

Asia Petrochemical Industry Conference 2017

Country Report

From

Singapore

Prepared by:

Singapore Chemical Industry Council Limited (SCIC)

Asia Petrochemical Industry Conference 2017 Singapore

Country Report - Singapore

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Facts on Singapore

a. Land and Climate

Total Land Area:	715.8 sq km. Comprising one main island and a number of islets scattered off its north-east and south.
Climate:	Singapore is an equatorial country with relatively uniform temperature, high humidity and abundant rainfall.
Average Daily Temperature:	25.1 – 31 degree Celsius
Time:	GMT +8 Hours

b. People

Total Population: (2016)	5.6 million
Population Density: (2016)	7,797 per sq km
Population by Race:	Chinese (74.3%) Malays (13.4%) Indians (9.1%) Others (3.2%)
Official Languages:	English (Language of Administration) Chinese (Mandarin) Malay (National Language) Tamil

c. Government

Singapore is a republic with a parliamentary system of government based on the Westminster model.

The organs of state comprise:

The Executive: Head of State and Cabinet

Head of State: President Tony Tan Keng Yam, - elected in 2011
(The President is elected for a fixed term of 6 years)

Cabinet: Led by the Prime Minister, Mr Lee Hsien Loong
(since 12 Aug 2004)

Parliament

Parliament is elected by general election every five years. The first sitting of Parliament was held on 8 Dec 1965. The first general election for Parliament was held on 13 Apr 1968.

The Judiciary: The Supreme Court and the Subordinate Courts

The Judiciary is one of the three constitutional pillars of government along with the Legislature and the Executive. As an Organ of State, the Judiciary's function is to independently administer justice. The Judiciary is safeguarded by the Constitution.

d. Economic Indicators

Currency: Singapore Dollar (SGD) which is divided into 100 cents

Money Supply: \$160.45 billion (as of 2015)

Official Foreign Reserves: \$350.99 billion (as of 2015)

Overview of Singapore's Economy in 2016

Year	GDP at 2010 Market Prices (S\$ M)	% Growth
2012	354,937.3	3.7
2013	371,531.5	4.7
2014	383,643.6	3.3
2015	391,348.5	2.0
2016	402,159.8*	2.0*

Overview of Manufacturing Sector Performance in 2016

Year	Total Output (S\$ M)	% Growth
2012	300,702.8	5.3
2013	290,476.0	- 3.4
2014	303,889.0	4.6
2015	282,978.9	-6.8
2016	270,455.3*	-5.0*

** Figures are provisional at the time of printing. All statistics indicated above have been extracted from the Singapore Department of Statistics*

Overview of Chemical Cluster Performance in 2016

The Singapore chemical cluster comprises the Petroleum, Petrochemicals and Specialties sub-sectors.

The chemical industry's output in 2016 rose 4.1 per cent on a year-on-year basis.

The chemical cluster still continued being one of the key contributors within the manufacturing sector, contributing about 28.6 % to the overall manufacturing output in 2015.

Year	Chemical Cluster Output (S\$ Bn)	% Growth
2012	102.06	5
2013	97.11	- 4.9
2014	103	34.1
2015	81.04	-21.3
2016	69.61*	-15.1*

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Chemical Industry Sectoral Performance in 2016

Petroleum

Petroleum sector contributed an output of S\$25.48 billion in 2016 as compared to S\$32.91 billion in 2015 due to the low crude situation.

Petrochemicals

The petrochemicals sector contributed an output of S\$26.70 billion in 2016.

Specialties

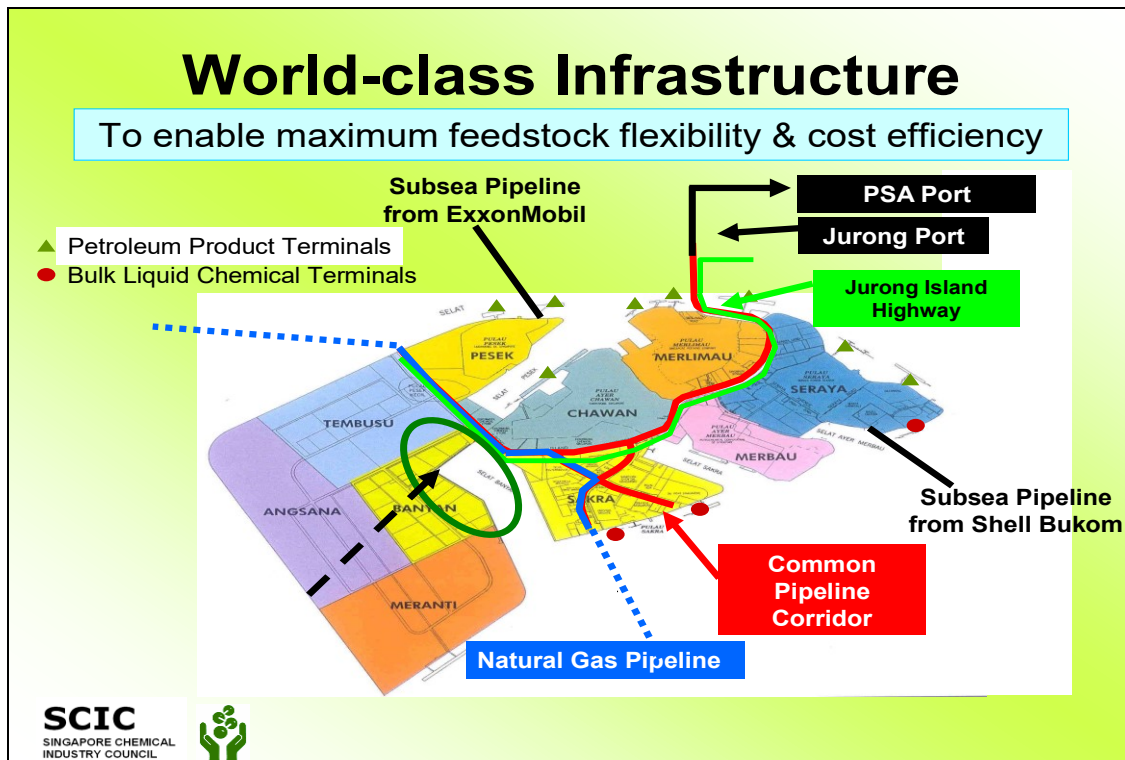
The specialties sector output is recorded as 4.1 per cent in 2016.

	2013	2014	2015	2016
	Value (S\$Bn)	Value (S\$Bn)	Value (S\$Bn)	Value (S\$Bn)
Petroleum Sector	51.32	46.48	32.91	25.48*
Petrochemical Sector	34.58	41.76	34.41	26.70*
Specialties Sector	9.37	9.92	9.46	9.46*

** Figures are provisional at the time of printing. All statistics indicated above have been extracted from the Singapore Department of Statistics*

Location of Petrochemical Plants in Singapore – Jurong Island

Jurong Island is located on the western coast of Singapore. It is home to leading petrochemical companies as well as third party service providers of utilities, tankages and terminalling facilities, warehouses, maintenance and repair centres.



Singapore firmly believes in the permanence of the outsourcing trend. Today, companies on Jurong Island are able to outsource non-core manufacturing operations like utilities, waste treatment, logistics and storage and terminalling. This translates to lowering of fixed capital investments by 10-15%, hence generating a better return on capital employed.

Jurong Island will be developed into a chemical transshipment centre for the region. 80 hectares of land has been designated for the logistics hub (Banyan Logistics Node) for the movement of bulk chemicals. Companies can also export bulk solids using Singapore's main port (PSA) which is less than 10 kilometres away.

Companies can also work with the Institute of Chemical Engineering & Sciences (ICES), located in Jurong Island itself, in areas ranging from basic chemical R&D (eg. catalysis) to process optimisation.

The Island is getting ready for the future with the Jurong Island Version 2.0 (Jlv2.0) initiative. As Singapore gears itself for the increasing global competition, Jlv2.0 is set to transform Singapore's petrochemicals hub with future-ready solutions. This initiative adopts a "whole-of-government" effort to enhance Jurong Island's competitiveness as well as sustainability by strengthening robustness of the current system, achieving a higher level of resource optimisation, and developing industrial optionality.

Key Developments in 2016/2017

The following are some developments that will further strengthen the growth of the Singapore chemical industry over the next few years:

- ExxonMobil

On 16 February 2017, ExxonMobil announced that it will be expanding its Singapore refinery to increase the production of base oil, which is used to manufacture lubricants. Construction is expected to start in the second quarter of this year, and is to be completed in 2019.

Extracted from Singapore EDB website

- Vopak

On 15 Jun 2016, Vopak Terminals officially opened South-east Asia's first independent refrigerated liquefied petroleum gas (LPG) facility at its Banyan Terminal on Jurong Island. It will provide Singapore's crackers with an alternative feedstock to naphtha. The 80,000cu m facility is an 80:20 partnership between Vopak and SK Gas International Pte Ltd.

Extracted from Singapore EDB website

- Afton Chemical

On 18 May 2016, US chemical firm Afton Chemical Corporation opened a US\$100m (S\$137m) lubricant additive manufacturing plant on Jurong Island, which is Afton's first greenfield manufacturing investment in 35 years. The new facility will produce key components used in Afton's engine oil additives to meet rising regional and global demand.

The plant will be Afton's hub for the Asia-Pacific region, and is central to the company's 'made in Asia for Asia' strategy, which is aimed at ensuring Afton provides its customers with real-time solutions conceived and built in the region, improving lead time and service capabilities for companies in Asia.

Extracted from Singapore EDB website

- Clariant

On 10 June 2015, Swiss specialty chemicals company Clariant unveiled its Consumer Care Competence Centre in Singapore. Situated at the

International Business Park, the centre is Clariant's fifth application development centre in Asia Pacific but its first to focus on sensorial testing for personal and home-care products.

The centre includes an application lab, and aims to better align its products with customers in the Asia Pacific region.

Extracted from Singapore EDB website

- **Celanese**

On 28 April 2015, New York-listed chemicals giant, Celanese Corporation, has begun construction of a vinyl acetate ethylene (VAE) emulsions production unit at its acetyls facility on Jurong Island.

The unit that is expected to begin production by mid-2016, will be the third VAE investment by Celanese in Asia. The Singapore plant will support not only the Southeast Asia market, but also other Asia Pacific countries including India, Australia and New Zealand.

Extracted from Singapore EDB website

- **Jurong Island Rock Cavern (JRC) Project**

Jurong Rock Cavern (JRC) is an innovative initiative driven by JTC to increase underground oil storage capacity on Jurong Island. JRC will comprise an oil storage complex to be built at subterranean depths beneath the seabed of Banyan Basin. Upon completion, the underground caverns will have a potential storage capacity of close to 3 million cubic metres catering specifically to liquid hydrocarbons like crude oil, condensates and diesel oil.

Phase 1 of the JRC consists of 8km of tunnels and 5 caverns housing a total of 9 storage galleries. The caverns were built using a technique that drills and blasts sedimentary rock. For greater stability, the inner walls were lined with rock bolts. Two of its access shafts and start-up tunnels have been completed in 2009 and the project is now moving on to the construction of the tunnels, caverns and associated facilities.

Phase 2 of the project will double the facility's storage capacity. GK-JCPL Consortium, a Jurong International partnership with French engineering firm Geostock, was awarded the contract to provide basic engineering design and construction management services for the Caverns and its associated facilities. Jurong International is

responsible for many of the heavy infrastructure and engineering projects associated with Jurong Island, including its initial formation via reclamation and joining together of seven islands.

The completion of the first two caverns will yield a capacity of 0.48 million m³. The entire facility with a capacity of 1.47 million m³ of oil storage space will be made available to the oil storage industry. At 27m high, 20m wide and 340m long, the caverns stand as tall as a 9-storey building.

The caverns provide strategic storage for better fuel security. It also gives Singapore a competitive advantage to attract more investors.

JRC is a milestone project for JTC and marks the next phase in the evolution of Singapore's petroleum and chemicals industry.

Note: Information extracted from JTC website

Jurong Rock Cavern

Competitive Storage Solution

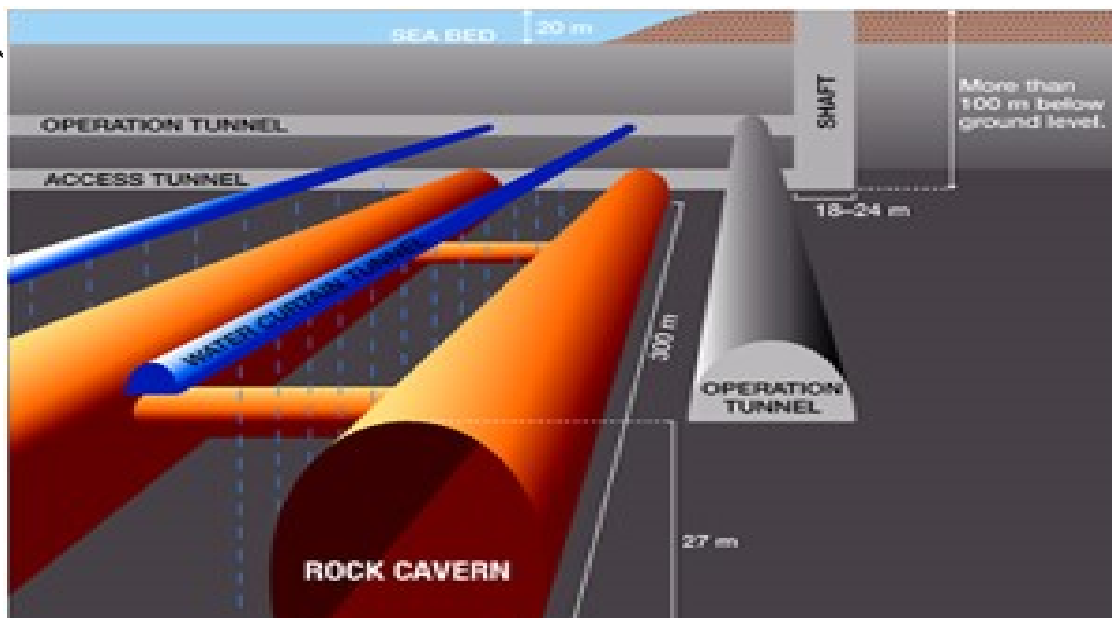


Proposed location for underground storage



- Ready built storage
- Greater security
- Increase opportunity for trade

SCIC
SINGAPORE CHEMICAL
INDUSTRY COUNCIL



General Matters and Raw Materials Committee

Production Capacities of Products

Product	Total Production Capacity (tpa)*
ETHYLENE	3,960,000
PROPYLENE	1,905,000
BUTADIENE	315,000
BENZENE	1,314,000
TOULENE	387,000
XYLENES	1,711,000

Total Import of Main Products by Value

PRODUCT	2016
	Value(\$K)
ETHYLENE	280,364
PROPYLENE	239,589
BUTADIENE	487
BENZENE	256,081
TOLUENE	36,419
XYLENES	136

Total Export of Main Products by Value

PRODUCT	2016
	Value(\$K)
ETHYLENE	283,500
PROPYLENE	5,435
BUTADIENE	30,315
BENZENE	142,842
TOLUENE	361,672
XYLENES	1,293,964

Total Import of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
ETHYLENE	186,566
PROPYLENE	234,275
BUTADIENE	52
BENZENE	292,065
TOLUENE	41,145
XYLENES	4

Total Export of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
ETHYLENE	210,033
PROPYLENE	5,357
BUTADIENE	45,035
BENZENE	138,060
TOLUENE	434,597
XYLENES	1,253

Import/export data indicated above have been generated from the reports by Statlink, IE Singapore

Polyolefins Committee

Production Capacities of Products

Product	Total Production Capacity (tpa)
POLYETHYLENE	980,000
POLYPROPYLENE	1,085,000

Total Import of Main Products by Value

PRODUCT	2016
	Value(\$K)
POLYETHYLENE	1,745,607
POLYPROPYLENE	550,913

Total Export of Main Products by Value

PRODUCT	2016
	Value(\$K)
POLYETHYLENE	2,930,093
POLYPROPYLENE	1,568,517

Total Import of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
POLYETHYLENE	1,114,527
POLYPROPYLENE	400,866

Total Export of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
POLYETHYLENE	1,743,279
POLYPROPYLENE	958,974

Import/export data indicated above have been generated from the reports by Statlink, IE Singapore

Styrenics Committee

Production Capacities of Products

Product	Total Production Capacity (tpa)
STYRENE	1,570,000

Total Import of Main Products by Value

PRODUCT	2016
	Value(\$K)
STYRENE	351
POLYSTYRENE	13,695

Total Export of Main Products by Value

PRODUCT	2016
	Value(\$K)
STYRENE	827,882
POLYSTYRENE	57,945

Total Import of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
STYRENE	193
POLYSTYRENE	5,229

Total Export of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
STYRENE	595,150
POLYSTYRENE	34,698

Import/export data indicated above have been generated from the reports by Statlink, IE Singapore

Synthetic Fiber Raw Materials Committee

Production Capacities of Products

Product	Total Production Capacity (tpa)
ETHYLENE GLYCOL	1,030,000
ETHYLENE OXIDE	210,000

Total Import of Main Products by Value

PRODUCT	2016
	Value(\$K)
ETHYLENE GLYCOL	20,972
ETHYLENE OXIDE	1,572

Total Export of Main Products by Value

PRODUCT	2016
	Value(\$K)
ETHYLENE GLYCOL	507,620
ETHYLENE OXIDE	12

Total Import of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
ETHYLENE GLYCOL	15,375
ETHYLENE OXIDE	263,882

Total Export of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
ETHYLENE GLYCOL	556,965
ETHYLENE OXIDE	170

Import/export data indicated above have been generated from the reports by Statlink, IE Singapore

Chemicals Committee

Production Capacities of Products

Product	Total Production Capacity (tpa)
ACETONE	108,000
ACETYLENE	693,500
PHENOL	180,000
BISPHENOL – A	230,000

Total Import of Main Products by Value

PRODUCT	2016
	Value(\$K)
ACETONE	6,935
ACETYLENE	1,151
PHENOL	7,088
BISPHENOL – A	6,742

Total Export of Main Products by Value

PRODUCT	2016
	Value(\$K)
ACETONE	113,163
ACETYLENE	1,332
PHENOL	152,066
BISPHENOL – A	122,541

Total Import of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
ACETONE	8,388
ACETYLENE	30,663
PHENOL	6,012
BISPHENOL – A	1,106

Total Export of Main Products by Quantity

PRODUCT	2016
	Qty (Tons)
ACETONE	155,761
ACETYLENE	429,571
PHENOL	141,438
BISPHENOL – A	87,028

Import/export data indicated above have been generated from the reports by Statlink, IE Singapore

About the Singapore Chemical Industry Council Limited

The Singapore Chemical Industry Council, or SCIC, is the official body representing companies from the chemical industry in Singapore. Its membership composition comprises key MNCs, SMEs, Logistics & Service Providers as well as Traders.

SCIC was officially formed under the umbrella of the former Singapore Manufacturers Association on 8th May 1979 by a group of 17 manufacturers. It was incorporated as an independent entity on 28 June 2007.

SCIC was appointed in April 2011 by SPRING Singapore - National Standards body to manage the National Chemical Standards committee & its technical committees

SCIC is also the national administrator of the Responsible Care initiative, endorsed by the International Council of Chemical Associations, to promote the spirit, principles and practices of Responsible Care to the Singapore Chemical Industry.

Through advocating Responsible Care, the chemical industry in Singapore can make a valuable contribution to the sustainable development and improvement of lives and the environment.