
81737 München
Germany
Tel: +49 89 6279-0

**Hexion Inc.**

The company focuses on thermoset resins. Hexion’s Epoxy, Phenolic and Coating Resins Division produces epoxy specialty resins, modifiers and curing agents serving the automotive, oilfield, electronics, architectural and industrial coatings, wind energy, paint, packaging, power generation and distribution, aerospace, rail, marine and construction industries. The Forest Products Division produces resins, adhesives, wax emulsions and ancillary products to the forest products industry.


180 E Broad St
Columbus, OH 43215
Tel: 614-986-2497
**Ente Nazionale Idrocarburi**

Eni S.p.A is an Italian multinational oil and gas company headquartered in Rome. It operates in the exploration, production, and refining of gas and oil, and is one of the major manufacturers of plastics and rubbers. The company operates in 73 countries across the world.

Head Office
Piazzale Enrico Mattei, 1 - 00144 Roma
+39 06 598 21
U.S. Branch: 646-264- 2250

**LG Chemicals**

Among the largest Korean chemical company, headquartered in Seoul, South Korea. It is a major manufacturer of petrochemicals, polyolefins, polyvinyl chloride, synthetic rubbers and specialty polymers. The company is also a major producer of IT & electronic materials, and batteries.

LG Twin Towers, 128, Yeoui-daero, Yeongdeungpo-gu, Seoul
82-2-3773-1114

**Lanxess**

Lanxess is a specialty chemicals’ company based in Cologne, Germany. The company was founded in 2004 as a spin-off of the chemicals division and parts of the polymers segment of Bayer AG. The core business is the development, manufacturing and marketing of plastics, rubbers, intermediates and specialty chemicals. Through the joint venture with Saudi Aramco, Lanxess is also a leading supplier of synthetic rubber.

Kennedyplatz 1
50569 Cologne
Phone: +49 221 8885 0

**Formosa Plastics Corporation**

A Taiwanese company that produces mainly polyvinyl chloride resins and intermediate plastic goods.

201 Tung Hwa North Road
Taipei, Taiwan, R. O. C.
886-2-27122211
Alpla

Alpla is based in Austria and is a large producer of plastic packaging products destined for the Western European market. The company’s presence is in 42 countries across the globe operating 162 plastic production plants. Among its range of products include tubes, caps, blow-molded bottles and injection molded parts among others. The company is building a new plant in Dayton, OH.

https://www.alpla.com/en
Mockenstrasse 34
6971 Hard
Austria

Borouge

Borouge started as a joint venture between Abu Dhabi National Oil and Borealis of Australia. Since its inception, the company runs two major production plants the Borouge Pte Ltd with its operations based in Singapore and Abu Dhabi Polymers Co. Ltd. The company is credited with production of numerous high end plastic products targeting markets in Middle East and Asia Pacific.

http://www.borouge.com/default.aspx
Borouge Tower,
Shaikh Khalifa Energy Complex
Corniche Road
P O Box 6925
Abu Dhabi, UAE
Tel: +971 2 708000
info@borouge.com

Chi Mei Corporation

One of the world's largest producers of ABS resin. Chief products include ABS resins, SAN resins, PS resins, MS resins, PC resins, PC/ABS resins, ASA resins, Q resins, PMMA resins, thermoplastic elastomers (TPE), high cis and low cis butadiene rubber (HBR/LBR), and styrene butadiene rubber (SSBR),

No.59-1, Sanjiazi, Rende Dist.
Tainan City 71702, Taiwan
TEL: +886-6-2663000.2665000
FAX: +886-6-2665555~7

Celanese

Celanese Corporation, also known as Hoechst Celanese, is a global technology and specialty materials company with its headquarters in Irving, Texas. The company is a major producer of acetyl products, which are intermediate chemicals for nearly all major industries, and is one of the world's largest producer of vinyl acetate monomer.

https://www.celanese.com/
222 W. Las Colinas Blvd. Suite 900, Irving, TX 75039 USA
Hanwha
Hanwha Group is one of the largest business conglomerate in South Korea. The company is present in various stages of the value chain and divisions include Hanwha Chemical, Hanwha Total Petrochemical and Hanwha Advanced Materials.


Contact information for the various divisions:

Kuraray
A Japanese company that produces plastics, fabrics, chemicals, elastomers among others.

http://www.kuraray.com/company/
Ote Center Building, 1-1-3, Otemachi, Chiyoda-ku,
Tokyo 100-8115, Japan
TEL +81-3-6701-1000  FAX +81-3-6701-1005

Mitsubishi Chemical
Part of the Mitsubishi Chemical Holdings Group, it produces chemicals, plastic molded and processed, carbon and carbon fibers, fibers and textiles, polymers, resins, high performance chemicals, among others. It is present in various downstream stages of the value chain.

https://www.m-chemical.co.jp/en/
1-1, Marunouchi 1-Chome, Chiyoda-ku
Tokyo 100-8251, Japan
[+81](0)3-6748-7300

Eastman Chemical Company
Eastman is a global specialty chemical company that produces a broad range of advanced materials, additives and functional products, specialty chemicals, and fibers.

https://www.eastman.com
1 (423) 229-2000

In addition to the companies listed above, Lyondell Basell, Exxon Mobil, SABIC, INEOS, BASF, Chevron Phillips, Bayer, which appear in this report in other stages of the value chain, are major manufacturers that also participate in the stage described in this section.
Companies in this stage of the industry value chain convert plastic resins into various films, sheets and bags. Industry products are used by manufacturers for packing and storing products, by retailers for transporting merchandise and by consumers for household purposes. This stage of the chain consists of a large number of small to midsize firms and the market concentration is low. The four largest companies account for little over 20% of the U.S. market.

**Berry Plastics Group Inc.** – Market share: 8.4%

The company produces plastic consumer packaging, nonwoven specialty materials and engineered materials. It operates in three segments: Health, Hygiene & Specialties; Consumer Packaging; and Engineered Materials.

P.O. Box 959
Evansville, IN USA 47706-0959
Tel: 812-424-2904

**Bemis Company Inc.** – Estimated market share: 6.1%

The company produces rigid plastic packaging for food, consumer products, medical and pharmaceutical companies. This company has expanded through acquisition of Brazilian and Chinese groups.

Bemis Corporate
One Neenah Center, 4th Floor
P.O. Box 669
Neenah, WI 54957-0669
Tel: 920-527-5000

**Sigma Plastics Group** – Estimated market share: 4.7%

The company produces extruded polyethylene film and bags.

1000 Page Ave
Lyndhurst, NJ 07071
Tel: 201-933-6000
Sealed Air Corporation – Estimated market share: 4.5%

The company produces range of food, protective and specialty packaging products.

https://sealedair.com/
2415 Cascade Pointe Boulevard
Charlotte, NC 28208
Tel: 980-221-3235

Printpack Inc. – Estimated market share: 1.0%

The company produces flexible and specialty rigid packaging and has expertise on flexographic and rotogravure printing.
http://www.printpack.com/
2800 Overlook Parkway, NE
Atlanta, GA 30339
Tel: 404-460-7000

Saudi Basic Industries Corporation – estimated global market share – 3%
Ranked number 4 chemical company by sales globally, ICIS in 2017

SABIC’s petrochemicals operations’ products include thermoplastic resins, film and sheet products and specialty compounds, as well as coatings for various downstream markets, such as automotive, aircraft, construction and healthcare industries. The polymers segment produces polyethylene and polypropylene.

https://www.sabic.com/en
PO Box 5101
Riyadh 11422, Saudi Arabia
Tel: +966 (011) 225 8000
Fax: +966 (011) 225 9000

Amcor Limited

Amcor’s flexibles division provides packaging for fresh food, processed food and tobacco, through three divisions: flexibles Europe and Americas, flexibles Asia Pacific and global tobacco packaging. The rigid plastics division produces PET containers used in markets such as food, beverage, pharmaceutical, personal care and household chemicals.

https://www.amcor.com/
Level 11, 60 City Road
Southbank, Victoria, Australia 3006
+61 3 9226 9000
**Inteplast Group**
The company has three divisions. Inteplast BOPP Films produces BOPP films in plants located in Lolita, TX, Gray Court, SC, Morristown, TN, and Lanoraie, Quebec. AmTopp Stretch Film is produced in four plants located in Lolita, TX, Houston, TX, Charlotte, NC and Phoenix, AZ. AmTopp Concentrates operates a compact and diversified color concentrates, additives, and compounds production facility.

http://www.inteplast.com/
9 Peach Tree Hill Road
Livingston, New Jersey 07039
T: 800.426.8677
F: 973.994.8028

**Dupont Industrial Films**
DuPont membrane and film products offer a unique combination of electrical, thermal, chemical and mechanical properties that withstand extreme temperatures and other demanding environments for a host of applications and processing techniques.


Contact information:
http://www.dupont.com/forms/contact-us.html

**Novolex**
Novolex manufactures and distributes plastic packaging products. It markets its products under the Hilex Poly brand name.

www.novolex.com
101 East Carolina Avenue
Hartsville, SC 29500
United States
843-857-4800

**Winpak**
Winpak Ltd. is based in Winnipeg, Manitoba, Canada. The company manufactures and distributes packaging materials and products that are used to protect perishable foods, beverages, and in health care applications.

http://www.winpak.com/
100 Saulteaux Crescent
Winnipeg MB R3J 3T3
Canada
Tel: (204) 889-1015
info@winpak.com
**Glad Products Company**
The Glad Products Company specializes in trash bags and plastic food storage containers.

[https://www.glad.com/](https://www.glad.com/)
1221 Broadway # A
Oakland, CA 94612

**Polyone Corporation**
PolyOne is a global provider of specialized polymer materials and services. PolyOne has operations in thermoplastic compounds, specialty polymer formulations, color and additive systems, thermoplastic resin distribution, and vinyl resins.

33587 Walker Road
Avon Lake, OH, United States, 44012
Tel: +1 440 930 1000
Companies in this stage of the industry value chain manufacture a range of plastic pipes, plastic fittings for plastic pipes and unlaminated plastic profile shapes, such as rods, tubes, plates and car parts. This stage of the chain consists of large national companies and mid-size and small local companies. The market concentration is low. The four largest companies account for about 25% of the U.S. market.

**J-M Manufacturing Company Inc.**  – Estimate market share: 13.4%

The company produces a wide array of high grade, high performance plastic pipe.  
5200 W Century Blvd  
Los Angeles, CA, 90045 United States  
Tel: 800-621-4404

**Advanced Drainage Systems Inc.**  – Estimate market share: 6.1%

The company produces corrugated high-density polyethylene pipe, polyvinyl chloride (PVC) pipe, and polypropylene (PP) pipe.  
3113 W Old Lincoln Way  
Wooster, OH 44691  
Tel: 330-264-4949

**Westlake Chemical Corp** – Estimate market share: 4.9%

The company produces industry-relevant pipe, profiles and fittings, the company also makes fence, deck, and window and door components from plastic.  
2801 Post Oak Blvd.  
Houston, TX 77056  
Tel: 713-960-9111
(7) Laminated Plastics Manufacturing

Companies in this stage of the industry value chain manufacture a range of laminated plastic shapes, plates, rods and sheets. The lamination process generally involves bonding or impregnating profiles with plastics resins and compressing them under heat. Laminated plastic products are used for interior and exterior motor vehicle parts, consumer appliances and construction projects. This stage of the chain consists of a few large companies and a wide range of mid-size and small local companies. The market concentration is low.

Saudi Basic Industries Corporation – Estimate market share: 25.9%
The company produces chemical, industrial polymer and fertilizers, including plastic resins, including laminated plastic films, plates and sheets used in the automotive, transportation, consumer electronics, healthcare, telecommunications and construction markets.

https://www.sabic.com/en
PO Box 5101
Riyadh 11422, Saudi Arabia
Tel: +966 (011) 225 8000

PolyOne Corporation – Estimate market share: 6.6%
The company produces specialty polymer formulations, color and additive systems, plastic sheet and packaging solutions and polymer distribution.

http://www.polyone.com/
470 Johnson Rd #200, Washington, PA 15301
Tel: 724-225-2220

Rochling Glastic Corporation
Produces engineered composite materials and components.

4321 Glenridge Road
Cleveland, OH 44121 USA
Tel: 216-486-0100

Wisonart International
The company produces high pressure laminates and engineered composite materials, including High Pressure Decorative Laminate for interior surfaces, Acrylic Solid Surface, Specialty adhesives, Quartz, Decorative Metals for vertical applications, Thermally Fused Laminate Panels (TFL) for interior surfaces.

https://www.wilsonart.com/
Wilsonart Americas
2501 Wilsonart Drive
P.O. Box 6110
Temple, Texas 76503-6110
Companies in this stage of the industry value chain produce a wide range of polystyrene foam products, including expanded polystyrene for food containers and cups; foam ice chests and other packaging; and insulation goods. The products from this stage are used by a wide range of downstream industries in the construction, manufacturing and hospitality sectors. Each product segment has its own set of firms and present their unique level of concentration. While some segments of the stage are highly concentrated (e.g., insulation and single-use food products such as cups), overall concentration the market is low.

**Dart Container Corporation** – Estimate market share: 6.6%
The company produces broad range of single-use products for food service, retail and food packaging industries, to include cups, containers, dinnerware and accessories.

https://www.dartcontainer.com/home/
Dart Container Corporation
500 Hogsback Road Mason, MI 48854 USA
Tel: 800-248-5960

**Reynolds Group Holdings Ltd.** – Estimate market share: 14.3%
The company produces consumer food, beverage and food service packaging products.
http://www.reynoldsgroupholdings.com/
148 Quay Street
Level Nine
Auckland, 1010
New Zealand

**DowDuPont Inc.** – Estimate market share: 4.4%
In this industry segment, the company produces the Styrofoam brand of insulation products. See contact information above.

**D&W Fine Pack LLC.** – Estimate market share: 4.0%
The company produces plastic products, such as container bases, lids and domes, straws, cutlery and platters for the foodservices, supermarket, industrial, consumer and food processors industries.

https://www.dwfinepack.com/
777 Mark Street
Wood Dale, IL 60191
Tel: 877-423-DWFP

**Synthos**
It manufacturers of polystyrene used for various foaming applications in the construction, automotive, and packaging industries.

www.synthosgroup.com
synthos-pl@synthosgroup.com; +48 33 844 18 21 - 25
Companies in this stage of the industry value chain manufacture plastic foam products. These products are used to insulate objects or reduce shock in bedding, packaging, seat cushioning, carpet cushioning, car interiors, fluid filtration systems, anti-noise and vibration systems in aircraft, medical devices and several consumer applications such as sponges, mops, paint brushes and cosmetic applicators. This stage of the chain is very fragmented and the level of market concentration is low.

The Dow Chemical Company – Estimate market share: 13%
In this stage of the industrial chain, the company produces polyurethane foam in its infrastructure solutions segment and performance materials and chemicals segment. See contact information above.

Huntsman Corporation – Estimate market share: 7.1%
The company produces polyurethane products used in the production of rigid and flexible foams, as well as coatings, adhesives, sealants and elastomers in its polyurethane segment – one of five. Its products serves the chemical, plastics, automotive, aviation, textile and footwear industries.

http://www.huntsman.com/corporate/a/Home
500 Huntsman Way
Salt Lake City, UT 84108

FXI Foamex Innovations – Estimate market share: 6.7%
The company produces flexible polyurethane and advanced polymer foam products.
http://fxi.com/
Rose Tree Corporate Center II
1400 North Providence Road
Suite 2000
Media, PA 19063-2076

Carpenter Co. – Estimate market share: 1.2%
The company produces polyurethane foam, chemicals and polyester fiber, as well as finished foam products, including bedding, carpet cushion and flexible foam packaging.
http://www.carpenter.com/
Corporate Office
Richmond, VA
Tel: 804-359-0800
Companies in this stage of the industry value chain manufacture an assortment of bottles from various plastic compounds based on their end use. This is a highly-capital intensive stage, where manufactures convert plastic resin into low-value bottles that are sold to beverage, food and chemical manufacturers to use as packaging for soft drinks, milk, condiments and household and automotive chemicals.

**The Dow Chemical Company** – Estimate market share: 6.2%
See description and contact information above.

**Wacker Chemie AG** – Estimate market share: 1.5%
Among the major products are silicon rubbers, polymer products (e.g., ethylene vinyl acetate redispersible polymer powder), chemical materials, polysilicon and wafers for semiconductor industry.


Hauptverwaltung
Hanns-Seidel-Platz 4
81737 München
Germany
Tel: +49 89 6279-0

**Hexion Inc.** – Estimate market share: 1.1%
The company focuses on thermoset resins. Hexion’s Epoxy, Phenolic and Coating Resins Division produces epoxy specialty resins, modifiers and curing agents serving the automotive, oilfield, electronics, architectural and industrial coatings, wind energy, paint, packaging, power generation and distribution, aerospace, rail, marine and construction industries. The Forest Products Division produces resins, adhesives, wax emulsions and ancillary products to the forest products industry.


180 E Broad St, Columbus, OH 43215
Tel: 614 986 2497

**Alpek**
The Polyester Business segment includes Purified terephthalic acid (PTA), Polyethylene Terephthalate (PET), and polyester fibers. The company operates in two business segments: polyester and plastics & chemicals.


5925 Carnegie Blvd., Suite 500. Charlotte, Carolina del Norte 28209, EEUU.
Tel. (704) 940-7500.
Companies in this stage of the industry value chain produce substances that loosen and remove soil from a surface for personal hygiene, sanitization or cleaning clothes, linens and furnishings.

SC Johnson & Son Inc. – Estimate market share: 9.6%
The company produces products for household cleaning, home storage, personal care and insect control.

1525 Howe Street
Racine, Wisconsin 53403-5011
USA

The Procter & Gamble Company – Estimate market share: 9.5%
Among others, the company produces fabric care products, such as laundry detergents, and home care products, such as dishwashing liquids, surface cleaners and air fresheners.

https://us.pg.com/
1 P&G Plaza
Cincinnati, OH 45202
Tel: 513-983-1100

Unilever PLC – Estimate market share: 4.4%
Among others, the company produces laundry products, surface cleaners and bleach.

https://www.unilever.com/
Unilever US, Inc
800 Sylvan Avenue
Englewood Cliffs
NJ 07632

Ecolab Inc – Estimate market share: 4.0%
The company produces cleaning and sanitizing, and pest elimination products, among others.

http://www.ecolab.com/
Ecolab Global Headquarters
1 Ecolab Place
St. Paul, MN 55102-2233
Tel: 800-352-5326
**Henkel Corporation** – Estimate market share: 3.9%
Among others, the company produces liquid detergents, liquid soaps and fabric softeners
https://www.henkel-northamerica.com/
2100 Stephenson Highway
Madison Heights, MI 48071
Tel: 248 583 9300

**Colgate-Palmolive Company** – Estimate market share: 3.3%
The company produces toothpaste, mouth rinses, hand soaps, shower gels, laundry and dishwashing detergents, household cleaners, bleaches and other similar items.
https://www.colgatepalmolive.com/en-us
300 Park Avenue
Colgate-Palmolive Company.
300 Park Avenue.
11th Floor.
New York, NY 10022-7499

**The Clorox Company** – Estimate market share: 3.3%
The company produces cleaning products, bleaches, water filters and food product.
https://www.thecloroxcompany.com/
1221 Broadway
Oakland, CA 94612
Tel: 510-271-7000
Companies in this stage of the industry value chain buy products, such as propylene and paraxylene, to be used in fiber manufacturing.

**TORAY Industries** - Ranked number 11 chemical company by sales globally, ICIS in 2017

In the segment of fibers and textiles, Toray product line encompasses all three major types of synthetic fibers: nylon, polyester and acrylic. The company supplies materials in many different forms, including filament yarns, staple fibers, textiles and garments. In the segment of carbon fiber composite materials, it manufacturers PAN-based carbon fibers. These materials in various forms are used in aerospace and many other applications. The company operates also in performance chemicals and life sciences, among others. Its US operations, Toray Industries (America), Inc., encompass a broad range of businesses, from specialty fibers, engineering plastic compounds, plastic films, foams, water treatment membranes to carbon fibers and composite materials. Toray is actively expanding its businesses in the U.S. under its ongoing “Project Action Plan for Growth 2016”. Major steps forward include expansion of Toray’s carbon fiber composite materials business through the recent acquisition of Zoltek and launch of a new plant in South Carolina.

Nihonbashi Mitsui Tower, 1-1,
Nihonbashi-Muromachi 2-chome,
Chuo-ku, Tokyo 103-8666, Japan
Tel: 03-3245-5111
Fax: 03-3245-5054
3 General Remarks

The construction of pipelines to transport NGLs to the Gulf Coast, Canada or China are good possibilities for the state; however, NGLs are commodities, so the state and the region lose the economic benefit of manufacturing activity to add value to the commodity. Life cycle analysis of the products manufactured by the chemical industry indicates that this industry is very energy intensive. This creates opportunities to produce not only feedstock, but high value petrochemical products in West Virginia powered by natural gas using innovative technologies, which can potentially reduce the global carbon footprint compared to producing elsewhere in the globe from higher emitting feedstock and more expensive energy sources. It is likely that the state needs to attract additional crackers to enable the development of a gas hub and to stimulate the use of feedstock within the state, as much of the projected capacity at this stage is likely to leave the region, via the Gulf Coast or gas swaps, towards international markets.

In addition, gas can potentially be used to power transportation within a petrochemical logistics cluster, so the state can leverage the reduced carbon footprint and costs to attract additional manufacturers – not only for a chemical industrial cluster, but from other complementary industrial sectors, such life sciences, automotive and aerospace. Logistics clusters become a natural location for adding value to products that pass through it, so they can strengthen the petrochemical cluster and further diversity the economic activity of the state. A logistics cluster focused on the petrochemical, but also serving other industries, can facilitate knowledge sharing, innovation, positive externalities of collaboration, and productivity improvement. A business model based on shared resources within the cluster can leverage economies of scale and reduce costs. It can also help the state deal with the challenges of limited land available for industrial use. A private-public partnership can potentially make such a project financially viable. There are also opportunities in strategically leveraging and expanding current research and expertise on gas-powered technology and new materials to make the region more attractive.

In summary, the business case to position the state as a competitive location can be based on potentially lower production costs due to cheap energy and feedstock, lower logistics costs in terms of shorter upstream supply chain, proximity to market and lower transportation costs, synergies with other industrial companies, access to research and technological development, shared logistics infrastructure, and access to qualified scientists, technical workers, supply chain, and manufacturing professionals. In addition, having assets and operations in the upstream stages of the value chain located in the region can reduce the risks associated with the concentration of assets and operations in only one location of the country, which increases potential for disruptions.
4 References

The official websites of the companies listed in this report.

American Chemistry council
American Petroleum Institute
ICIS – Reed Business Information
IHS Markit Ltd.
Chemical & Engineering News
IBISWorld
WVU Energy Institute
WV Development Office, Department of Commerce
U.S. Energy Information Administration
About the Bureau of Business and Economic Research

Since the 1940s, the BBER’s mission has been to serve the people of West Virginia by providing the state’s business and policymaking communities with reliable data and rigorous applied economic research and analysis that enables the state’s leaders to design better business practices and public policies. BBER research is disseminated through policy reports and briefs, through large public forums, and through traditional academic outlets. BBER researchers are widely quoted for their insightful research in state and regional news media. The BBER’s research and education/outreach efforts to public- and private-sector leaders are typically sponsored by various government and private-sector organizations.

The BBER has research expertise in the areas of public policy, health economics, energy economics, economic development, economic impact analysis, economic forecasting, tourism and leisure economics, and education policy, among others. The BBER has a full-time staff of three PhD economists and one master’s-level economist. This staff is augmented by PhD student research assistants. The BBER also collaborates with affiliated faculty from within the College of Business and Economics as well as from other parts of WVU.

To learn more about our research, please visit our website at http://www.be.wvu.edu/bber.