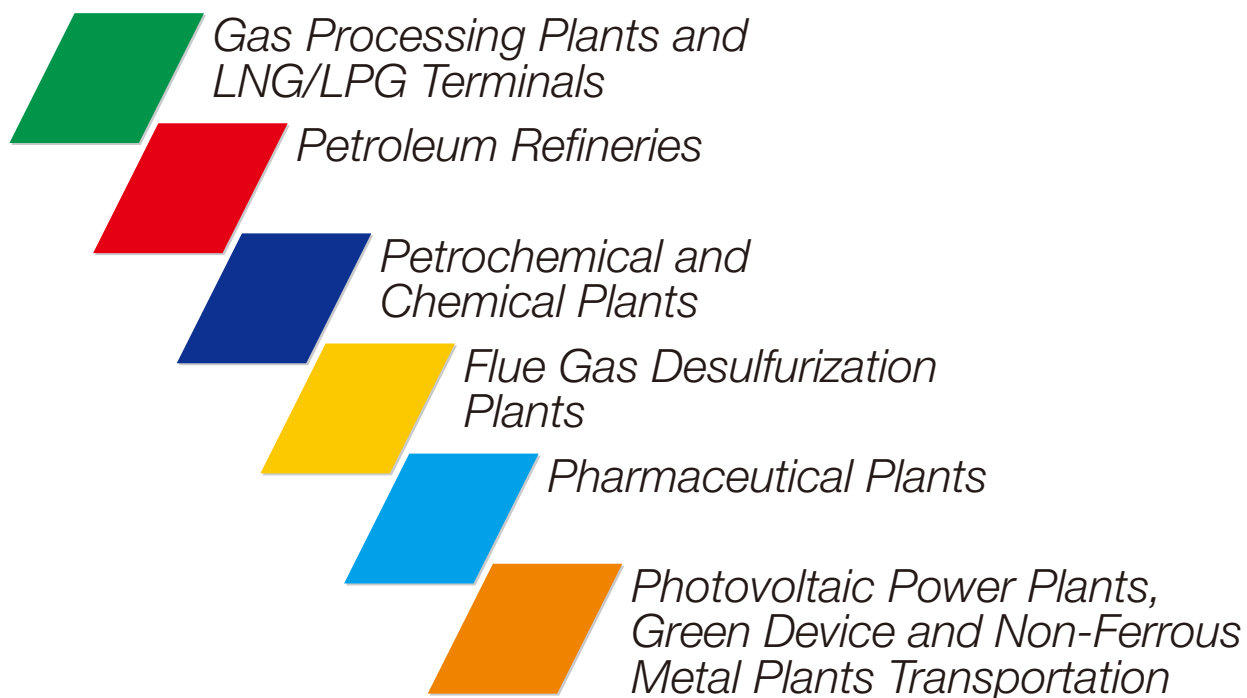


# MAJOR PROJECTS

on



as of December 2017

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# Gas Processing Plants and LNG/LPG Terminals



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<b>Scope of Work</b>	FEED: Front End Engineering Design
	PS: Project Specification
	FS: Feasibility Study
	B: Basic Design
	E: Engineering
	P: Procurement
	C: Construction
	CS: Construction Supervision
	M: Start-up and Commissioning
	T: Training

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# Gas Processing Plants

(for Hydrogen Manufacturing Units please see page 30~31, for Synthesis Gas / Fertilizers please see page 61~63)

Client	Type of Plant	Capacity (T/Y)	Location	Scope of Work	Year of Completion
Kharg Chemical Co., Ltd.	LPG/Sulfur Plant	LPG 200,000 Sulfur 200,000 NGL 20,000	Kharg Is., Iran	E.P.C.	1969
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	LNG/LPG Plant Train 1 & 2	LNG 1,100,000 x 2 LPG 544,000 x 2 NGL 110,000 x 2	Das Is., U.A.E.	B.E.P.C.	1976
State Organization for Oil Projects (SCOP)	Dew Point Control Plant	Sales Gas 194MM SCFD NGL 180,000	North Rumalia & Nassiriyah, Iraq	E.P.C.	1977
Qatar General Petroleum Corp. (QGPC)	LPG/NGL Recovery Plant	LPG 660,000 NGL 300,000	Umm Said, Qatar	E.P.C.M.	1980
China National Technical Import Corp. (CNTIC)	Natural Gas Treating Plant	4,000,000M <sup>3</sup> /D	Chongqing, China	B.E.P.CS.M.T.	1981
State Organization for Oil Projects (SCOP)	NGL Recovery Plant	Sales Gas 495MM SCFD NGL (C <sub>3</sub> <sup>+</sup> ) 1,950,000	North Rumaila, Iraq	B.E.P.C.M.T.	1983
Mobil Research and Development Corp.	C <sub>3</sub> & C <sub>4</sub> Extraction Plant	664MM SCFD	Indonesia	Bid Package Preparation	1983
Teikoku Oil Co., Ltd.	Natural Gas Purification Plant	Sales Gas 55MM SCFD NGL 60,000	Niigata, Japan	B.E.P.C.M.	1984
PERTAMINA	LPG Extraction Plant	450,000	Bontang, Indonesia	B.E.P.C.M.	1988
PERTAMINA	LNG/LPG Plant (Train E)	LNG 2,300,000	Bontang, Indonesia	E.P.C.M.	1989
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	LNG/LPG Plant (3rd Train)	LNG 2,500,000	Das Is., U.A.E.	FEED	1991
PERTAMINA	LNG/LPG Plant (Train F)	LNG 2,300,000	Bontang, Indonesia	E.P.C.M.	1993
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	LNG/LPG Plant (Train 3)	LNG 2,500,000 LPG 460,000	Das Is., U.A.E.	E.P.C.M.	1994
Ras Laffan Liquefied Natural Gas Co., Ltd. (RasGas)	Offshore Facilities	1,000MM SCFD	Offshore Ras Laffan, Qatar	E.P.C.M.	1999
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	BOG Recovery & LPG Capture Maximization	—	Das Is., U.A.E.	FEED	2000
PERTAMINA	LNG/LPG Plant (Train I)	LNG 2,950,000 LPG 83,000	Bontang, Indonesia	FEED	2001
Ras Laffan Liquefied Natural Gas Co., Ltd. (RasGas)	NGL Plant	740 x 2 MM SCFD		FEED	2002
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	LPG Plant	1,400,000	Das Is., U.A.E.	FEED	2002
PT. Badak Natural Gas Liquefaction	Modernization of Control system	—	Bontang, Indonesia	B.E.P.C.M.	2002
PetroChina International Jabung Ltd.	Gas Processing Plant	Sales Gas 100 MMSCFD LPG 15,200BPSD Condensate 9,930BPSD	Jambi, Indonesia	E.P.C.	2005
ExxonMobil Middle East Gas Marketing Ltd.	Gas Pre-treating Plant NGL Recovery Plant Fractionation Plant	750 MM SCFD 750 MM SCFD C <sub>2</sub> 180T/H C <sub>3</sub> 99T/H C <sub>4</sub> 54T/H	Ras Laffan, Qatar	E.P.C.M.T.	2005
ExxonMobil Barzan Limited	Gas Processing Plant	850MM SCFD x 2	Ras Laffan, Qatar	FEED	2009
ExxonMobil Middle East Gas Marketing Ltd.	Gas Pre-treating Plant	1,500 MM SCFD	Ras Laffan, Qatar	E.P.C.	2010

Client	Type of Plant	Capacity (T/Y)	Location	Scope of Work	Year of Completion
ExxonMobil Barzan Limited	Gas Processing Plant	950 MM SCFD x 2	Ras Laffan, Qatar	FEED	2010
Basrah Gas Company	NGL Plant Train 1	Sales Gas, NGL 530 MM SCFD	Ar Ratawi, Iraq	B	2014

#### GTL/DME

JFE Holdings, Inc.	DME Plant	—		FEED	2003
Qatar Shell GTL Limited	Feed Gas Preparation	800 MM SCFD x 2 (equivalent to 8MMTPA of LNG)	Ras Laffan, Qatar	E.P.C.	2011

#### Gas Related Infrastructure

Qatar Petroleum	Common Cooling Water System	300,000M <sup>3</sup> /h	Ras Laffan, Qatar	E.P.C.M.	2003
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#### Flow Assurance

RasGas Company Limited	Onshore Storage, Pumping and Loading Facilities	—	Ras Laffan, Qatar	E.P.C.	2015
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# LNG Plant (FEED/PS)

Client	Capacity (MMTY)	Project	Location	Scope of Work	Year of Completion
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	2.5	Train 3	Das Is., Abu Dhabi, U.A.E.	FEED	1991
Nigeria LNG Ltd.	2.65 x 2	Train 1 & 2	Bonny Is., Nigeria	PS (Rewriting)	1994
Ras Laffan Liquefied Natural Gas Co., Ltd. (RasGas)	2.5 x 2	Train 1 & 2	Ras Laffan, Qatar	FEED	1994
Amoco Trinidad LNG Co.	3.0	Train 1	La Brea, Trinidad and Tobago	FEED	1995
Ras Laffan Liquefied Natural Gas Co., Ltd. (RasGas)	4.4 x 2	Train 3 & 4	Ras Laffan, Qatar	FEED	2000
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	—	BOG Recovery & LPG Capture Maximization	Das Is., Abu Dhabi, U.A.E.	FEED	2000
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	—	Sulfur Recovery Upgrade	Das Is., Abu Dhabi, U.A.E.	FEED	2001
PERTAMINA / BP Berau, Ltd.	3.3 x 2	Train 1 & 2	Tangguh, Indonesia	FEED	2001
Shell Global Solutions International B.V.	4.8 x 2	Train 1 & 2	Prigorodnoye, Sakhalin Is., Russia	PS	2001
Shell Global Solutions International B.V.	3.3	Train 3	Qalhat, Oman	FEED	2001
Union Fenosa Gas S.A.	4.85 x 2	Train 1 & 2	Damietta, Egypt	FEED	2001
PERTAMINA	2.95	Train-I	Bontang, Indonesia	FEED	2001
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II)	7.8	Train 4	Ras Laffan, Qatar	FEED	2004
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II)	7.8	Train 5	Ras Laffan, Qatar	FEED	2004
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II)	4.7	Train 5	Ras Laffan, Qatar	FEED	2004
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3)	7.8	Train 6	Ras Laffan, Qatar	FEED	2004
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3)	7.8	Train 7	Ras Laffan, Qatar	FEED	2004
Qatar Petroleum & Conocophillips Qatar Ltd.	7.8	Train 6 & 7	Ras Laffan, Qatar	FEED	2005
Nigeria LNG Ltd.	8.5	Train 7+	Bonny Is., Nigeria	PS	2006
ExxonMobil	3.15 x 2	PNG LNG (APCI)	Port Moresby, Papua New Guinea	FEED	2009
Inpex Browse Ltd.	4.2 x 2	Ichthys Gas Field Development Onshore Facilities	Darwin, Northern Territory, Australia	FEED	2011
Arrow Energy Pty Ltd. (Operator)	4.0 x 2	LNG	Curtis Island, Australia	FEED	2012
Woodside Energy Ltd.	4.0 x 3	Browse LNG	James Price Point, Australia	FEED	2012
JSC Yamal LNG	5.5 x 3	Train 1-3	Yamal Peninsula, Russia	FEED	2013
PETRONAS	3.6	Train 9	Bintulu, Sarawak, Malaysia	FEED	2013
Anadarko Mozambique Area 1, Limitada	6.0 x 4	Train 1-4	Cabo Delgado, Mozambique	FEED	2015
BP Berau Ltd.	3.8	Train 3	West Papua, Indonesia	FEED	2016
LNG Canada Development Inc.	6.0 x 2	LNG Canada Project	Kitimat, BC, Canada	FEED	(Undisclosed)
Golden Pass Products, LLC	5.2 x 3	Golden Pass LNG Export Project	Sabine Pass, Texas, U.S.A.	FEED	(Undisclosed)
Sakhalin Energy Investment Co., Ltd.	4.8	Train 3	Sakhalin Island	FEED	2016
Freeport LNG Expansion, L.P.	4.64	Train 4	Freeport, Texas, U.S.A.	FEED	(2018)

# LNG Plant (EPC)

Client	Capacity (MMTY)	Project	Location	Scope of Work	Year of Completion
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	1.1 x 2	Train 1 & 2	Das Is., Abu Dhabi, U.A.E.	B.E.P.C.	1976
Perusahaan Pertambangan Minyak Dan Gas Bumi Negara (PERTAMINA)	1.75 x 2	Train C & D	Bontang, Indonesia	CS.	1983
Perusahaan Pertambangan Minyak Dan Gas Bumi Negara (PERTAMINA)	1.75 x 2	Train 4 & 5	Arun, Indonesia	B.E.P.C.M.	1984
Perusahaan Pertambangan Minyak Dan Gas Bumi Negara (PERTAMINA)	2.3	Train E	Bontang, Indonesia	E.P.C.M.	1989
Perusahaan Pertambangan Minyak Dan Gas Bumi Negara (PERTAMINA)	2.3	Train F	Bontang, Indonesia	E.P.C.M.	1993
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	2.3	Train 3	Das Is., Abu Dhabi, U.A.E.	E.P.C.M.	1994
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	2.0 x 2	Train 1 & 2	Ras Laffan, Qatar	E.P.C.M.	1996
Perusahaan Pertambangan Minyak Dan Gas Bumi Negara (PERTAMINA)	2.3	Train G	Bontang, Indonesia	E.P.C.M.	1997
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	2.0	Train 3	Ras Laffan, Qatar	E.P.C.M.	1998
Perusahaan Pertambangan Minyak Dan Gas Bumi Negara (PERTAMINA)		No.3 Loading Dock	Bontang, Indonesia	E.P.C .	1999
Oman LNG L.L.C.	3.3 x 2	Train 1 & 2	Qalhat, Oman	E.P.C.M.	2000
PT. Badak Natural Gas Liquefaction		DCS Retrofit & Instrumentation Upgrade	Bontang, Indonesia	E.P.C.M.	2002
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II)	4.7	Train 3	Ras Laffan, Qatar	E.P.C.M.	2003
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	3	Train 1, 2 & 3, Debottlenecking	Ras Laffan, Qatar	E.P.C.	2005
Qalhat LNG S.A.O.C.	3.3	Qalhat Train	Qalhat, Oman	E.P.C.M.	2005
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II)	4.7	Train 4	Ras Laffan, Qatar	E.P.C.	2005
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II)	4.7	Train 5	Ras Laffan, Qatar	E.P.C.	2006
Sakhalin Energy Investment Co., Ltd.	4.8 x 2	Train 1 & 2	Sakhalin Island, Russia	E.P.C.M.	2008
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II)	7.8	Train 4	Ras Laffan, Qatar	E.P.C	2008
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II)	7.8	Train 5	Ras Laffan, Qatar	E.P.C	2009
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3)	7.8	Train 6	Ras Laffan, Qatar	E.P.C.	2009
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3)	7.8	Train 7	Ras Laffan, Qatar	E.P.C.	2009
Qatar Liquefied Gas Co., Ltd. (3) (QATARGAS 3)	7.8	Train 6	Ras Laffan, Qatar	E.P.C.	2010
Qatar Liquefied Gas Co., Ltd. (4) (QATARGAS 4)	7.8	Train 7	Ras Laffan, Qatar	E.P.C.	2010
ExxonMobil PNG Limited	3.45	Train 1	Port Moresby, Papua New Guinea	E.P.C.	2013
ExxonMobil PNG Limited	3.45	Train 2	Port Moresby, Papua New Guinea	E.P.C.	2014
Sonatrach	4.7	GNL-3Z	Arzew, Algeria	E.P.C.M.	2015
INPEX Operations Australia Pty Ltd.	4.45 x 2	Ichthys Onshore LNG Facilities Project	Darwin, Australia	E.P.C.	(2018)

Client	Capacity (MMTY)	Project	Location	Scope of Work	Year of Completion
Sakhalin Energy Investment Co., Ltd.	4.8 x 2	Train 1, 2	Sakhalin Island, Russia	E.	(2022)
FLNG Liquefaction, LLC / FLNG Liquefaction 2, LLC (Operator)	Nominal 4.64 x 2	Freeport LNG Export Project	Freeport, Texas, U.S.A.	E.P.C.	(Undisclosable)
Cameron LNG, LLC	4.5 x 3	Cameron Liquefaction Project	Hackberry, Louisiana, U.S.A.	E.P.C.	(Undisclosable)
FLNG Liquefaction 3, LLC	Nominal 4.64 x 1	Freeport LNG Export Project Train 3	Freeport, Texas, U.S.A.	E.P.C.	(Undisclosable)
JSC Yamal LNG	5.5 x 3	Yamal LNG Project	Sabetta, Yamal-Nenets, Russia	E.P.C.	(2019)
BP Berau Ltd.	3.8	Train 3	West Papua, Indonesia	E.P.C.	(2020)

## Floating (FLNG/FPU)

Client	Capacity (MMTY)	Project	Location	Scope of Service	Year of Completion
<b>Floating Liquefaction Natural Gas (FLNG)</b>					
Petrobras Netherlands B.V.	2.7	FLNG	Santos Basin, Brazil	FEED	2010
Petrobras Netherlands B.V.	2.7	FLNG	Santos Basin, Brazil	Pre- EPC	2011
ExxonMobil Affiliate	> 6.0	FLNG	Offshore Western, Australia	Pre- FEED	2013
INPEX Masela Ltd.	2.5	FLNG	Abadi Gas Field, Indonesia	FEED	2014
ExxonMobil Affiliate	> 6.0	FLNG	Offshore Western, Australia	Optimization Study	2015
Eni East Africa S.p.A.	2.5	FLNG	Offshore Mozambique Area 4, Mozambique	FEED	2015
ExxonMobil Affiliate	3.0 – 5.0	FLNG	Offshore Western, Australia	Pre- FEED	2016, 2017

### Floating Production Unit (FPU)

ENI Muara Bakau B.V.	150 x 3 MMSCFD	FPU	Jangkrik Gas Field, Indonesia	FEED	2013
ENI Muara Bakau B.V.	150 x 3 MMSCFD	FPU	Jangkrik Gas Field, Indonesia	E. P. C. I.	2017

## Helium Recovery Unit

Client	Capacity (MMTY)	Project	Location	Scope of Service	Year of Completion
RasGas Company Ltd.	—	Helium2	Ras Laffan, Qatar	E.P.C	2013
Qatargas Operating Company Ltd.	—	Helium2	Ras Laffan, Qatar	E.P.C	2013
RasGas Company Ltd.	—	Helium3	Ras Laffan, Qatar	E.P.C	(2018)



# Acid Gas Removal

Client	Process	Location	Scope of Work	Year of Completion
Kharg Chemical Co., Ltd.	DEA	Kharg Is., Iran	E.P.C.	1969
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS) (Train 1 & 2)	Benfield Hi-Pure	Das Is., Abu Dhabi	B.E.P.C.	1976
Qatar General Petroleum Corp.	ADIP	Umm Said, Qatar	E.P.C.	1980
China National Technical Import Corp. (CNTIC)	Sulfinol	Chongqing, China	B.E.P.CS.M.T.	1981
Pertamina (Train 4 & 5)	Benfield Hi-Pure	Arun, Indonesia	E.P.C.M.	1983
Pertamina (Train E)	aMDEA	Bontang, Indonesia	E.P.C.M.	1989
Oil & Natural Gas Commission	Sulfinol	Uran, India	B.E.	1990
Pertamina (Train F)	aMDEA	Bontang, Indonesia	E.P.C.M.	1993
Nigeria LNG Ltd.		Bonny Is., Nigeria	PS	1994
Ras Laffan Liquefied Natural Gas Co., Ltd. (RasGas) (Train 1 & 2)	Sulfinol	Ras Laffan, Qatar	FEED	1994
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS) (Train 3)	Benfield Hi-Pure	Das Is., Abu Dhabi	E.P.C.M.	1994
Amoco Trinidad LNG Co., Ltd.		La Brea, Trinidad and Tobago	FEED	1995
Qatar Liquefied Gas Co., Ltd. (QATARGAS) (Train 1 & 2)	Sulfinol	Ras Laffan, Qatar	E.P.C.M.	1996
Pertamina (Train G)	aMDEA	Bontang, Indonesia	E.P.C.M.	1997
Qatar Liquefied Gas Co., Ltd. (QATARGAS) (Train 3)	Sulfinol	Ras Laffan, Qatar	E.P.C.M.	1998
Oman LNG LLC (Train 1 & 2)	Sulfinol	Qalhat, Oman	E.P.C.M.	2000
Union Fenosa Gas S.A.	aMDEA	Damietta, Egypt	FEED	2001
Pertamina/BP Berau Ltd.	aMDEA	Irian Jaya, Indonesia	FEED	2001
Pertamina (Train I)	aMDEA	Bontang, Indonesia	FEED	2001
Ras Laffan Liquefield Natural Gas Co., Ltd. (RasGas) (Train 3)	Ucarsol	Ras Laffan, Qatar	E.P.C.M.	2003
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II) (Train 4)	Ucarsol	Ras Laffan, Qatar	FEED	2004
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II) (Train 5)	Ucarsol	Ras Laffan, Qatar	FEED	2004
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II) (Train 5)	Ucarsol	Ras Laffan, Qatar	FEED	2004
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 6)	Ucarsol	Ras Laffan, Qatar	FEED	2004
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 7)	Ucarsol	Ras Laffan, Qatar	FEED	2004
Qatar Petroleum & Conocophillips Qatar Ltd. (Train 6 & 7)	aMDEA	Ras Laffan, Qatar	FEED	2005
Qatar Liquefied Gas Co., Ltd. (QATARGAS) (Train 1, 2 & 3 Debottlenecking)	Sulfinol	Ras Laffan, Qatar	E.P.C.	2005
Qalhat LNG S.A.O.C.	Sulfinol	Qalhat, Oman	E.P.C.	2005
PetroChina International Jabung Ltd.	aMDEA	Jambi, Indonesia	E.P.C.	2005
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II) (Train 4)	Ucarsol	Ras Laffan, Qatar	E.P.C.	2005
ExxonMobil Middle East Gas Marketing Ltd.	Ucarsol	Ras Laffan, Qatar	E.P.C.	2005
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II) (Train 5)	Ucarsol	Ras Laffan, Qatar	E.P.C.	2006
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II)	Prosernat	Ras Laffan, Qatar	FEED	2007
Sakhalin Energy Investment Co., Ltd. (Train 1 & 2)	Sulfinol	Sakhalin Island, Russia	E.P.C.	2008
Qatar Liquefied Gas Co., Ltd. (QATARGAS) (Train 4)	aMDEA	Ras Laffan, Qatar	E.P.C.	2008
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II) (Train 5)	aMDEA	Ras Laffan, Qatar	E.P.C.	2009

Client	Process	Location	Scope of Work	Year of Completion
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 6)	Ucarsol	Ras Laffan, Qatar	E.P.C.	2009
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 7)	Ucarsol	Ras Laffan, Qatar	E.P.C.	2009
ExxonMobil Barzan Limited	Ucarsol	Ras Laffan, Qatar	FEED	2009
ExxonMobil Middle East Gas Marketing Ltd.	Ucarsol	Ras Laffan, Qatar	E.P.C.	2010
Qatar Liquefied Gas Co., Ltd. (3) (QATARGAS 3) (Train 6)	aMDEA	Ras Laffan, Qatar	E.P.C.	2010
Qatar Liquefied Gas Co., Ltd. (4) (QATARGAS 4) (Train 7)	aMDEA	Ras Laffan, Qatar	E.P.C.	2010
ExxonMobil Barzan Limited	Ucarsol	Ras Laffan, Qatar	FEED	2010
Qatar Shell GTL Limited	Sulfinol	Ras Laffan, Qatar	E.P.C.	2011
Arrow Energy Pty Ltd.	ADIP	Curtis Island, Australia	FEED	2012
Woodside Energy Ltd.	BASF	James Price Point, Australia	FEED	2013
JSC Yamal LNG	aMDEA	Yamal Peninsula, Russia	FEED	2013
ExxonMobil PNG Limited	Ucarsol	Port Moresby, Papua New Guinea	E.P.C.	2014
Qatar Liquefied Gas Co., Ltd. (QATARGAS 1) (Train 1,2 & 3)	Prosernat	Ras Laffan, Qatar	E.P.C.	2014
Sonatrach	aMDEA	Arzew, Algeria	E.P.C.M.	2015
Anadarko Mozambique Area 1, Limitada	aMDEA	Cabo Delgado, Mozambique	FEED	2015

## Sulfur Recovery Units

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
Kharg Chemical Co., Ltd.	20,000 T/Y	Kharg Is., Iran	E.P.C.	1969
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	375 x 2	Das Is., U.A.E.	E.P.C.	1976
China National Technical Import Corp. (CNTIC)	90,000 T/Y	Chongqing, China	B.E.P.CS.M.T.	1981
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	490	Das Is., U.A.E.	E.P.C.	1994
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	134 x 3	Ras Laffan, Qatar	E.P.C.M.	1998
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II)	244	Ras Laffan, Qatar	E.P.C.M.	2003
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II) (Train 4)	600	Ras Laffan, Qatar	FEED	2004
(Train 5)				
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 6)	670	Ras Laffan, Qatar	FEED	2004
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 7)	670	Ras Laffan, Qatar	FEED	2004
Qatar Petroleum & Conocophillips Qatar Ltd. (Train 6 & 7)	590	Ras Laffan, Qatar	FEED	2005
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	480 x 2	Ras Laffan, Qatar	FEED	2007
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II) (Train 4)	600	Ras Laffan, Qatar	E.P.C.	2008
Qatar Liquefied Gas Co., Ltd. (II) (QATARGAS II) (Train 5)	600	Ras Laffan, Qatar	E.P.C.	2009
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 6)	670	Ras Laffan, Qatar	E.P.C.	2009
Ras Laffan Liquefied Natural Gas Co., Ltd. (3) (RasGas 3) (Train 7)	670	Ras Laffan, Qatar	E.P.C.	2009
ExxonMobil Barzan Limited	370 x 2	Ras Laffan, Qatar	FEED	2009

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
ExxonMobil Middle East Gas Marketing Ltd	670	Ras Laffan, Qatar	E.P.C.	2010
Qatar Liquefied Gas Co., Ltd. (3) (QATARGAS 3) (Train 6)	590	Ras Laffan, Qatar	E.P.C.	2010
ExxonMobil Barzan Limited	1940 x 2	Ras Laffan, Qatar	FEED	2010
Qatar Liquefied Gas Co., Ltd. (4) (QATARGAS 4) (Train 7)	590	Ras Laffan, Qatar	E.P.C.	2010
Qatar Liquefied Gas Co., Ltd. (QATARGAS 1) (Train 1,2 & 3)	880	Ras Laffan, Qatar	E.P.C.	2014

(for Petroleum Refineries please see page 31~32)

## LNG Terminals

Client	Storage Capacity (kl)	Project	Location	Scope of Work	Year of Completion
Tokyo Gas Co., Ltd.	25,000 x 1 45,000 x 3	Receiving Terminal	Negishi, Japan	B.E.P.C.	1969
Tokyo Gas Co., Ltd.	10,000 x 1	Expansion	Negishi, Japan	B.E.P.C.	1971
Tokyo Gas Co., Ltd.	35,000 x 2	Expansion	Negishi, Japan	B.E.P.C.	1971
Tokyo Gas Co., Ltd.	60,000 x 1	Expansion	Negishi, Japan	B.E.P.C.	1972
Tokyo Gas Co., Ltd.	45,000 x 2	Receiving Terminal	Sodegaura, Japan	B.E.P.C.	1973
Tokyo Electric Power Co., Inc.	45,000 x 2	Receiving Terminal (Piping Work)	Sodegaura, Japan	B.E.P.C.	1973
Tokyo Gas Co., Ltd.	60,000 x 3	Expansion	Sodegaura, Japan	B.E.P.C.	1974
Tokyo Gas Co., Ltd.	60,000 x 5	Expansion	Sodegaura, Japan	B.E.P.C.	1976
Tokyo Electric Power Co., Inc.	60,000 x 5	Expansion (Piping Work)	Sodegaura, Japan	B.E.P.C.	1976
Tokyo Gas Co., Ltd.	95,000 x 1	Expansion	Negishi, Japan	B.E.P.C.	1977
Tokyo Gas Co., Ltd.	60,000 x 2	Expansion	Sodegaura, Japan	B.E.P.C.	1977
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	—	Storage & Loading Facilities	Das Is. U.A.E.	E.P.C.	1977
Tokyo Gas Co., Ltd.	95,000 x 1	Expansion	Negishi, Japan	B.E.P.C.	1978
Tokyo Gas Co., Ltd.	60,000 x 2	Expansion	Sodegaura, Japan	B.E.P.C.	1979
Tokyo Gas Co., Ltd.	95,000 x 1	Expansion	Negishi, Japan	B.E.P.C.	1980
Tokyo Gas Co., Ltd.	95,000 x 1	Expansion	Negishi, Japan	B.E.P.C.	1982
Tokyo Gas Co., Ltd.	130,000 x 2	Expansion	Sodegaura, Japan	B.E.P.C.	1983
Nihonkai LNG Co., Ltd.	80,000 x 4	Receiving Terminal	Niigata, Japan	B.E.P.C.	1983
Tokyo Gas Co., Ltd.	130,000 x 1	Expansion	Sodegaura, Japan	B.E.P.C.	1984
Tokyo Electric Power Co., Inc.	60,000 x 7	Receiving Terminal	Higashi Ohgishima, Japan	B.E.P.C.	1984
PERTAMINA	—	Storage & 2nd Loading Facilities	Arun, Indonesia	E.P.C.	1984
Tokyo Electric Power Co., Inc.	90,000 x 4	Receiving Terminal	Futtsu, Japan	B.E.P.C.	1985
Tokyo Gas Co., Ltd.	30,000 Ton	LPG Facility for Calorie Adjustment	Sodegaura, Japan	B.E.P.C.	1986
Tokyo Electric Power Co., Inc.	—	Training Simulator	Shinagawa, Japan	B.E.P.C.	1987
Tokyo Electric Power Co., Inc.	60,000 x 2	Expansion	Higashi Ohgishima, Japan	B.E.P.C.	1987
PERTAMINA	—	Storage & 2nd Loading Facilities	Bontang, Indonesia	E.P.C.	1988
Oita Liquefied Natural Gas Co., Inc.	80,000 x 3	Receiving Terminal	Ohita, Japan	B.E.P.C.	1990
Chugoku Electric Power Co., Inc.	80,000 x 3	Receiving Terminal	Yanai, Japan	B.E.P.C.	1990

Client	Storage Capacity (kl)	Project	Location	Scope of Work	Year of Completion
Tokyo Electric Power Co., Inc.	180T/H	Vaporizer (expansion)	Higashi Ohgishima, Japan	B.E.P.C.	1991
Tokyo Electric Power Co., Inc.	125,000 x 2	Tank (expansion)	Futtsu, Japan	B.E.P.C.	1991
Tokyo Gas Co., Ltd.	for 130,000 kl Ship	Unloading Facility (expansion)	Negishi, Japan	B.E.P.C.	1991
Chugoku Electric Power Co., Inc.	80,000 x 1	Tank & Vaporization (expansion)	Yanai, Japan	P.C.	1991
Tokyo Electric Power Co., Inc.	720T/H	Gas Blower for Conduit Pipe	Futtsu, Japan	B.E.P.C.	1993
Tokyo Gas Co., Ltd.	—	Expansion	Sodegaura, Japan	B.E.P.C.	1993
Tokyo Gas Co., Ltd.	85,000 x 2	Expansion	Negishi, Japan	B.E.P.C.	1994
Oita Liquefied Natural Gas Co., Inc.	80,000 x 1	Tank (expansion)	Ohita, Japan	B.E.P.C.	1994
Nihonkai LNG Co., Ltd.	—	Vaporization Facility (expansion)	Niigata, Japan	E.P.C.	1995
Tokyo Electric Power Co., Inc.	—	Control System (replacement)	Higashi Ohgishima, Japan	B.E.P.C.	1995
Chugoku Electric Power Co., Inc.	80,000 x 2	Tank/Vaporizer (expansion)	Yanai, Japan	P.C.	1996
Tokyo Gas Co., Ltd.	200,000 x 1	Tank (expansion)	Negishi, Japan	B.E.P.C.	1996
Nippon Gas Co., Ltd.	36,000 x 1	Receiving Terminal	Kagoshima, Japan	E.P.C.	1996
Tokyo Electric Power Co., Inc.	540T/H	Gas Blower for Conduit Pipe	Futtsu, Japan	B.E.P.C.	1996
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	—	Storage & Loading Facilities	Ras Laffan, Qatar	E.P.C.	1996
Tokyo Electric Power Co., Inc.	810 T/H	Vaporizer (expansion)	Higashi Ohgishima, Japan	B.E.P.C.	1997
Sendai City Gas Bureau	80,000 x 1	Receiving Terminal	Sendai, Japan	B.E.P.C.	1997
Tokyo Gas Co., Ltd.	200,000 x 1	Unloading Facility	Ohgishima, Japan	B.E.P.C.	1998
BG plc.	—	Receiving Terminal	Pipavav, Gujarat, India	FEED	1998
Nihonkai LNG Co., Ltd.	200,000 x 1	Tank (expansion)	Niigata, Japan	P.C.	1998
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	—	Storage Facilities	Ras Laffan, Qatar	E.P.C.	1998
PERTAMINA	—	Storage & 3rd Loading Facilities	Bontang, Indonesia	E.P.C.	1998
Oita Liquefied Natural Gas Co., Inc.	140,000 x 1	Tank/Vaporizer (expansion)	Ohita, Japan	B.E.P.C.	1999
Tokyo Electric Power Co., Inc.	—	Control System (modification)	Futtsu, Japan	E.P.C.	1999
Oman LNG L.L.C.	—	Storage & Loading Facilities	Qalhat, Oman	E.P.C.	2000
Tokyo Electric Power Co., Inc.	—	Control System (Replacement for CRT Operation)	Futtsu, Japan	B.E.P.C.	2000
Tokyo Gas Co., Ltd.	200,000 x 1	Expansion	Ohgishima, Japan	B.E.P.C.	2000
Tokyo Electric Power Co., Inc.	—	Training Simulator (replacement)	Shinagawa, Japan	B.E.P.C.	2001
Tung Ting Gas Corp.	140,000 x 3	Receiving Terminal	Tao-Yuan, Taiwan	B.	2001
Tokyo Electric Power Co., Inc.	540 T/H	Vaporizer (expansion)	Futtsu, Japan	E.P.C.	2001
Toho Gas Co., Ltd.	200,000 x 1	Receiving Terminal	Midirihama, Japan	B.E.P.C.	2001
Tokyo Electric Power Co., Inc.	—	Control System (Modification)	Futtsu, Japan	B.E.P.C.	2002
Tokyo Electric Power Co., Inc.	405 T/H	Vaporizer (expansion)	Higashi Ohgishima, Japan	B.E.P.C.	2003
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II)	—	Storage & Loading Facilities	Ras Laffan, Qatar	E.P.C.	2004
Mizushima LNG Co., Ltd.	160,000 x 1	Grass-roots Receiving Terminal	Mizushima, Japan	B.E.P.C.	2005
Tokyo Electric Power Co., Inc.	—	Vaporization Facility (expansion)	Higashi Ohgishima, Japan	E.P.C.	2005
Tokyo Electric Power Co., Inc.	—	Control System (Replacement)	Futtsu, Japan	E.P.C.	2005

Client	Storage Capacity (kl)	Project	Location	Scope of Work	Year of Completion
Tokyo Electric Power Co., Inc.	—	Control System (Replacement)	Futtsu, Japan	E.P.C.	2007
Sakhalin Energy Investment Co., Ltd .	100,000 x 2	Storage & Loading Facilities	Sakhalin Is., Russia	E.P.C.	2008
Tokyo Electric Power Co., Inc.	—	Control System (Modification)	Higashi Ohgishima, Japan	E.P.C.	2009
Mizushima LNG Co., Ltd.	160,000	Expansion	Mizushima, Japan	E.P.C.	2011
Tokyo Gas Co., Ltd.	—	Expansion (Piping Work)	Sodegaura, Japan	E.P.C.	2012
Chubu Electric Power Co., Inc.	—	Receiving Terminal	Niigata, Japan	E.P.C.	2013
INPEX CORPORATION	—	Receiving Terminal	Niigata, Japan	E.P.C.	2013
Hibiki LNG Co., Ltd.	—	Receiving Terminal	Fukuoka, Japan	E.P.C.	2014
Tokyo Gas Co., Ltd.	—	Expansion (Piping Work)	Negishi, Japan	E.P.C.	2015
Tokyo Gas Co., Ltd.	—	Receiving Terminal	Hitachi, Japan	E.P.C.	2016

#### LNG Related Plant at Terminal

Tokyo Gas Co., Ltd.	100 T/H (4,000kw)	Power Generation Plant by LNG Cold Potential	Negishi, Japan	B.E.P.C.	1985
Tokyo Gas Co., Ltd.	100kg- <sup>13</sup> CH <sub>4</sub> /Y	<sup>13</sup> C Methane Plant	Negishi, Japan	B.E.P.C.	1999

## LPG Terminals

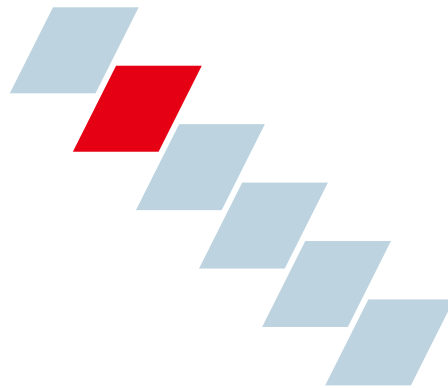
Client	Storage Capacity (Tons)	Project	Location	Scope of Work	Year of Completion
Nippon Mining Co., Ltd.	79,000	Receiving Terminal	Mizushima, Japan	B.E.P.C.	1965
Mitsubishi Corporation	60,000	Receiving Terminal	Kobe, Japan	B.E.P.C.	1966
Mitsubishi Liquefied Petroleum Gas Co., Ltd.	330	Storage & Shipping Facilities	Shizuoka, Japan	E.P.C.	1966
Kyodo Oil Co., Ltd.	40,000	Receiving Terminal	Kawasaki, Japan	B.E.P.C.	1966
Maruzen Oil Co., Ltd.	80,000	Receiving Terminal	Sakai, Japan	B.E.P.C.	1966
Idemitsu Kosan Co., Ltd.	60,000	Receiving Terminal	Aichi, Japan	B.E.P.C.	1969
Toa Nenryo Kogyo K.K.	20,000	Receiving Terminal	Kawasaki, Japan	E.P.C.	1969
General Gas Co., Ltd.	80,000	Receiving Terminal	Sakai, Japan	P.C.	1969
Kharg Chemical Co., Ltd.	—	Storage & Loading Facilities	Kharg Is., Iran	E.P.C.	1969
Toa Nenryo Kogyo K.K.	7,000	Receiving Terminal	Kawasaki, Japan	E.P.C.	1970
Idemitsu Kosan Co., Ltd.	20,000	Expansion	Aichi, Japan	B.E.P.C.	1971
Nippon Mining Co., Ltd.	34,000	Expansion	Mizushima, Japan	B.E.P.C.	1972
Tohoku Oil Co., Ltd.	105,000	Receiving Terminal	Sendai, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	100,000	Expansion	Aichi, Japan	B.E.P.C.	1972
Kashima Oil Co., Ltd.	107,000	Receiving Terminal	Kashima, Japan	B.E.P.C.	1972
Kobe Steel, Ltd.	60,000	Receiving Terminal & Vaporization Plant	Kakogawa, Japan	B.E.P.C.	1973
Sumitomo Metal Industries, Ltd.	48,000	Receiving Terminal	Wakayama, Japan	B.E.P.C.	1974
Tokyo Electric Power Co., Inc.	121,000 260T/H	Receiving Terminal & Vaporization Plant	Anegasaki, Japan	B.E.P.C.	1975
Sumitomo Metal Industries, Ltd.	40T/H	Vaporization Plant (expansion)	Wakayama, Japan	E.P.C.	1976
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	—	Storage & Loading Facilities	Das Is. U.A.E .	E.P.C.	1977
Iwatani & Co., Ltd.	80,000	Receiving Terminal	Sakai, Japan	B.E.P.C.	1980
Tokyo Electric Power Co., Inc.	102,000	Expansion	Anegasaki, Japan	B.E.P.C.	1980

Client	Storage Capacity (Tons)	Project	Location	Scope of Work	Year of Completion
Qatar General Petroleum Corp. (QGPC)	—	Storage & Loading Facilities	Umm Said, Qatar	E.P.C.	1980
Kyokuto Petroleum Industries, Ltd.	180,000	Receiving Terminal	Chiba, Japan	B.	1981
Maruzen Oil Co., Ltd.	320,000	Receiving Terminal	Nagasaki, Japan	E.P.C.	1981
Chugoku Electric Power Co., Inc.	10,000	Vaporization Plant	Iwakuni, Japan	E.P.C.	1982
Tohoku Electric Power Co., Inc.	80T/H	Vaporization Plant	Sendai, Japan	B.E.P.C.	1982
Zen-nho Fuel Terminal Corp.	130,000	Receiving Terminal	Sakaide, Japan	B.P.C.	1983
Tohoku Oil Co., Ltd.	90,000	Expansion	Sendai, Japan	B.E.P.C.	1983
Namikata Terminal Co., Ltd.	180,000	Receiving Terminal (Incl. Chemicals)	Ehime, Japan	B.E.P.C.	1983
Tokyo Gas Co., Ltd.	35,000	Receiving Terminal	Sodegaura, Japan	E.P.C.	1986
Oita LPG Joint Stockpiling Co., Ltd.	215,000	Storage Terminal	Ohita, Japan	P.C.	1987
Chubu Electric Power Co., Inc.	48T/H	Vaporization Facility	Yokkaichi, Japan	E.P.C.	1988
PERTAMINA	—	Storage & 2nd Loading Facilities	Bontang, Indonesia	E.P.C.	1988
Japan National Oil Corp.	400 kl	Water Sealed Mined Cavern Storage (pilot)	Kurashiki, Japan	E.P.C.	1992
Kashima LPG Joint Stockpiling Co., Ltd.	225,000	Storage Terminal	Kashima, Japan	B.E.P.C.	1994
Continental Grain Co./ Shanghai Petrochemical Co., Ltd.	100,000	Receiving Terminal	Shanghai, China	FEED	1994
Tokai Co., Ltd.	940	Storage & Shipping Facilities	Shizuoka, Japan	E.P.C.	1995
MC Terminal Co., Ltd.	—	Restoration	Kobe, Japan	E.P.C.	1996
Tokyo Gas Co., Ltd.	35,000	Receiving Terminal	Ogishima, Japan	E.P.C.	1998
PERTAMINA	—	Storage & 3rd Loading Facilities	Bontang, Indonesia	E.P.C.	1998
Malaysian Refining Co., Sdn. Bhd.	—	Storage Facilities	Melaka, Malaysia	E.P.C.	1998
BP Ningbo Huadong LPG Co., Ltd.	—	Receiving Terminal (Water Sealed Mined Cavern Storage)	Ningbo, China	E.P.C.	2002
Japan Oil, Gas and Metals National Corporation	200,000	Storage Terminal	Nagasaki, Japan	E.P.C.	2005
Japan Oil, Gas and Metals National Corporation	200,000	Storage Terminal	Kamisu, Japan	E.P.C.	2005
ExxonMobil Middle East Gas Marketing Ltd.	—	Storage & Loading Facilities	Ras Laffan, Qatar	E.P.C.	2005
Japan Oil, Gas and Metals National Corporation	400,000	Storage Terminal (Water Sealed Mined Cavern Storage)	Kurashiki, Japan	E.P.C.	2012
Japan Oil, Gas and Metals National Corporation	450,000	Storage Terminal (Water Sealed Mined Cavern Storage)	Namikata, Japan	E.P.C.	2013
Japan Oil, Gas and Metals National Corporation	—	Storage Terminal (Water Sealed Mined Cavern Storage)	Namikata, Japan	E.P.C.	2015

## CCS (Carbon Capture & Storage)

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Electric Power Development Co., Ltd. (J-Power)	CO <sub>2</sub> Separation and Recovery Plant for Coal Gasification Process	1,000m <sup>3</sup> N/h	Fukuoka, Japan	E.P.C.	2012
Toshiba Energy Systems & Solutions Corporation	Large-Scale Carbon Capture Facility	500t/d	Fukuoka, Japan	E.P.C.	(2020)

# Petroleum Refineries



Crude Distillation Units.....	14
Vacuum Flasher/Vacuum Distillation Units.....	16
Catalytic Reforming Units.....	17
(for Aromatics please see page 51~58)	
Gasoline Selective Desulfurization Units.....	19
Naphtha and Middle Distillate Hydrodesulfurization Units.....	20
Vacuum Gas Oil Hydrodesulfurization Units .....	23
Hydrocracking Units.....	24
Fluid Catalytic Cracking Units .....	24
Residuum Hydrodesulfurization Units.....	25
Visbreaking Units.....	26
Thermal Cracking Units.....	26
Solvent Deasphalting Units .....	27
Sweetening Units .....	27
Alkylation Units.....	29
Isomerization Units.....	29
Distillate Dewaxing Units.....	29
Hydrogen Manufacturing Units .....	30
Sulfur Recovery Units.....	31
Claus Tail Gas Treating Units.....	32
H <sub>2</sub> S Removal Units with Amine .....	33
Sour Water Stripping Units.....	34
Blown Asphalt (Bitumen) Units.....	36
Condensate Splitter Units .....	37
Lubricating Oil Refining Units.....	37

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<b>Scope of Work</b>	B: Basic Design/FEED
	E: Engineering
	P: Procurement
	PS: Procurement Service
	C: Construction
	CS: Construction Supervision
	M: Start-up and Commissioning
	T: Training

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<b>Remarks</b>	Re: Revamping
	Ex: Expansion

# Crude Distillation Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Koa Oil Co., Ltd.	9,000	Marifu, Japan	C.	1950
Mitsubishi Oil Co., Ltd.	1,000	Kawasaki, Japan	C.	1951
Showa Sekiyu K.K.	4,000	Niigata, Japan	C.	1951
Showa Sekiyu K.K.	4,000	Kawasaki, Japan	C.	1951
Mitsubishi Oil Co., Ltd.	7,200	Kawasaki, Japan	B.E.P.C.	1952
Mitsubishi Oil Co., Ltd.	12,000	Kawasaki, Japan	B.E.P.C.	1954
Asia Oil Co., Ltd.	10,000	Yokohama, Japan	B.E.P.C.	1957
Mitsubishi Oil Co., Ltd.	50,000	Kawasaki, Japan	B.E.P.C.	1957
Maruzen Oil Co., Ltd.	25,000	Matsuyama, Japan	B.E.P.C.	1957
Mitsubishi Oil Co., Ltd.	22,500	Mizushima, Japan	B.E.P.C.	1961
Asia Oil Co., Ltd.	50,000	Yokohama, Japan	B.E.P.C.	1961
Maruzen Oil Co., Ltd.	50,000	Chiba, Japan	B.E.P.C.	1962
Mitsubishi Oil Co., Ltd.	3,500	Kawasaki, Japan	B.E.P.C.	1962
Showa Sekiyu K.K.	40,000	Niigata, Japan	E.P.C.	1963
Toho Oil Co., Ltd.	40,000	Owase, Japan	B.E.P.C.M.	1964
Nippon Petroleum Refining Co., Ltd.	110,000	Negishi, Japan	B.E.P.C.	1964
Showa Yokkaichi Sekiyu Co., Ltd.	105,000	Yokkaichi, Japan	B.E.P.C.	1965
Mobil Refining Co. (Malaysia) Ltd. / Fluor Corp.	25,000	Jurong, Singapore	B.E.P.	1965
General Sekiyu Seisei K.K.	60,000	Sakai, Japan	E.P.C.	1965
Mitsubishi Oil Co., Ltd.	80,000	Mizushima, Japan	B.E.P.C.	1966
Showa Sekiyu K.K.	40,000	Niigata, Japan	B.E.P.C.	1966
General Petroleum & Mineral Organization (PETROMIN)	12,000	Jeddah, Saudi Arabia	E.P.C.	1967
Taiyo Oil Co., Ltd.	50,000	Kikuma, Japan	B.E.P.C.M.	1968
Toa Oil Co., Ltd.	65,000	Kawasaki, Japan	B.E.P.C.	1968
Summit Industrial Corp.	20,000	Bangchack, Thailand	B.E.P.CS.	1968
Fuji Oil Co., Ltd.	70,000	Sodegaura, Japan	B.E.P.C.	1968
Nippon Petroleum Refining Co., Ltd.	55,000 x 2	Negishi, Japan	B.E.P.C.	1969
Nippon Mining Co., Ltd.	70,000	Mizushima, Japan	B.	1969
Showa Sekiyu K.K.	100,000	Kawasaki, Japan	B.E.P.C.	1969
Seibu Oil Co., Ltd.	50,000	Yamaguchi, Japan	B.E.P.C.	1970
General Sekiyu K.K.	60,000	Sakai, Japan	E.P.C.	1970
Fuji Oil Co., Ltd.	70,000	Sodegaura, Japan	B.E.P.C.	1970
Esso Singapore Private Ltd.	80,000	Pulau Ayer, Chawan Is., Singapore	E.P.C.	1970
Jordan Petroleum Refinery Co., Ltd.	8,000	Zarqa, Jordan	E.P.C.M.	1970
Esso Standard Okinawa K.K.	78,000	Nishibaru, Japan	E.P.C.	1970
Kashima Oil Co., Ltd.	120,000	Kashima, Japan	B.E.P.C.	1971
Chinese Petroleum Corp.	100,000	Kaohsiung, Taiwan	B.E.P.M.	1971
Mitsubishi Oil Co., Ltd.	75,000	Kawasaki, Japan	B.E.P.C.	1971
Taiyo Oil Co., Ltd.	20,000	Kikuma, Japan	B.E.P.C.	1971
Tohoku Oil Co., Ltd.	40,000	Sendai, Japan	B.E.P.C.	1971
Okinawa Sekiyu Seisei Co., Ltd.	100,000	Okinawa, Japan	B.E.P.C.	1972
Showa Yokkaichi Sekiyu Co., Ltd.	150,000	Yokkaichi, Japan	B.E.P.C.	1972
Fuji Kosan Co., Ltd.	50,000	Kainan, Japan	B.E.P.C.M.	1972



Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Mobil Oil Singapore Pte. Ltd.	157,000	Jurong, Singapore	E.P.C.	1973
Mobil Refining Co., Southern Africa (Pty) Ltd.	50,000	Durban, South Africa	B.E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	33,000	Jeddah, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	15,000	Riyadh, Saudi Arabia	E.P.C.	1974
Fuji Oil Co., Ltd.	40,000	Sodegaura, Japan	B.E.P.C.	1976
Seibu Oil Co., Ltd.	100,000	Yamaguchi, Japan	B.E.P.C.	1976
Corporación Estatal Petrolera Ecuatoriana	55,000	Esmeraldas, Ecuador	E.P.C.	1976
Taiyo Oil Co., Ltd.	8,200	Kikuma, Japan	E.P.C.	1978
Toa Oil Co., Ltd.	65,000	Kawasaki, Japan	B.E.P.C.	1979
Nigerian National Petroleum Corp. (NNPC)	50,000 x 2	Kaduna, Nigeria	B.E.P.C.M.T.	1980
General Petroleum & Mineral Organization (PETROMIN)	100,000	Riyadh, Saudi Arabia	E.P.C.	1981
Kuwait Oil Co. (KSC)	29,000 x 2	Mina Al-Ahmadi, Kuwait	B.E.P.C.M.	1982
Mobil Oil Singapore Pte. Ltd.	Re. 45,000 (from 25,000)	Jurong, Singapore	B.E.P.C.	1982
State Organization for Oil Projects (SCOP)	150,000	Baiji, Iraq	B.E.P.C.M.T.	1983
General Petroleum & Mineral Organization (PETROMIN)	170,000	Yanbu, Saudi Arabia	E.P.C.	1983
Petromin Mobil Yanbu Refinery Co., Ltd.	263,000	Yanbu, Saudi Arabia	E.P.C.	1984
Petromin Shell Refinery Co.	136,000 x 2	Al-Jubail, Saudi Arabia	E.P.C.M.T.	1985
The New Zealand Refining Co., Ltd.	38,000 Re. 56,000 (from 78,000)	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
Arabian American Oil Co. (Aramco)	250,000	Ras Tanura, Saudi Arabia	E.P.C.	1986
Nigerian National Petroleum Corp. (NNPC)	Re. 60,000 (from 50,000)	Kaduna, Nigeria	B.E.P.C.	1986
Corporación Estatal Petrolera Ecuatoriana	45,000	Esmeraldas, Ecuador	E.P.C.	1987
Thai Oil Co., Ltd.	Re. 43,000 (from 30,000)	Sriracha, Thailand	E.P.C.M.	1989
Kyung In Energy Co., Ltd.	150,000	Inchon, Korea	B.E.PS.CS.M.	1991
Thai Oil Co., Ltd.	100,000	Sriracha, Thailand	E.P.C.M.	1993
The Bangchak Petroleum Co., Ltd.	40,000	Bangkok, Thailand	E.P.C.	1993
Shell Eastern Petroleum Pte Ltd. (SEPL)	Re. —	Bukom, Singapore	E.P.C.	1993
Yukong Ltd.	200,000	Ulsan, Korea	E.P.C.	1996
Malaysian Refining Co., Sdn. Bhd. (MRC)	100,000	Melaka, Malaysia	E.P.C.M.	1998
Taiyo Oil Co., Ltd.	Re. 86,000 (from 70,000) (splitter 30,000)	Kikuma, Japan	B.E.P.C.	2004
Japan Energy Corporation	Re. 95,200 (renewal)	Mizushima, Japan	B.E.P.C.	2009
Seibu Oil Co., Ltd.	Re. 120,000 *(Partial renewal)	Yamaguchi, Japan	B.E.P.C.	2012
Fuji Oil Co., Ltd.	Re. 143,000 (Partial renewal)	Sodegaura, Japan	E.P.C.	2013

\*Partially Renovating Shell Plates of Tower by C-Phoenix Method

# Vacuum Flasher/Vacuum Distillation Units

\*Vacuum Distillation for Lubricating Oil

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Mitsubishi Oil Co., Ltd.	800	Kawasaki, Japan	C.	1951
Mitsubishi Oil Co., Ltd.	1,600	Kawasaki, Japan	B.E.P.C.	1952
Mitsubishi Oil Co., Ltd.	*3,500	Kawasaki, Japan	B.E.P.C.	1957
Asia Oil Co., Ltd.	1,000	Yokohama, Japan	B.E.P.C.	1958
Mitsubishi Oil Co., Ltd.	20,000	Mizushima, Japan	B.E.P.C.	1961
Nippon Petroleum Refining Co., Ltd.	15,000	Yokohama, Japan	C.	1962
Mitsubishi Oil Co., Ltd.	*3,500	Kawasaki, Japan	B.E.P.C.	1962
Mitsubishi Oil Co., Ltd.	*17,000	Mizushima, Japan	B.E.P.C.	1967
General Petroleum & Mineral Organization (PETROMIN)	4,200	Jeddah, Saudi Arabia	E.P.C.	1967
Fuji Oil Co., Ltd.	33,500	Sodegaura, Japan	B.E.P.C.M.	1968
Nippon Petroleum Refining Co., Ltd.	30,000	Negishi, Japan	B.E.P.C.	1968
Nippon Petroleum Refining Co., Ltd.	33,000	Negishi, Japan	B.E.P.C.	1969
Nippon Petroleum Refining Co., Ltd.	45,000	Negishi, Japan	B.E.P.C.	1969
Mitsubishi Oil Co., Ltd.	50,000	Mizushima, Japan	B.E.P.C.	1969
Showa Sekiyu K.K.	30,000	Kawasaki, Japan	B.E.P.C.	1969
Seibu Oil Co., Ltd.	10,000	Yamaguchi, Japan	B.E.P.C.	1970
General Sekiyu K.K.	53,000	Sakai, Japan	E.P.C.	1970
Kashima Oil Co., Ltd.	25,000	Kashima, Japan	B.E.P.C.	1971
Fuji Kosan Co., Ltd.	*14,000	Kainan, Japan	B.E.P.C.	1972
Showa Yokkaichi Sekiyu Co., Ltd.	60,000	Yokkaichi, Japan	B.E.P.C.	1972
Nippon Petroleum Refining Co., Ltd.	35,000	Negishi, Japan	B.E.P.C.	1973
Nippon Mining Co., Ltd.	*27,000	Mizushima, Japan	B.E.P.C.	1973
Tohoku Oil Co., Ltd.	60,000	Sendai, Japan	B.E.P.C.	1973
General Petroleum & Mineral Organization (PETROMIN)	6,500	Riyadh, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	16,000	Jeddah, Saudi Arabia	E.P.C.	1974
Fuji Oil Co., Ltd.	50,000	Sodegaura, Japan	B.E.P.C.	1976
Toa Oil Co., Ltd.	52,700	Kawasaki, Japan	E.P.C.	1976
Corporación Estatal Petrolera Ecuatoriana	26,600	Esmeraldas, Ecuador	E.P.C.	1976
Petromin Lubricating Oil Refining Co.	*21,600	Jeddah, Saudi Arabia	C.	1977
Nigerian National Petroleum Corp. (NNPC)	*23,000	Kaduna, Nigeria	B.E.P.C.M.T.	1980
Nigerian National Petroleum Corp. (NNPC)	15,200	Kaduna, Nigeria	B.E.P.C.M.T.	1980
General Petroleum & Mineral Organization (PETROMIN)	40,000	Riyadh, Saudi Arabia	E.P.C.	1981
Mobil Oil Singapore Pte. Ltd.	75,000	Jurong, Singapore	B.E.P.C.	1982
Alexandria Petroleum Co.	*23,200	Alexandria, Egypt	E.P.C.	1982
State Organization for Oil Projects (SCOP)	65,000	Baiji, Iraq	B.E.P.C.M.T.	1983
Petromin-Mobil Yanbu Refinery Co., Ltd.	117,000	Yanbu, Saudi Arabia	E.P.C.	1984
Petromin Shell Refinery Co.	69,000	Al-Jubail, Saudi Arabia	E.P.C.M.T.	1985
Arabian American Oil Co. (Aramco)	155,000	Ras Tunura, Saudi Arabia	E.P.C.	1986
The New Zealand Refining Co., Ltd.	37,000 Re. 7,100 (from 2,600)	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
Seibu Oil Co., Ltd.	40,000	Yamaguchi, Japan	B.E.P.C.	1986

\*Vacuum Distillation for Lubricating Oil

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Corporación Estatal Petrolera Ecuatoriana	14,500 Re. 28,500 (from 26,600)	Esmeraldas, Ecuador	E.P.C.	1987
Taiyo Oil Co., Ltd.	20,000	Kikuma, Japan	B.E.P.C.	1988
Thai Oil Co., Ltd.	33,200	Sriracha, Thailand	E.P.C.M.	1989
Nihonkai Oil Co., Ltd.	10,000	Toyama, Japan	B.E.P.C.	1989
Kyung In Energy Co., Ltd.	20,000	Inchon, Korea	B.E.P.S.C.S.M.	1991
Yukong Ltd.	63,000	Ulsan, Korea	B.E.P.S.C.S.M.	1992
Saudi Aramco Lubricating Oil Refining Co. (LUBREF)	*25,300	Yanbu, Saudi Arabia	E.P.C.	1997
Thai Oil Co., Ltd.	35,700	Sriracha, Thailand	E.P.C.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)	62,000	Melaka, Malaysia	E.P.C.M.	1998
Kashima Oil Co., Ltd.	Re. 50,000 (from 42,000)	Kashima, Japan	E.P.C.	2014

## Catalytic Reforming Units

\*CCR: Continuous Catalyst Regeneration

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
<b>Platforming</b>				
Mitsubishi Oil Co., Ltd.	3,600	Mizushima, Japan	E.P.C.	1961
Showa Sekiyu K.K.	4,800	Niigata, Japan	E.P.C.	1963
Showa Yokkaichi Sekiyu Co., Ltd.	22,800	Yokkaichi, Japan	E.P.C.	1965
Mobil Refining Co., (Malaysia) Ltd./ Fluor Corp.	2,400	Jurong, Singapore	E.P.	1965
Showa Sekiyu K.K.	4,800	Niigata, Japan	E.P.C.	1966
General Petroleum & Mineral Organization (PETROMIN)	3,700	Jeddah, Saudi Arabia	E.P.C.	1967
Fuji Oil Co., Ltd.	6,500	Sodegaura, Japan	E.P.C.M.	1968
Showa Sekiyu K.K.	14,000	Kawasaki, Japan	E.P.C.	1969
Seibu Oil Co., Ltd.	6,000	Yamaguchi, Japan	E.P.C.	1970
Kashima Oil Co., Ltd.	6,000	Kashima, Japan	E.P.C.	1971
Showa Yokkaichi Sekiyu Co., Ltd.	20,000	Yokkaichi, Japan	E.P.C.	1972
General Petroleum & Mineral Organization (PETROMIN)	2,800	Jeddah, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	5,600	Riyadh, Saudi Arabia	E.P.C.	1974
Seibu Oil Co., Ltd.	11,000	Yamaguchi, Japan	E.P.C.	1976
Corporación Estatal Petrolera Ecuatoriana	2,800	Esmeraldas, Ecuador	E.P.C.	1976
General Petroleum & Mineral Organization (PETROMIN)	30,000	Riyadh, Saudi Arabia	E.P.C.	1981
General Petroleum & Mineral Organization (PETROMIN)	35,000	Yanbu, Saudi Arabia	E.P.C.M.	1983
State Organization for Oil Projects (SCOP)	*22,000	Baiji, Iraq	B.E.P.C.M.T.	1983
Petromin-Mobil Yanbu Refinery Co., Ltd.	*32,000	Yanbu, Saudi Arabia	E.P.C.	1984
Petromin Shell Refinery Co.	*16,000	Al-Jubail, Saudi Arabia	E.P.C.	1985

# Catalytic Reforming Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Mitsubishi Oil Co., Ltd.	*18,500	Mizushima, Japan	B.E.P.C.	1985
The New Zealand Refining Co., Ltd.	Re.23,000 (from 25,000)	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
Nippon Petroleum Refining Co., Ltd.	*26,000	Negishi, Japan	B.E.P.C.	1986
Toa Nenryo Kogyo Co., Ltd.	*24,000	Kawasaki, Japan	E.P.C.	1990
Nippon Mining Co., Ltd.	*24,000	Mizushima, Japan	E.P.C.	1990
Taiyo Oil Co., Ltd.	*23,000	Kikuma, Japan	E.P.C.	1991
Okinawa Sekiyu Seisei Co., Ltd.	*17,000	Okinawa, Japan	B.E.P.C.M.	1992
Thai Oil Co., Ltd.	*23,900	Sriracha, Thailand	E.P.C.M.	1993
Shell Eastern Petroleum Pte. Ltd. (SEPL)	*17,000	Pulau Ular, Singapore	B.E.P.C.	1994
Tripetrol Oil Trading Inc., S.A. (TOTISA)	*18,000	Khabarovsk, Russia	E.	1995
Koa Oil Co., Ltd.	Re. 14,000 (from 11,000)	Osaka, Japan	E.P.C.M.	1996
Taiyo Oil Co., Ltd.	Re.30,000 (from 23,000)	Kikuma, Japan	E.P.C.	1996
National Iranian Oil Co. (NIOC)	*36,000	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)	*26,000	Melaka, Malaysia	E.P.C.M.	1998
The Ministry of Oil and Gas Industry and Mineral Resources of Turkmenistan	*19,200	Turkmenbashi, Turkmenistan	E.P.C.	2000
PERTAMINA	*20,000 (Restoration)	Balikpapan, Indonesia	E.P.C.	2001
Petróleos de Venezuela S.A. (PDVSA)	*35,000	Puerto La Cruz, Venezuela	E.P.C.M.	2004
Taiyo Oil Co., Ltd.	Re.37,000 (from 30,000)	Kikuma, Japan	E.P.C.	2006
Seibu Oil Co., Ltd.	*25,000	Yamaguchi, Japan	E.P.C.	2009
JXTG Nippon Oil & Energy Corporation	30,000	Negishi, Japan	E.P.C.	2017

## Rheniforming

Tohoku Oil Co., Ltd.	6,000	Sendai, Japan	B.E.P.C.	1971
Taiyo Oil Co., Ltd.	5,000	Kikuma, Japan	B.E.P.C.	1971
Nippon Petroleum Refining Co., Ltd.	18,000	Muroran, Japan	B.E.P.C.	1973
Fuji Oil Co., Ltd.	6,500	Sodegaura, Japan	B.E.P.C.	1976
Mitsubishi Oil Co., Ltd.	8,500	Kawasaki, Japan	B.E.P.C.	1979
Kuwait Oil Co. (KOC)	18,000 x 2	Mina Al-Ahmadi, Kuwait	B.E.P.C.M.	1982

## Powerforming

General Sekiyu K.K.	12,000	Sakai, Japan	E.P.C.	1965
General Sekiyu K.K.	Re. 25,000 (from 12,000)	Sakai, Japan	E.P.C.	1970
Esso Singapore Private Ltd.	4,900	Pulau Ayer Chawan Is., Singapore	E.P.C.	1970
Esso Standard Okinawa K.K.	9,600	Nishibaru, Japan	E.P.C.	1970
Guam Oil Refining Co.	3,500	Guam, U.S.A.	B.	1979

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
<b>Other Reforming</b>				
Summit Industrial Corp.	5,000	Bangchak, Thailand	B.E.P.CS.	1968
Mobil Refining Co., Southern Africa (Pty) Ltd.	10,000	Durban, South Africa	B.E.P.C.	1974
Mobil Oil Singapore Pte. Ltd.	10,000	Jurong, Singapore	E.P.C.	1978
Nigerian National Petroleum Corp. (NNPC)	17,500	Kaduna, Nigeria	B.E.P.C.M.T.	1980
The Bangchak Petroleum Co., Ltd.	5,500 5,000	Bangkok, Thailand	Consulting	1989
PETRONAS Penapisan (Terengganu) Sdn. Bhd.	6,500	Kerteh, Malaysia	E.P.C.	1990
Kyung In Energy Co., Ltd.	25,000	Inchon, Korea	B.E.PS.CS.M.	1991
The Bangchak Petroleum Co., Ltd.	7,000	Bangkok, Thailand	E.P.C.	1993
Arabian Industrial Fibers Co. (Ibn Rushd)	220,000 T/Y	Yanbu, Saudi Arabia	E.P.C.M.	1998
Qatar Fuel Additives Co., Ltd. (QAFAC)	390,000 T/Y	Umm Said, Qatar	E.P.C.M.	1999

(for Aromatics please see page 51~58)

## Gasoline Selective Desulfurization Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Fuji Oil Co., Ltd.	13,000	Sodegaura, Japan	E.P.C.	2003
Showa Yokkaichi Sekiyu Co., Ltd.	21,000	Yokkaichi, Japan	E.P.C.	2004
Seibu Oil Co., Ltd.	13,000	Yamaguchi, Japan	E.P.C.	2004
Nippon Petroleum Refining Co., Ltd.	30,000	Mizushima, Japan	B.E.P.C.	2004
Idemitsu Kosan Co., Ltd.	15,000	Tomakomai, Japan	E.P.C.	2004
Idemitsu Kosan Co., Ltd.	16,500	Chiba, Japan	B.E.P.C. ※	2005
Fuji Oil Co., Ltd.	Re. 21,000 (from 13,000)	Sodegaura, Japan	E.P.C.	2008

※ EPC : Chiyoda Kosho Co., Ltd.

# Naphtha and Middle Distillate Hydrodesulfurization Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
<b>Naphtha</b>				
Mobil Refining Co., (Malaysia) Ltd./ Fluor Corp.	12,000	Jurong, Singapore	E.P.	1965
General Sekiyu K.K.	18,000	Sakai, Japan	E.P.C.	1965
Showa Yokkaichi Sekiyu Co., Ltd.	35,000	Yokkaichi, Japan	B.E.P.C.	1965
General Petroleum & Mineral Organization (PETROMIN)	3,700	Jeddah, Saudi Arabia	E.P.C.	1967
Fuji Oil Co., Ltd.	7,100	Sodegaura, Japan	E.P.C.M.	1968
General Sekiyu K.K.	Re. 40,000 (from 18,000)	Sakai, Japan	E.P.C.	1970
Esso Singapore Private Ltd.	25,000	Pulau Ayer, Chawan Is. Singapore	B.E.P.C.	1970
Nansei Sekiyu Seisei Co., Ltd.	19,500	Okinawa, Japan	E.P.C.	1970
Kashima Oil Co., Ltd.	8,000	Kashima, Japan	E.P.C.	1971
Taiyo Oil Co., Ltd.	7,000	Kikuma, Japan	B.E.P.C.	1971
Okinawa Sekiyu Seisei Co., Ltd.	20,000	Okinawa, Japan	B.E.P.C.	1972
Showa Yokkaichi Sekiyu Co., Ltd.	27,000	Yokkaichi, Japan	B.E.P.C.	1972
Mobil Oil Singapore Pte. Ltd.	20,000	Jurong, Singapore	E.P.C.	1973
Nippon Petroleum Refining Co., Ltd.	32,000	Muroran, Japan	B.E.P.C.	1973
Fuji Oil Co., Ltd.	18,000	Sodegaura, Japan	B.E.P.C.	1974
Corporación Estatal Petrolera Ecuatoriana	2,780	Esmeraldas, Ecuador	E.P.C.	1976
Seibu Oil Co., Ltd.	26,000	Yamaguchi, Japan	B.E.P.C.	1976
Toa Oil Co., Ltd.	3,500	Kawasaki, Japan	E.P.C.	1976
Mobil Oil Singapore Pte. Ltd.	13,000	Jurong, Singapore	E.P.C.	1978
Mitsubishi Oil Co., Ltd.	8,500	Kawasaki, Japan	B.E.P.C.	1979
Nigerian National Petroleum Corp. (NNPC)	24,000	Kaduna, Nigeria	B.E.P.C.M.T.	1980
General Petroleum & Mineral Organization (PETROMIN)	27,000	Riyadh, Saudi Arabia	E.P.C.	1981
Kuwait Oil Co. (KSC)	18,000 x 2	Mina Al-Ahmadi, Kuwait	B.E.P.C.M.	1982
General Petroleum & Mineral Organization (PETROMIN)	35,000	Yanbu, Saudi Arabia	E.P.C.M.	1983
State Organization for Oil Projects (SCOP)	41,000	Baiji, Iraq	B.E.P.C.M.T.	1983
Petromin-Mobil Yanbu Refinery Co., Ltd.	83,000	Yanbu, Saudi Arabia	E.P.C.	1984
Petromin Shell Refinery Co.	63,000	Al-Jubail, Saudi Arabia	E.P.C.	1985
The New Zealand Refining Co., Ltd.	Re. 36,000 (from 40,000)	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
Nippon Petroleum Refining Co., Ltd.	35,000	Negishi, Japan	B.E.P.C.	1986
PETRONAS Penapisan (Terengganu) Sdn. Bhd.	6,500	Kerteh, Malaysia	E.P.C.	1990
Kyung In Energy Co., Ltd.	25,000	Inchon, Korea	E.PS.CS.M.	1991
Taiyo Oil Co., Ltd.	31,000	Kikuma, Japan	E.P.C.	1991
Okinawa Sekiyu Seisei Co., Ltd.	20,000	Okinawa, Japan	B.E.P.C.M.	1992
Thai Oil Co., Ltd.	32,900	Sriracha, Thailand	E.P.C.M.	1993
The Bangchak Petroleum Co., Ltd.	13,800	Bangkok, Thailand	E.P.C.	1993
Taiyo Oil Co., Ltd.	Re. 37,000 (from 31,000)	Kikuma, Japan	B.E.P.C.	1996
National Iranian Oil Co. (NIOC)	36,000	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)	35,000	Melaka, Malaysia	E.P.C.M.	1998
The Ministry of Oil and Gas Industry and Mineral Resources of Turkmenistan	19,200	Turkmenbashi, Turkmenistan	E.P.C.	2000

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Petróleos de Venezuela S.A. (PDVSA)	35,000 25,100 (Naphtha Splitter)	Puetro la Cruz, Venezuela	E.P.C.M.	2004
Taiyo Oil Co., Ltd.	Re.43,000 (from 37,000)	Kikuma, Japan	B.E.P.C.	2006
North Refineries Company (NRC) (Furnace Replacement)	41,000	Baiji, Iraq	E.P.	2015
Laffan Refinery Company Limited 2	71,000	Ras Laffan, Qatar	E.P.C.	2016

### Kerosene

General Sekiyu K.K.	10,000	Sakai, Japan	E.P.C.	1965
Summit Industrial Corp.	18,000	Bangchak, Thailand	E.P.CS.	1968
Showa Sekiyu K.K.	17,000	Kawasaki, Japan	B.E.P.C.	1969
Seibu Oil Co., Ltd.	19,800	Yamaguchi, Japan	B.E.P.C.	1970
General Sekiyu K.K.	Re.15,600 (from 10,000)	Sakai, Japan	B.E.P.C.	1970
Jordan Petroleum Refinery Co., Ltd.	2,000	Zerqa, Jordan	E.P.C.M.	1970
Esso Singapore Private Ltd.	12,000	Pulau Ayer, Chawan Is. Singapore	E.P.C.	1970
Esso Standard Okinawa K.K.	12,000	Nishibaru, Japan	E.P.C.	1970
Kashima Oil Co., Ltd.	14,000	Kashima, Japan	B.E.P.C.	1971
Idemitsu Kosan Co., Ltd.	40,000	Chiba, Japan	B.E.P.C.	1972
Showa Yokkaichi Sekiyu Co., Ltd.	20,000	Yokkaichi, Japan	B.E.P.C.	1972
Nippon Petroleum Refining Co., Ltd.	24,000	Muroran, Japan	B.E.P.C.	1973
Mobil Refining Co., Southern Africa (Pty) Ltd.	10,000	Durban, South Africa	B.E.P.C.	1974
Seibu Oil Co., Ltd.	12,500	Yamaguchi, Japan	B.E.P.C.	1976
Nigerian National Petroleum Corp. (NNPC)	18,000	Kaduna, Nigeria	B.E.P.C.M.T.	1980
General Petroleum & Mineral Organization (PETROMIN)	15,000	Riyadh, Saudi Arabia	E.P.C.	1981
General Petroleum & Mineral Organization (PETROMIN)	15,000	Yanbu, Saudi Arabia	E.P.C.M.	1983
State Organization for Oil Projects (SCOP)	28,000	Baiji, Iraq	B.E.P.C.M.T.	1983
Petromin Shell Refining Co.	48,000	Al-Jubail, Saudi Arabia	E.P.C.M.T.	1985
The New Zealand Refining Co., Ltd.	11,000	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
National Iranian Oil Co. (NIOC)	25,000	Bandar Abbas, Iran	B.E.P.CS.M.	1997
North Refineries Company (NRC) (Furnace Replacement)	28,000	Baiji, Iraq	E.P.	2014
Laffan Refinery Company Limited 2	60,800	Ras Laffan, Qatar	E.P.C.	2016

### Gas Oil

Showa Sekiyu K.K.	4,000	Niigata, Japan	B.E.P.C.	1963
Showa Yokkaichi Sekiyu Co., Ltd.	13,500 14,000	Yokkaichi, Japan	B.E.P.C.	1965
General Sekiyu K.K.	4,000 12,000	Sakai, Japan	E.P.C.	1965
Showa Sekiyu K.K.	2,000	Niigata, Japan	B.E.P.C.	1966
Seibu Oil Co., Ltd.	4,500	Yamaguchi, Japan	B.E.P.C.	1970
General Sekiyu K.K.	Re. 5,000 (from 4,000) Re. 19,000 (from 12,000)	Sakai, Japan	E.P.C.	1970

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Esso Singapore Private Ltd.	9,000	Pulau Ayer, Chawan Is. Singapore	E.P.C.	1970
Esso Singapore Private Ltd.	9,000	Pulau Ayer, Chawan Is. Singapore	E.P.C.	1970
Kashima Oil Co., Ltd.	11,000	Kashima, Japan	B.E.P.C.	1971
Okinawa Sekiyu Seisei Co., Ltd.	15,000	Okinawa, Japan	B.E.P.C.	1972
Showa Yokkaichi Sekiyu Co., Ltd.	20,000	Yokkaichi, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	30,000	Chiba, Japan	B.E.P.C.	1972
Nippon Petroleum Refining Co., Ltd.	15,000	Muroran, Japan	B.E.P.C.	1973
Fuji Oil Co., Ltd.	30,000	Sodegaura, Japan	B.E.P.C.	1976
Toa Oil Co., Ltd.	46,000	Kawasaki, Japan	E.P.C.	1976
Seibu Oil Co., Ltd.	18,000	Yamaguchi, Japan	B.E.P.C.	1976
Mitsubishi Oil Co., Ltd.	17,000	Kawasaki, Japan	E.P.C.	1979
China National Technical Import Corp. (CNTIC)	17,000	Qilu, China	B.E.P.CS.M.T.	1982
State Organization for Oil Projects (SCOP)	31,000	Baiji, Iraq	B.E.P.C.M.T.	1983
Petromin Shell Refinery Co.	43,000	Al-Jubail, Saudi Arabia	E.P.C.M.T.	1985
The New Zealand Refining Co., Ltd.	Re. 6,600 (from 5,900)	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
JX Nippon Oil & Energy Corporation	13,000 (from 11,000)	Mizushima, Japan	E.P.C.	2013

#### Deep Desulfurization Units (Gas Oil)

Mitsubishi Oil Co., Ltd.	16,000	Kawasaki, Japan	B.E.P.C.	1991
Idemitsu Kosan Co., Ltd.	25,000	Hyogo, Japan	B.E.P.C.	1992
Nihonkai Oil Co., Ltd.	13,000	Toyama, Japan	E.P.C.	1993
Shell Eastern Petroleum Pte. Ltd. (SEPL)	45,000	Pulau Ular, Singapore	B.E.P.C.	1994
Showa Shell Sekiyu K.K.	27,000	Kawasaki, Japan	B.E.P.C.	1995
Toa Oil Co., Ltd.	20,000	Kawasaki, Japan	E.P.C.M.	1996
Koa Oil Co., Ltd.	20,000	Osaka, Japan	E.P.C.M.	1996
Japan Energy Corporation	35,000	Mizushima, Japan	B.E.P.C.M.	1996
Seibu Oil Co., Ltd.	30,000	Yamaguchi, Japan	E.P.C.M.	1996
Mitsubishi Oil Co., Ltd.	Re. 20,000 (from 16,000)	Kawasaki, Japan	B.E.P.C.M.	1996
Idemitsu Kosan Co., Ltd.	20,000	Tokuyama, Japan	E.P.C.	1996
Cosmo Oil Co., Ltd.	25,000	Sakai, Japan	E.P.C.	1996
Showa Yokkaichi Sekiyu Co., Ltd.	28,000	Yokkaichi, Japan	E.P.C.	1996
Yukong Ltd.	60,000	Ulsan, Korea	E.P.C.	1996
Thai Oil Co., Ltd.	37,000 x 2	Sriracha, Thailand	E.P.C.	1998
Malaysian Refining Co., Sdn. Bhd. (MRC)	35,000	Melaka, Malaysia	E.P.C.M.	1998
Petróleos de Venezuela S.A. (PDVSA)	38,000	Puerto La Cruz, Venezuela	E.P.C.M.	2004

#### Ultra Deep Desulfurization Units (Gas Oil)

Nippon Petroleum Refining Co., Ltd. (Former Koa Oil Co., Ltd.)	Re. 21,000 (from 18,000)	Marifu, Japan	B.E.P.C.	2002
Taiyo Oil Co., Ltd.	30,000	Kikuma, Japan	B.E.P.C.	2002
Kashima Oil Co., Ltd.	27,000	Kashima, Japan	B.E.P.	2007
Shell Eastern Petroleum Ltd. (SEPL)	60,000	Bukom Island, Singapore	E.P.C.M.	2012
Seibu Oil Co., Ltd.	5,000	Yamaguchi, Japan	B.E.P.C.	2013



Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
<b>Naphtha/Kerosene - Gas Oil</b>				
Mitsubishi Oil Co., Ltd.	12,000	Mizushima, Japan	B.E.P.C.	1961
Showa Sekiyu K.K.	12,000	Niigata, Japan	B.E.P.C.	1963
Showa Sekiyu K.K.	13,000	Niigata, Japan	B.E.P.C.	1966
General Petroleum & Mineral Organization (PETROMIN)	3,700	Jeddah, Saudi Arabia	E.P.C.	1967
Taiyo Oil Co., Ltd.	12,000	Kikuma, Japan	B.E.P.C.	1971
Okinawa Sekiyu Seisei Co., Ltd.	20,000	Okinawa, Japan	B.E.P.C.	1972
Mobil Oil Singapore Pte. Ltd.	20,000	Jurong, Singapore	E.P.C.	1973
Shell Eastern Petroleum Pte. Ltd. (SEPL)	6,000	Pulau Ular, Singapore	B.E.P.C.	1990

## Vacuum Gas Oil Hydrodesulfurization Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Nippon Petroleum Refining Co., Ltd.	3,500	Kudamatsu, Japan	B.E.P.C.	1964
Nippon Oil Co., Ltd.	3,500	Niigata, Japan	B.E.P.C.	1965
Fuji Oil Co., Ltd.	23,000	Sodegaura, Japan	B.E.P.C.M.	1968
Maruzen Oil Co., Ltd.	35,000	Chiba, Japan	B.E.P.C.	1969
Showa Sekiyu K.K.	14,000	Kawasaki, Japan	B.E.P.C.	1969
Seibu Oil Co., Ltd.	4,000	Yamaguchi, Japan	B.E.P.C.	1970
Koa Oil Co., Ltd.	8,000	Marifu, Japan	E.P.C.	1970
General Sekiyu K.K.	31,000	Sakai, Japan	E.P.C.	1970
Kansai Oil Co., Ltd.	20,000	Sakai, Japan	E.P.C.	1971
Koa Oil Co., Ltd.	12,000	Osaka, Japan	B.E.P.C.	1971
Asia Oil Co., Ltd.	17,200	Sakaide, Japan	B.E.P.C.	1972
Showa Yokkaichi Sekiyu Co., Ltd.	40,000	Yokkaichi, Japan	B.E.P.C.	1972
Tohoku Oil Co., Ltd.	35,000	Sendai, Japan	B.E.P.C.	1973
General Petroleum & Mineral Organization (PETROMIN)	6,600	Riyadh, Saudi Arabia	B.E.P.C.	1974
Fuji Oil Co., Ltd.	35,000	Sodegaura, Japan	B.E.P.C.	1976
Toa Oil Co., Ltd.	46,000	Kawasaki, Japan	E.P.C.	1976
China National Technical Import Corp. (CNTIC)/ China Petrochemical Co. (SINOPEC)	17,000	Qilu, China	B.E.P.CS.M.T.	1982
China National Technical Import and Export Corp. (CNTIC)	15,500	Nanjing, China	B.E.P.CS.M.T.	1988
Kyung In Energy Co., Ltd.	30,000	Inchon, Korea	B.E.PS.CS.M.	1991
Koa Oil Co., Ltd.	25,000	Marifu, Japan	B.E.P.C.	1993
Nihonkai Oil Co., Ltd.	*13,000	Toyama, Japan	E.P.C.	1993
Slovnaft a.s.	22,000	Bratislava, Slovakia	E.P.C.	1999
Nippon Petroleum Refining Co., Ltd.	21,000	Osaka, Japan	E.P.C.	2004

Note:\*VGO and Gas Oil Deep Desulfurization Unit

## Hydrocracking Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
General Petroleum & Mineral Organization (PETROMIN)	6,300	Riyadh, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	27,500	Riyadh, Saudi Arabia	E.P.C.	1981
State Organization for Oil Projects (SCOP)	38,000	Baiji, Iraq	B.E.P.C.M.T.	1983
Idemitsu Kosan Co., Ltd.	15,000	Tomakomai, Japan	B.E.P.C.	1984
Petromin Shell Refinery Co.	40,900	Al-Jubail, Saudi Arabia	E.P.C.M.T.	1985
The New Zealand Refining Co., Ltd.	22,400	Whangarei, New Zealand	B.E.P.C.CS.M	1986
Thai Oil Co., Ltd.	17,000	Sriracha, Thailand	E.P.C.M.	1989
Mobil Oil Singapore Pte. Ltd.	23,000	Jurong, Singapore	E.P.C.	1990
Yukong Ltd.	30,000	Ulsan, Korea	B.E.PS.CS.M	1992
Thai Oil Co., Ltd.	22,300	Sriracha, Thailand	E.P.C.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)	28,500	Melaka, Malaysia	E.P.C.M.	1998
JX Nippon Oil & Energy Corporation	13,000 (from 11,000)	Mizushima, Japan	E.P.C.	2013
PDVSA Petroleo, S.A.	100,000	Puerto La Cruz, Venezuela	E.PS.CS.	(2018)

## Fluid Catalytic Cracking Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Daikyo Oil Co.	20,000 (for VGO)	Yokkaichi, Japan	B.E.P.C.	1972
General Petroleum & Mineral Organization (PETROMIN)	8,700 (for VGO)	Jeddah, Saudi Arabia	E.P.C.	1974
Corporación Estatal Petrolera Ecuatoriana	12,600 (for VGO)	Esmeraldas, Ecuador	E.P.C.	1976
Nigerian National Petroleum Corp. (NNPC)	21,000 (for VGO)	Kaduna, Nigeria	B.E.P.C.M.T.	1980
Petromin-Mobil Yanbu Refinery Co., Ltd.	66,000 (for VGO)	Yanbu, Saudi Arabia	E.P.C.	1984
Showa Yokkaichi Sekiyu Co., Ltd.	Re. 25,000 (from 17,200) (for VGO)	Yokkaichi, Japan	B.E.P.C.	1985
Daikyo Oil Co.Re.	24,000 (from 20,000) (for VGO+Residue Oil)	Yokkaichi, Japan	B.E.P.C.	1985
Seibu Oil Co., Ltd.	20,000 (for VGO)	Yamaguchi, Japan	B.E.P.C.	1986
Toa Oil Co., Ltd.	30,000 (for VGO)	Kawasaki, Japan	E.P.C.T.	1987
Corporación Estatal Petrolera Ecuatoriana	Re. 16,000 (from 12,000) (for VGO)	Esmeraldas, Ecuador	E.P.C.	1987
Nigerian National Petroleum Corp. (NNPC)	26,000 (for VGO)	Warri, Nigeria	E.P.C.T.	1987

## Fluid Catalytic Cracking Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Shell Eastern Petroleum Pte. Ltd. (SEPL)	28,200 (for Residue Oil)	Pulau Bukom, Singapore	B.E.P.C.	1990
Chinese Petroleum Corp.	25,000 (for Residue Oil)	Kaohsiung, Taiwan	B.E.P.C.CS.	1991
Shell Eastern Petroleum Pte. Ltd. (SEPL)	Re. —	Pulau Bukom, Singapore	E.P.C.	1992
Tohoku Oil Co., Ltd.	25,000 (for Residue Oil)	Sendai, Japan	E.P.C.	1992
Showa Yokkaichi Sekiyu Co., Ltd.	55,000 (for Residue Oil)	Yokkaichi, Japan	B.E.P.C.	1996
NEDO/SINOPEC/Qilu Petrochemical Corp. (Model Project of FCC Power Recovery Unit)	126,000 Nm <sup>3</sup> /h	Qilu, China	B.E.P.CS.M.	1996
Shell Eastern Petroleum Pte. Ltd. (SEPL)	Re. 34,300 (from 28,200) (for Residue Oil)	Pulau Ular, Singapore	E.P.C.	1996
Cosmo Oil Co., Ltd.	Re. 28,000 (from 24,000) for VGO + Resid.)	Yokkaichi, Japan	E.P.C.	2004
Toa Oil Co., Ltd.	Re. 42,000 (from 33,000) (for VGO)	Kawasaki, Japan	E.P.C.	2005
Shell Eastern Petroleum Pte. Ltd. (SEPL)	37,400 (from 34,300) (for Residue Oil)	Pulau Bukom, Singapore	B.E.P.CS	2010
Taiyo Oil Co., Ltd.	25,000 (for Residue Oil)	Kikuma, Japan	E.P.C.	2010
JX Nippon Oil & Energy Corporation	3,000 *(for Residue Oil)	Mizushima, Japan	E.P.C.	2011
Taiyo Oil Co., Ltd.	Re. 29,000 (from 25,000)	Kikuma, Japan	E.P.C.	2014
Showa Yokkaichi Sekiyu Co., Ltd.	61,000 (Partial Renewal)	Yokkaichi, Japan	E.P.C.	2017
PRPC Refinery and Cracker Sdn. Bhd.	70,000 x 2 (for Residue Oil)	Johor, Malaysia	E.P.C.C.	(2018)

\*High Severity FCC (HS-FCC) Process

## Residuum Hydrodesulfurization Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Nippon Mining Co., Ltd.	27,800	Mizushima, Japan	E.P.C.	1970
Okinawa Sekiyu Seisei Co., Ltd.	38,000	Okinawa, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	40,000	Hyogo, Japan	B.E.P.C.	1972
Mitsubishi Oil Co., Ltd.	45,000	Mizushima, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	50,000	Chita, Japan	B.E.P.C.M.	1975
Seibu Oil Co., Ltd.	45,000	Yamaguchi, Japan	B.E.P.C.	1976
Maruzen Oil Co., Ltd.	30,000 x 2	Chiba, Japan	B.E.P.C.	1977
Asia Oil Co., Ltd.	28,000	Sakaide, Japan	B.E.P.C.	1980
Nippon Petroleum Refining Co., Ltd.	25,000	Muroran, Japan	B.E.P.C.M.	1982
Chinese Petroleum Corp.	30,000	Toa-Yuan, Taiwan	E.P.C.CS.M.T.	1985
Chinese Petroleum Corp.	15,000	Toa-Yuan, Taiwan	E.P.C.CS.M.T.	1989
Yukong Ltd.	30,000	Ulsan, Korea	B.E.PS.CS.M.	1992
Idemitsu Kosan Co., Ltd.	50,000	Chita, Japan	B.E.P.C.M.	1992
Chinese Petroleum Corp.	30,000	Kaohsiung, Taiwan	E.P.C.CS.M.	1992
Nippon Petroleum Refining Co., Ltd.	30,000	Negishi, Japan	B.E.P.C.	1993
Nghi Son Refinery Petrochemical Ltd.	105,000	Nghi Son, Vietnam	E.P.C.	2017

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Idemitsu Kosan Co., Ltd.	35,000	Tomakomai, Japan	B.E.P.C.	1994
Mitsubishi Oil Co., Ltd.	45,000 (Retrofit)	Mizushima, Japan	B.E.P.C.M.	1995
Tohoku Oil Co., Ltd.	45,000	Sendai, Japan	B.E.P.C.M.	1996
Tonen Corp.	25,000	Kawasaki, Japan	E.P.C.	1997
Seibu Oil Co., Ltd.	5,000 (Revamp)	Yamaguchi, Japan	B.E.P.C.	2014
Seibu Oil Co., Ltd.	50,000 (Retrofit)	Yamaguchi, Japan	B.E.P.C.	2016

#### OCR-Onstream Catalyst Replacement\*

Idemitsu Kosan Co., Ltd.	50,000	Chita, Japan	B.E.P.C.M.	1992
Idemitsu Kosan Co., Ltd.	35,000	Tomakomai, Japan	B.E.P.C.	1994
Mitsubishi Oil Co., Ltd.	45,000	Mizushima, Japan	B.E.P.C.M.	1995

Note:\*Remove metals from Resid. HDS feed by adding and removing demetalation catalyst while remaining onstream.

## Visbreaking Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
General Petroleum & Mineral Organization (PETROMIN)	3,200	Jeddah, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	2,800	Riyadh, Saudi Arabia	E.P.C.	1974
Corporación Estatal Petrolera Ecuatoriana	12,600	Esmeraldas, Ecuador	E.P.C.	1976
Mobil Oil Singapore Pte. Ltd.	50,000	Jurong, Singapore	B.E.P.C.	1982
Nippon Petroleum Refining Co., Ltd.	20,000	Negishi, Japan	B.E.P.C.	1983
Petromin-Mobil Yanbu Refinery Co., Ltd.	40,000	Yanbu, Saudi Arabia	E.P.C.	1984
Potromin Shell Refinery Co.	30,000	Al-Jubail, Saudi Arabia	E.P.C.M.T.	1985
Corporación Estatal Petrolera Ecuatoriana	12,600	Esmeraldas, Ecuador	E.P.C.	1987

## Thermal Cracking Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Summit Industrial Corp.	10,000	Bangchak, Thailand	E.P.CS.	1968
Eureka Chemical Industry Co., Ltd.	21,000	Sodegaura, Japan	B.E.P.C.	1974
China National Technical Import and Export Corp. (CNTIC)	20,000	Nanjing, China	B.E.P.CS.M.	1988
Thai Oil Co., Ltd.	Re. 18,800 (from 12,000)	Sriracha, Thailand	E.P.C.M.	1989
Fuji Oil Co., Ltd.	Re. 24,000 (from 21,000)	Sodegaura, Japan	E.P.C.	1994
Malaysian Refining Co., Sdn. Bhd. (MRC)	21,000	Melaka, Malaysia	E.P.C.M.	1998
Fuji Oil Co., Ltd.	Re. 30,000 (from 24,000)	Sodegaura, Japan	E.P.C.	2009
Saudi Aramco Total Refining and Petrochemical Co.	103,000	Al-Jubail, Saudi Arabia	E.P.C.	2013

## Solvent Deasphalting Units (Propane Deasphalting is excluded.)

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
General Petroleum & Mineral Organization (PETROMIN)	10,000	Riyadh, Saudi Arabia	E.P.C.	1981
The New Zealand Refining Co., Ltd.	16,000	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
Nippon Petroleum Refining Co., Ltd.	20,000	Mizushima, Japan	E.P.C.	2009

## Sweetening Units (Caustic Treating)

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
<b>LPG</b>				
General Petroleum & Mineral Organization (PETROMIN)	1,400	Riyadh, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	2,900	Jeddah, Saudi Arabia	E.P.C.	1974
Corporación Estatal Petrolera Ecuatoriana	2,200	Esmeraldas, Ecuador	E.P.C.	1976
General Petroleum & Mineral Organization (PETROMIN)	6,700	Riyadh, Saudi Arabia	E.P.C.	1981
General Petroleum & Mineral Organization (PETROMIN)	3,500	Yanbu, Saudi Arabia	E.P.C.M.	1983
Showa Yokkaichi Sekiyu Co., Ltd.	11,600	Yokkaichi, Japan	B.E.P.C.	1985
Seibu Oil Co., Ltd.	6,160	Yamaguchi, Japan	E.P.C.	1986
Toa Oil Co., Ltd.	7,200	Kawasaki, Japan	B.E.P.C.	1987
Shell Eastern Petroleum Pte. Ltd. (SEPL)	9,000 10,000	Pulau Ular, Singapore	B.E.P.C.	1990
Chinese Petroleum Corp.	7,200	Kaohsiung, Taiwan	E.P.C.CS.M.	1990
Nigeria National Petroleum Corp. (NNPC)	6,300	Kaduna, Nigeria	E.P.C.	1991
Kyung In Energy Co., Ltd.	10,000	Inchon, Korea	B.E.PS.CS.M.	1991
Tohoku Oil Co., Ltd.	6,600	Sendai, Japan	E.P.C.	1992
Yukong Ltd.	3,850	Ulsan, Korea	B.E.PS.CS.M.	1992
The Banchak Petroleum Co., Ltd.	3,000	Bangkok, Thailand	E.P.C.	1993
Showa Yokkaichi Sekiyu Co., Ltd.	11,100 7,400	Yokkaichi, Japan	B.E.P.C.	1996
Yukong Ltd.	10,000	Ulsan, Korea	B.E.P.C.M.	1996
National Iranian Oil Co. (NIOC)	4,800 x 2	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)	8,500	Melaka, Malaysia	E.P.C.M.	1998
Taiyo Oil Co., Ltd.	Undisclosed	Kikuma, Japan	E.P.C.	2010
Saudi Aramco Total Refining and Petrochemical Co.	8,353	Al-Jubail, Saudi Arabia	E.P.C.	2013

### Naphtha/Gasoline

Kashima Oil Co., Ltd.	5,000	Kashima, Japan	E.P.C.	1968
Tohoku Oil Co., Ltd.	5,000	Sendai, Japan	E.P.C.	1971
Mitsubishi Oil Co., Ltd.	10,000	Kawasaki, Japan	E.P.C.	1971
Daikyo Oil Co.	13,000	Yokkaichi, Japan	E.P.C.	1972

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
General Petroleum & Mineral Organization (PETROMIN)	6,000	Riyadh, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	6,000	Jeddah, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	13,100	Jeddah, Saudi Arabia	E.P.C.	1974
Corporación Estatal Petrolera Ecuatoriana	9,400	Esmeraldas, Ecuador	E.P.C.	1976
Nigerian National Petroleum Corp. (NNPC)	12,700	Kaduna, Nigeria	B.E.P.C.M.T.	1980
General Petroleum & Mineral Organization (PETROMIN)	4,000	Riyadh, Saudi Arabia	E.P.C.	1981
General Petroleum & Mineral Organization (PETROMIN)	12,000	Yanbu, Saudi Arabia	E.P.C.M.	1983
Seibu Oil Co., Ltd.	9,000 5,500	Yamaguchi, Japan	B.E.P.C.	1986
National Iranian Oil Co. (NIOC)	6,000	Lavan Is., Iran	E.P.C.	1986
Toa Oil Co., Ltd.	12,000 8,000	Kawasaki, Japan	E.P.C.	1987
Corporación Estatal Petrolera Ecuatoriana	Re. 10,600 (from 9,400)	Esmeraldas, Ecuador	E.P.C.	1987
Chinese Petroleum Corp.	16,200	Kaohsiung, Taiwan	E.P.C.CS.M.	1990
Shell Eastern Petroleum Pte. Ltd. (SEPL)	7,000	Pulau Ular, Singapore	B.E.P.C.	1990
Tohoku Oil Co., Ltd.	15,100	Sendai, Japan	E.P.C.	1992
Showa Yokkaichi Sekiyu Co., Ltd.	20,400 13,200	Yokkaichi, Japan	B.E.P.C.	1996
National Iranian Oil Co. (NIOC)	3,000 36,000	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)	15,200	Melaka, Malaysia	E.P.C.M.	1998
<b>Kerosene</b>				
Mobil Oil Singapore Pte. Ltd.	17,000	Jurong, Singapore	B.E.P.C.	1982
General Petroleum & Mineral Organization (PETROMIN)	7,000	Yanbu, Saudi Arabia	E.P.C.M.	1983
Petromin-Mobil Yanbu Refinery Co., Ltd.	40,000	Yanbu, Saudi Arabia	E.P.C.	1984
Mobil Oil Singapore Pte. Ltd.	10,000	Jurong, Singapore	E.P.C.	1987
Kyung In Energy Co., Ltd.	5,500	Inchon, Korea	B.E.PS.CS.M.	1991
Thai Oil Co., Ltd.	19,000	Sriracha, Thailand	E.P.C.M.	1993
Malaysian Refining Co., Sdn. Bhd. (MRC)	13,800	Melaka, Malaysia	E.P.C.M.	1998
<b>Jet Fuel</b>				
General Petroleum & Mineral Organization (PETROMIN)	6,000	Riyadh, Saudi Arabia	E.P.C.	1974
Corporación Estatal Petrolera Ecuatoriana	1,520	Esmeraldas, Ecuador	E.P.C.	1976
Corporación Estatal Petrolera Ecuatoriana	14,400	Esmeraldas, Ecuador	E.P.C.	1987

## Alkylation Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Petromin-Mobil Yanbu Refinery Co., Ltd.	12,500	Yanbu, Saudi Arabia	E.P.C.	1984
Shell Eastern Petroleum Pte. Ltd. (SEPL)	3,800	Pulau Ular, Singapore	E.P.C.	1990
Pemex-Refinacion	7,677	Tula, Mexico	E.P.C.	1997
Pemex-Refinacion	14,145	Salina Cruz, Mexico	E.P.C.	1997
Fuji Oil Co., Ltd.	4,000	Sodegaura, Japan	E.P.C.	1997

## Isomerization Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Toa Oil Co., Ltd.	2,500	Kawasaki, Japan	E.P.C.	1971
Fuji Oil Co., Ltd.	1,900	Sodegaura, Japan	E.P.C.	1971
Showa Sekiyu K.K.	6,000	Kawasaki, Japan	E.P.C.	1975
Showa Yokkaichi Sekiyu Co., Ltd.	5,500 #1	Yokkaichi, Japan	E.P.C.	1984
Seibu Oil Co., Ltd.	5,100 #2	Yamaguchi, Japan	E.P.C.	1990
Showa Yokkaichi Sekiyu Co., Ltd.	10,000 #3	Yokkaichi, Japan	E.P.C.	1990
Chinese Petroleum Corp.	6,000	Tao-yuan, Taiwan	E.P.	1991
Thai Oil Co., Ltd.	2,250 T/D	Sriracha, Thailand	E.P.C.	1995
Malaysian Refining Co., Sdn. Bhd. (MRC)	9,000	Melaka, Malaysia	E.P.C.M.	1998

Note: #1 Revamping Kerosene smoke point improver.

#2 Modification of Platformer to Hysomer.

#3 Revamping Hysomer by adding Isosiv.

## Distillate Dewaxing Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
China National Technical Import Corp. (CNTIC)	4,500	Qilu, China	B.E.P.CS.M.T.	1982
Mobil Oil Singapore Pte. Ltd.	12,000 (Modification)	Jurong, Singapore	E.P.C.	1990
Seibu Oil Co., Ltd.	3,000	Yamaguchi, Japan	E.P.C.	1994

# Hydrogen Manufacturing Units

\*PSA:Pressure Swing Adsorp

Client	Capacity (Nm <sup>3</sup> /Hr)	Location	Scope of Work	Year of Completion
Mitsubishi Oil Co., Ltd.	19,500	Mizushima, Japan	B.E.P.C.M.	1966
Mitsubishi Petrochemical Co., Ltd.	14,000	Yokkaichi, Japan	B.E.P.C.M.	1967
Fuji Oil Co., Ltd.	13,800	Sodegaura, Japan	B.E.P.C.M.	1968
Summit Industrial Corp.	5,250	Bangchak, Thailand	B.E.P.CS.M	1968
Toa Nenryo Kogyo K.K.	18,700	Wakayama, Japan	B.E.P.C.M.	1968
Maruzen Oil Co., Ltd.	25,000	Chiba, Japan	B.E.P.C.M.	1969
Koa Oil Co., Ltd.	7,400	Marifu, Japan	B.E.P.C.M.	1970
Nippon Mining Co., Ltd.	31,200	Mizushima, Japan	B.E.P.C.M.	1970
Esso Singapore Private Ltd.	3,800	Pulau Ayer, Chawan Is. Singapore	E.P.C.	1970
Kansai Oil Co., Ltd.	12,500	Sakai, Japan	B.E.P.C.M.	1971
Toa Nenryo Kogyo K.K.	22,900 x 2	Kawasaki, Japan	B.E.P.C.M.	1971
Okinawa Sekiyu Seisei Co., Ltd.	50,000	Okinawa, Japan	B.E.P.C.M.	1972
Asia Oil Co., Ltd.	12,500	Sakaide, Japan	B.E.P.C.M.	1972
Idemitsu Kosan Co., Ltd.	39,600	Hyogo, Japan	B.E.P.C.M.	1972
Kyushu Oil Co., Ltd.	16,700	Ohita, Japan	B.E.P.C.M.	1972
Mitsubishi Oil Co., Ltd.	43,300	Mizushima, Japan	B.E.P.C.M.	1972
Mobil Oil Singapore Pte. Ltd.	2,700	Jurong, Singapore	E.P.C.	1973
Nippon Mining Co., Ltd. / Maruzen Oil Co., Ltd.	34,000	Mizushima, Japan	B.E.P.C.M.	1973
General Petroleum & Mineral Organization (PETROMIN)	7,440	Jeddah, Saudi Arabia	E.P.C.M.	1974
General Petroleum & Mineral Organization (PETROMIN)	18,470	Riyadh, Saudi Arabia	E.P.C.	1974
Idemitsu Kosan Co., Ltd.	68,750	Chita, Japan	B.E.P.C.M.	1975
Fuji Oil Co., Ltd.	22,500	Sodegaura, Japan	B.E.P.C.M.	1976
Toa Oil Co., Ltd.	38,800	Kawasaki, Japan	B.E.P.C.M.	1976
Seibu Oil Co., Ltd.	50,000	Yamaguchi, Japan	E.P.C.	1976
Maruzen Oil Co., Ltd.	36,700 x 2	Chiba, Japan	E.P.C.	1977
Asia Oil Co., Ltd.	25,000	Sakaide, Japan	B.E.P.C.M.	1980
General Petroleum & Mineral Organization (PETROMIN)	83,300	Riyadh, Saudi Arabia	E.P.C.	1981
Nippon Peroxide Co.	*2,000	Kohriyama, Japan	B.E.P.C.M.	1981
Alexandria Petroleum Co.	*1,210	Alexandria, Egypt	B.E.P.C.M.	1982
Nippon Petroleum Refining Co., Ltd.	44,700	Muroran, Japan	B.E.P.C.M.	1982
State Organization for Oil Projects (SCOP)	74,000	Baiji, Iraq	B.E.P.C.M.T.	1983
Petromin Shell Refinery Co.	122,790	Al-Jubail, Saudi Arabia	B.E.P.C.M.T.	1985
Perwaja Trengganu Sdn. Bhd.	80,000	Trengganu, Malaysia	B.E.P.CS.M.T.	1985
Chinese Petroleum Corp.	*39,000	Tao-Yuan, Taiwan	E.P.CS.	1985
The New Zealand Refining Co., Ltd.	65,000	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
Taiyo Oil Co., Ltd.	*17,000	Kikuma, Japan	E.P.C.	1988
Chinese Petroleum Corp.	*19,000	Tao-Yuan, Taiwan	E.P.C.	1989
Thai Oil Co., Ltd.	*36,100	Sriracha, Thailand	E.P.C.M.	1989
Mobil Oil Singapore Pte. Ltd.	*27,900	Jurong, Singapore	E.P.C.	1990
Yukong Ltd.	*76,000	Ulsan, Korea	B.E.PS.CS.M.	1992
Idemitsu Kosan Co., Ltd.	*62,500	Tomakomai, Japan	E.P.C.	1994
Tohoku Oil Co., Ltd.	*67,000	Sendai, Japan	B.E.P.C.M.	1996
Yukong Ltd.	*84,100	Ulsan, Korea	E.P.C.	1996
Tonen Corp.	Re. 29,624 (from 22,900)	Kawasaki, Japan	E.P.C.	1997
Thai Oil Co., Ltd.	38,960	Sriracha, Thailand	E.P.C.	1998



\*PSA:Pressure Swing Adsorp

Client	Capacity (Nm <sup>3</sup> /Hr)	Location	Scope of Work	Year of Completion
Malaysian Refining Co., Sdn. Bhd. (MRC)	*13,400	Melaka, Malaysia	E.P.C.M.	1998
Slovnaft a.s.	*38,219	Bratislava, Slovakia	B.E.P.C.	1999
NEDO (HiCOT PJ)	Demo. Plan 625	Tsurumi, Japan	E.P.C.M.	2001
Koa Oil Co., Ltd.	*20,000	Osaka, Japan	E.P.C.	2002
Cosmo Oil Co., Ltd.	36,700 (Replacing reformers tubes)	Chiba, Japan	E.P.C.	2014
Laffan Refinery Company Limited 2	15,500	Ras Laffan, Qatar	E.P.C.	2016

## Sulfur Recovery Units

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
Showa Sekiyu K.K.	100	Kawasaki, Japan	E.P.C.	1969
Kharg Chemical Co., Ltd.	585	Kharg Is., Iran	E.P.C.	1969
Seibu Oil Co., Ltd.	30	Yamaguchi, Japan	E.P.C.	1970
Nippon Mining Co., Ltd.	150	Mizushima, Japan	B.E.P.C.	1970
Esso Singapore Private Ltd.	20	Pulau Ayer, Chawan Is. Singapore	E.P.C.	1970
Okinawa Sekiyu Seisei Co., Ltd.	150 x 2	Okinawa, Japan	B.E.P.C.	1972
Fuji Kosan Co., Ltd.	20	Kainan, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	30	Tomakomai, Japan	B.E.P.C.	1972
Shell Eastern Petroleum Pte. Ltd. (SEPL)	34	Bukom, Singapore	E.P.C.	1972
Mitsubishi Oil Co., Ltd.	150 x 2	Mizushima, Japan	E.P.C.	1972
Nippon Mining Co., Ltd./Maruzen Oil Co., Ltd.	70	Mizushima, Japan	B.E.P.C.	1973
Mobil Oil Singapore Pte. Ltd.	20	Jurong, Singapore	E.P.C.	1973
Tohoku Oil Co., Ltd.	90	Sendai, Japan	E.P.C.	1973
Koa Oil Co., Ltd.	35	Marifu, Japan	B.E.P.C.	1974
Fuji Oil Co., Ltd.	150	Sodegaura, Japan	B.E.P.C.	1976
Seibu Oil Co., Ltd.	155 x 2	Yamaguchi, Japan	B.E.P.C.	1976
Maruzen Oil Co., Ltd.	150	Chiba, Japan	E.P.C.	1977
Nigerian National Petroleum Corp. (NNPC)	20	Kaduna, Nigeria	B.E.P.C.M.T.	1980
Mobil Oil Singapore Pte. Ltd.	55 x 2	Jurong, Singapore	E.P.C.	1982
China National Technical Import Corp. (CNTIC) /China Petroleum Co. (SINOPEC)	262	Qilu, China	B.E.P.CS.M.T.	1982
State Organization for Oil Projects (SCOP)	227	Baiji, Iraq	B.E.P.C.M.T.	1983
Petromin-Mobil Yanbu Refinery Co., Ltd.	150 x 2	Yanbu, Saudi Arabia	E.P.C.	1984
Idemitsu Kosan Co., Ltd.	20	Tomakomai, Japan	B.E.P.C.	1984
Petromin Shell Refinery Co.	90 x 3	Al-Jubail, Saudi Arabia	E.P.C.M.	1985
The New Zealand Refining Co., Ltd.	53.4 x 3	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
Chinese Petroleum Corp.	94.7	Tao-Yuan, Taiwan	E.P.C.CS.	1989
Thai Oil Co., Ltd.	57.5 x 2	Sriracha, Thailand	E.P.C.M.	1989
Kyung In Energy Co., Ltd.	35	Inchon, Korea	B.E.PS.CS.M.	1991
Chinese Petroleum Corp.	100 x 2	Kaohsiung, Taiwan	E.P.C.	1992
Yukong Ltd.	200 x 2	Ulsan, Korea	B.E.PS.CS.M.	1992
Koa Oil Co., Ltd.	140	Marifu, Japan	B.E.P.C.M.	1993

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
Tohoku Oil Co., Ltd.	200 x 2	Sendai, Japan	B.E.P.C.M.	1996
Yukong Ltd.	100	Ulsan, Korea	E.P.C.	1996
Thai Oil Co., Ltd.	140 x 2	Sriracha, Thailand	E.P.C.M.	1997
National Iranian Oil Co. (NIOC)	130	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)	100 x 2	Melaka, Malaysia	E.P.C.M.	1998
Koa Oil Co., Ltd.	180	Osaka, Japan	E.P.C.	2002
Petróleos de Venezuela S.A. (PDVSA)	50 x 2	Puerto la Cruz, Venezuela	E.P.C.M.	2004
Taiyo Oil Co., Ltd.	Undisclosable	Kikuma, Japan	E.P.C.	2010
Seibu Oil Co., Ltd.	Re. 340	Yamaguchi, Japan	B.E.P.C.	2012
Shell Eastern Petroleum Ltd. (SEPL)	180	Bukom Island, Singapore	E.P.C.M.	2012

## Claus Tail Gas Treating Units

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
Mitsubishi Oil Co., Ltd.	300	Mizushima, Japan	B.E.P.C.	1972
Fuji Kosan Co., Ltd.	20	Kainan, Japan	B.E.P.C.	1972
Nippon Mining Co., Ltd./Maruzen Oil Co., Ltd.	150	Mizushima, Japan	B.E.P.C.	1973
Tohoku Oil Co., Ltd.	90	Sendai, Japan	B.E.P.C.	1973
Seibu Oil Co., Ltd.	310	Yamaguchi, Japan	B.E.P.C.	1976
China National Technical Import Corp. (CNTIC)/ China Petrochemical Co. (SINOPEC)	262	Qilu, China	B.E.P.CS.M.T.	1982
Nippon Mining Co., Ltd.	150	Mizushima, Japan	B.E.P.C.	1984
Chinese Petroleum Corp.	95	Tao-Yuan, Taiwan	B.E.P.C.	1989
Tohoku Oil Co., Ltd.	75	Sendai, Japan	B.E.P.C.	1989
Kyung In Energy Co., Ltd.	35	Inchon, Korea	B.E.PS.CS.M.	1991
Yukong Ltd.	400	Ulsan, Korea	B.E.PS.CS.M.	1992
Chinese Petroleum Corp.	100	Kaohsiung, Taiwan	E.P.C.	1992
Koa Oil Co., Ltd.	140	Marifu, Japan	B.E.P.C.M.	1993
Nippon Petroleum Refining Co., Ltd.	170	Negishi, Japan	B.E.P.C.	1993
Nihonkai Oil Co., Ltd.	40	Toyama, Japan	B.E.P.C.	1993
Showa Shell Sekiyu K.K.	16	Kawasaki, Japan	B.E.P.C.	1995
Yukong Ltd.	100	Ulsan, Korea	B.E.P.C.	1996
Tohoku Oil Co., Ltd.	400	Sendai, Japan	B.E.P.C.M.	1996
Petróleos de Venezuela S.A. (PDVSA)	100	Puerto la Cruz, Venezuela	E.P.C.M.	2004
Shell Eastern Petroleum Ltd. (SEPL)	480	Bukom Island, Singapore	E.P.C.M.	2012

## H<sub>2</sub>S Removal Units with Amine

Client	Capacity (Nm <sup>3</sup> /Day)	Location	Scope of Work	Year of Completion
Asia Oil Co., Ltd.	11,500	Yokohama, Japan	E.P.C.	1962
Showa Sekiyu K.K.	229,000	Kawasaki, Japan	E.P.C.	1964
Showa Yokkaichi Sekiyu Co., Ltd.	400,000	Yokkaichi, Japan	E.P.C.	1965
General Sekiyu Seisei K.K.	118,000	Sakai, Japan	E.P.C.	1965
Mitsubishi Oil Co., Ltd.	29,000	Mizushima, Japan	E.P.C.	1966
Fuji Oil Co., Ltd.	145,000	Sodegaura, Japan	E.P.C.	1968
Seibu Oil Co., Ltd.	125,000	Yamaguchi, Japan	E.P.C.	1968
Toa Oil Co., Ltd.	326,400	Kawasaki, Japan	E.P.C.	1968
Showa Sekiyu K.K.	123,100	Kawasaki, Japan	E.P.C.	1969
Maruzen Oil Co., Ltd.	190,300	Chiba, Japan	E.P.C.	1969
Nippon Mining Co., Ltd.	584,800	Mizushima, Japan	E.P.C.	1969
Esso Singapore Private Ltd.	120,000	Pulau Ayer, Chawan Is., Singapore	E.P.C.	1970
General Sekiyu Seisei K.K.	117,900	Sakai, Japan	E.P.C.	1970
Nippon Mining Co., Ltd.	5,156,000	Mizushima, Japan	E.P.C.	1970
Idemitsu Kosan Co., Ltd.	6,899,000	Hyogo, Japan	E.P.C.	1970
Esso Standard Okinawa K.K.	—	Nishibaru, Japan	E.P.C.	1970
Kansai Oil Co., Ltd.	755,000	Sakai, Japan	E.P.C.	1971
Mitsubishi Oil Co., Ltd.	170,000	Kawasaki, Japan	E.P.C.	1971
Okinawa Sekiyu Seisei Co., Ltd.	232,000	Okinawa, Japan	E.P.C.	1972
Daikyo Oil Co.	139,000	Yokkaichi, Japan	E.P.C.	1972
Abu Dhabi National Oil Co. (ADNOC)	188,000	Mubarras Is., Abu Dhabi	E.P.C.	1973
Mitsubishi Oil Co., Ltd.	7,395,000	Mizushima, Japan	E.P.C.	1973
Mobil Oil Singapore Pte. Ltd.	3,300	Jurong, Singapore	E.P.C.	1973
Tohoku Oil Co., Ltd.	2,280,000	Sendai, Japan	E.P.C.	1973
General Petroleum & Mineral Organization (PETROMIN)	128,000	Jeddah, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	214,000	Riyadh, Saudi Arabia	E.P.C.	1974
Koa Oil Co., Ltd.	320,000	Marifu, Japan	E.P.C.	1974
Idemitsu Kosan Co., Ltd.	13,691,000	Chiba, Japan	E.P.C.	1975
Fuji Oil Co., Ltd.	3,148,000	Sodegaura, Japan	E.P.C.	1976
Seibu Oil Co., Ltd.	5,717,000	Yamaguchi, Japan	E.P.C.	1976
Koa Oil Co., Ltd.	3,670,000	Marifu, Japan	E.P.C.	1976
Eureka Chemical Industry Co., Ltd.	131,000	Sodegaura, Japan	E.P.C.	1976
Corporación Estatal Petrolera Ecuatoriana	250,000	Esmeraldas, Ecuador	E.P.C.	1976
Maruzen Oil Co., Ltd.	7,720,000	Chiba, Japan	E.P.C.	1977
Asia Kyoseki Oil Co., Ltd.	182,000	Sakaide, Japan	E.P.C.	1980
General Petroleum & Mineral Organization (PETROMIN)	GAS 2,906,800 LPG 40,000 T/Y	Riyadh, Saudi Arabia	E.P.C.	1981
General Petroleum & Mineral Organization (PETROMIN)	GAS 150,000 LPG 12,800 T/Y	Yanbu, Saudi Arabia	E.P.C.	1983
Nippon Petroleum Refining Co., Ltd.	74,900	Negishi, Japan	E.P.C.	1983
Fuji Kosan Co., Ltd.	26,000	Kainan, Japan	E.P.C.	1983
Fuji Oil Co., Ltd.	1,312,000	Sodegaura, Japan	E.P.C.	1984
Asia Oil Co., Ltd.	3,609,336	Sakaide, Japan	E.P.C.	1985
Seibu Oil Co., Ltd.	130,900	Yamaguchi, Japan	E.P.C.	1986
Toa Oil Co., Ltd.	GAS 164,790 LPG 248,000 T/Y	Kawasaki, Japan	E.	1987

Client		Capacity (Nm <sup>3</sup> /Day)	Location	Scope of Work	Year of Completion
Chinese Petroleum Corp.		3,840,000	Tao Yuan, Taiwan	E.P.C.	1989
Thai Oil Co., Ltd.	GAS LPG	7,013,000 23,000 T/Y	Sriracha, Thailand	E.P.C.	1989
Shell Eastern Petroleum Pte. Ltd. (SEPL)	GAS LPG	359,000 237,000 T/Y	Pulau Ular, Singapore	E.P.C.	1989
Chinese Petroleum Corp.		2,350,000	Tao Yuan, Taiwan	E.P.C.	1989
Chinese Petroleum Corp.	GAS LPG	249,000 214,000 T/Y	Kaohsiung, Taiwan	E.P.	1990
Kyung In Energy Co., Ltd.	GAS LPG	1,230,000 358,000 T/Y	Inchon, Korea	E.P.	1991
Nippon Mining Co., Ltd.		14,145	Mizushima, Japan	E.P.C.	1992
Tohoku Oil Co., Ltd.	GAS LPG	252,800 191,000 T/Y	Sendai, Japan	E.P.C.	1992
Yukong Ltd	GAS LPG	6,680,000 146,000 T/Y	Ulsan, Korea	E.P.	1992
Chinese Petroleum Corp.		4,527,200	Kaohsiung, Taiwan	E.P.C.	1992
Thai Oil Co., Ltd.	GAS LPG	68,000 87,300 T/Y	Sriracha, Thailand	E.P.C.	1993
Nippon Petroleum Refining Co., Ltd.		414,000	Negishi, Japan	E.P.C.	1993
Nihonkai Oil Co., Ltd.		1,070,600	Toyama, Japan	E.P.C.	1993
Koa Oil Co., Ltd.	GAS LPG	3,281,000 492,000 T/Y	Marifu, Japan	E.P.C.	1993
Tohoku Oil Co., Ltd.		9,049,800	Sendai, Japan	E.P.C.M.	1996
Showa Yokkaichi Sekiyu Co., Ltd.	GAS LPG	655,800 197,000 T/Y	Yokkaichi, Japan	E.P.C.M.	1996
Thai Oil Co., Ltd.	GAS LPG	416,000 44,000 T/Y	Sriracha, Thailand	E.P.C.M.	1997
National Iranian Oil Co. (NIOC)	GAS LPG	730,000 267,000 T/Y	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Malaysian Refining Co., Sdn. Bhd. (MRC)		225,000	Melaka, Malaysia	E.P.C.M.	1998
Petróleos de Venezuela S.A. (PDVSA)	GAS	388,360	Puerto la Cruz, Venezuela	E.P.C.M.	2004
Kashima Oil Co., Ltd.	GAS	1,996,000	Kashima, Japan	B.E.P.	2007
Japan Energy Corporation.	GAS LPG	1,000,000 410 T/D	Mizushima, Japan	B.	2009
Taiyo Oil Co., Ltd.		Undisclosed	Kikuma, Japan	E.P.C.	2010
Shell Eastern Petroleum Ltd. (SEPL)	GAS	2,530,000	Bukom Island, Singapore	E.P.C.M.	2012
Laffan Refinery Company Limited 2	GAS LPG	133,000 312,000 T/Y	Ras Laffan, Qatar	E.P.C.	2016

## Sour Water Stripping Units

Client		Capacity (Tons/Hr)	Location	Scope of Work	Year of Completion
General Sekiyu Seisei K.K.		9.1	Sakai, Japan	B.E.P.C.	1967
Toa Oil Co., Ltd.		35.1	Kawasaki, Japan	B.E.P.C.	1968
Nippon Petroleum Refining Co., Ltd.		81.3	Negishi, Japan	B.E.P.C.	1968
Fuji Oil Co., Ltd.		5.2	Sodegaura, Japan	B.E.P.C.	1968
Fuji Oil Co., Ltd.		52.0	Sodegaura, Japan	B.E.P.C.	1968

Client	Capacity (Tons/Hr)	Location	Scope of Work	Year of Completion
Fuji Oil Co., Ltd.	38.8	Sodegaura, Japan	B.E.P.C.	1968
Seibu Oil Co., Ltd.	33.1	Yamaguchi, Japan	B.E.P.C.	1968
Showa Sekiyu K.K.	30.5	Kawasaki, Japan	B.E.P.C.	1969
Maruzen Oil Co., Ltd.	13.7	Chiba, Japan	B.E.P.C.	1969
Mitsubishi Oil Co., Ltd.	17.8	Mizushima, Japan	B.E.P.C.	1969
Koa Oil Co., Ltd.	23.7	Marifu, Japan	B.E.P.C.	1970
Cosmo Oil Co., Ltd.	2.4	Shimizu, Japan	B.E.P.C.	1970
Kansai Oil Co., Ltd.	53.4	Sakai, Japan	B.E.P.C.	1970
Kansai Oil Co., Ltd.	11.6	Sakai, Japan	B.E.P.C.	1970
Kashima Oil Co., Ltd.	28.6	Kashima, Japan	B.E.P.C.	1971
Chinese Petroleum Corp.	33.0	Kaohsiung, Taiwan	B.E.P.C.	1971
Koa Oil Co., Ltd.	59.0	Osaka, Japan	B.E.P.C.	1971
Mitsubishi Oil Co., Ltd.	22.0	Kawasaki, Japan	B.E.P.C.	1971
Daikyo Oil Co.	5.9	Yokkaichi, Japan	B.E.P.C.	1972
Kyushu Oil Co., Ltd.	86.0	Ohita, Japan	B.E.P.C.	1972
Mitsubishi Oil Co., Ltd.	67.0	Mizushima, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	33.0	Tomakomai, Japan	B.E.P.C.	1972
Okinawa Sekiyu Seisei Co., Ltd.	11.6	Okinawa, Japan	B.E.P.C.	1972
Okinawa Sekiyu Seisei Co., Ltd.	11.5	Okinawa, Japan	B.E.P.C.	1972
Nippon Petroleum Refining Co., Ltd.	11.0	Negishi, Japan	B.E.P.C.	1973
Taiyo Oil Co., Ltd.	32.0	Kikuma, Japan	B.E.P.C.	1973
Mitsubishi Oil Co., Ltd.	52.6	Mizushima, Japan	B.E.P.C.	1973
Tohoku Oil Co., Ltd.	69.5	Sendai, Japan	B.E.P.C.	1973
Tohoku Oil Co., Ltd.	18.5	Sendai, Japan	B.E.P.C.	1973
Nihonkai Oil Co., Ltd.	30.0	Toyama, Japan	B.E.P.C.	1974
Idemitsu Kosan Co., Ltd.	25.0	Hyogo, Japan	B.E.P.C.	1974
Asia Kyoseki Oil Co., Ltd.	10.6	Sakaide, Japan	B.E.P.C.	1974
Idemitsu Kosan Co., Ltd.	50.0	Chita, Japan	B.E.P.C.	1975
Seibu Oil Co., Ltd.	52.8	Yamaguchi, Japan	B.E.P.C.	1975
Fuji Oil Co., Ltd.	15.9	Sodegaura, Japan	B.E.P.C.	1975
Fuji Oil Co., Ltd.	25.0	Sodegaura, Japan	B.E.P.C.	1975
Fuji Kosan Co., Ltd.	16.0	Kainan, Japan	B.E.P.C.	1976
Fuji Kosan Co., Ltd.	24.0	Kainan, Japan	B.E.P.C.	1976
Toa Oil Co., Ltd.	57.0	Kawasaki, Japan	B.E.P.C.	1976
Toa Oil Co., Ltd.	69.3	Kawasaki, Japan	B.E.P.C.	1976
Maruzen Oil Co., Ltd.	60.0 x 2	Chiba, Japan	B.E.	1976
US Oil	1.9	Tacoma, U.S.A.	B.E.	1980
Nigerian National Petroleum Corp. (NNPC) (in FCC Unit)	16.1	Kaduna, Nigeria	B.E.P.C.	1980
Nigerian National Petroleum Corp. (NNPC) (in Refinery w/o FCC Unit)	55.0 x 2	Kaduna, Nigeria	B.E.P.C.	1980
China National Technical Import Corp. (CNTIC)/ China Petrochemical Co. (SINOPEC)	7.0	Qilu, China	B.E.P.CS.M.T.	1982
State Organization for Oil Projects (SCOP)	110.0	Baiji, Iraq	E.P.C .	1983
Petromin-Mobil Yanbu Refinery Co., Ltd.	55.5 x 2	Yanbu, Saudi Arabia	E.P.C .	1984
Seibu Oil Co., Ltd.	16.9	Yamaguchi, Japan	B.E.P.C.	1986
The New Zealand Refining Co., Ltd.	36.9 35.2	Whangarei, New Zealand	B.E.P.C.CS.M.	1986
China National Technical Import and Export Corp. (ECN-Project; HT)	7.0	Nanjing, China	B.E.P.CS.M.T.	1988

Client	Capacity (Tons/Hr)	Location	Scope of Work	Year of Completion
China National Technical Import and Export Corp. (ECN-Project; EUREKA)	70.0	Nanjing, China	B.E.P.CS.M.T.	1988
Thai Oil Co., Ltd.	45.2 59.5	Sriracha, Thailand	E.P.C.M.	1989
Chinese Petroleum Corp.	15.5	Kaohsiung, Taiwan	E.P.C.	1992
Yukong Ltd.	30.0 x 2	Ulsan, Korea	B.E.PS.CS.M.	1992
Idemitsu Kosan Co., Ltd.	41.0	Tomakomai, Japan	B.E.P.C.	1994
Yukong Ltd.	50.0	Ulsan, Korea	E.P.C.	1996
Tohoku Oil Co., Ltd.	60.0	Sendai, Japan	B.E.P.C.M.	1996
Showa Yokkaichi Sekiyu Co., Ltd.	41.0	Yokkaichi, Japan	E.P.C.M.	1996
Thai Oil Co., Ltd.	45.0	Sriracha, Thailand	E.P.C.M.	1997
National Iranian Oil Co. (NIOC)	75.0 x 2	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Thai Oil Co., Ltd.	21.7	Sriracha, Thailand	E.P.C.	1998
Malaysian Refining Co., Sdn. Bhd. (MRC)	55.8	Melaka, Malaysia	E.P.C.M.	1998
Petróleos de Venezuela S.A. (PDVSA)	59.0	Puerto la Cruz, Venezuela	E.P.C.M.	2004
Kyushu Oil Co., Ltd.	Re 100.0 (from 86.0)	Ohita, Japan	E.P.C.	2006
Taiyo Oil Co., Ltd.	Undisclosable	Kikuma, Japan	E.P.C.	2010
Laffan Refinery Company Limited 2	20.0	Ras Laffan, Qatar	E.P.C.	2016

## Blown Asphalt (Bitumen) Units

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
Mitsubishi Oil Co., Ltd.	48	Kawasaki, Japan	B.E.P.C.	1952
Showa Kako Co., Ltd.	20	Tokyo, Japan	E.P.C.	1960
Mitsubishi Oil Co., Ltd.	154	Kawasaki, Japan	B.E.P.C.	1965
Mitsubishi Oil Co., Ltd.	380	Mizushima, Japan	E.P.C.	1966
Maruzen Oil Co., Ltd.	80	Chiba, Japan	B.E.P.C.	1967
General Petroleum & Mineral Organization (PETROMIN)	53	Jeddah, Saudi Arabia	B.E.P.C.	1967
Esso Singapore Private Ltd.	668	Pulau Ayer, Chawan Is., Singapore	E.P.C.	1970
Mitsubishi Oil Co., Ltd.	200	Mizushima, Japan	B.E.P.C.	1973
Jeddah Oil Refinery Co.	191	Jeddah, Saudi Arabia	E.P.C.	1974
General Petroleum & Mineral Organization (PETROMIN)	900 BPSD	Jeddah, Saudi Arabia	E.P.C.	1974
Corporación Esatatal Petrolera Ecuatoriana	200	Esmeraldas, Ecuador	E.P.C.	1976
Nigerian National Petroleum Corp. (NNPC)	2,700	Kaduna, Nigeria	B.E.P.C.M.T.	1980
Arabian America Oil Co. (Aramco)	10,000 BPSD	Ras Tanura, Saudi Arabia	E.P.C.	1986

## Condensate Splitter Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Shell Eastern Petroleum Pte. Ltd./Petrochemical Corporation of Singapore (Pte). Ltd. (PCS)	70,000	Pulau Bukom, Singapore	B.E.P.C.	2000
Laffan Refinery Company Limited 2	146,000	Ras Laffan, Qatar	E.P.C.	2016

## Lubricating Oil Refining Units

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
<b>Vacuum Distillation Unit</b>				
Mitsubishi Oil Co., Ltd.	3,500	Kawasaki, Japan	B.E.P.C.	1957
Mitsubishi Oil Co., Ltd.	3,500	Kawasaki, Japan	B.E.P.C.	1962
Mitsubishi Oil Co., Ltd.	17,000	Mizushima, Japan	B.E.P.C.	1967
Fuji Kosan Co., Ltd.	14,000	Kainan, Japan	B.E.P.C.	1972
Nippon Mining Co., Ltd./Maruzen Oil Co., Ltd.	27,000	Mizushima, Japan	B.E.P.C.	1973
Petromin Lubricating Oil Refining Co.	21,600	Jeddah, Saudi Arabia	C.	1977
Nigerian National Petroleum Corp. (NNPC)	23,000	Kaduna, Nigeria	B.E.P.C.M.T.	1980
Alexandria Petroleum Co.	23,200	Alexandria, Egypt	E.P.C.	1982
Saudi Aramco Lubricating Oil Refining Co. (LUBEREF)	25,300	Yanbu, Saudi Arabia	E.P.C.	1997

### Propane Deasphalting Unit

Nippon Mining Co., Ltd. / Maruzen Oil Co., Ltd.	4,300	Mizushima, Japan	B.E.P.C.	1973
Petromin Lubricating Oil Refining Co.	4,550	Jeddah, Saudi Arabia	C.	1977
Nigerian National Petroleum Corp. (NNPC)	11,000	Kaduna, Nigeria	E.P.C.	1980
Petromin Lubricating Oil Refining Co.	27,825	Riyadh, Saudi Arabia	E.P.C.	1981
Alexandria Petroleum Co.	7,810	Alexandria, Egypt	E.P.C.	1982
Saudi Aramco Lubricating Oil Refining Co. (LUBEREF)	6,290	Yanbu, Saudi Arabia	E.P.C.	1997

### Solvent Extraction Unit

Mitsubishi Oil Co., Ltd.	430	Kawasaki, Japan	B.E.P.C.	1955
Daikyo Oil Co.	1,100	Yokkaichi, Japan	B.E.P.C.	1957
Nippon Petroleum Refining Co., Ltd.	730	Yokohama, Japan	B.E.P.C.	1957
Daikyo Oil Co.	2,100	Yokkaichi, Japan	B.E.P.C.	1962
Nippon Mining Co., Ltd.	700	Funakawa, Japan	B.E.P.C.	1963
Mitsubishi Oil Co., Ltd.	4,000	Mizushima, Japan	B.E.P.C.	1967
Nippon Petroleum Refining Co., Ltd.	7,200	Negishi, Japan	B.E.P.C.	1968
Mitsubishi Oil Co., Ltd.	Re. 7,400	Mizushima, Japan	B.E.P.C.	1972
Nippon Mining Co., Ltd. / Maruzen Oil Co., Ltd.	9,000	Mizushima, Japan	B.E.P.C.	1973
Petromin Lubricating Oil Refining Co.	6,400	Jeddah, Saudi Arabia	C.	1977
Nigerian National Petroleum Corp. (NNPC)	10,500	Kaduna, Nigeria	E.P.C.M.	1980

Client	Capacity (BPSD)	Location	Scope of Work	Year of Completion
Alexandria Petroleum Co.	3,690	Alexandria, Egypt	E.P.C.	1982
Saudi Aramco Lubricating Oil Refining Co. (LUBEREF)	13,330	Yanbu, Saudi Arabia	E.P.C.	1997

#### Lube/Wax Hydrofinishing and Catalytic Dewaxing Units

Mitsubishi Oil Co., Ltd.	2,800 (Lube)	Mizushima, Japan	B.E.P.C.	1967
Maruzen Oil Co., Ltd.	2,300 (Lube)	Shimotsu, Japan	B.E.P.C.	1970
Fuji Kosan Co., Ltd.	5,000 (Lube)	Kainan, Japan	B.E.P.C.	1972
Mitsubishi Oil Co., Ltd.	4,600 (Lube)	Mizushima, Japan	B.E.P.C.	1972
Nippon Mining Co., Ltd. / Maruzen Oil Co., Ltd.	5,000 (Lube)	Mizushima, Japan	B.E.P.C.	1973
Nigerian National Petroleum Corp. (NNPC)	75 T/D (Wax)	Kaduna, Nigeria	E.P.C.M.	1980
Alexandria Petroleum Co.	33 T/D (Wax)	Alexandria, Egypt	E.P.C.	1982
Alexandria Petroleum Co.	2,130 (Lube)	Alexandria, Egypt	E.P.C.	1982
Qilu Petrochemical Corp.	4,800 (MLDW)	Qilu, China	B.E.P.CS.M.T.	1982
Sankyo Yuka Kogyo K.K.	1,870 (Lube)	Ichikawa, Japan	E.P.C.	1995
Saudi Aramco Lubricating Oil Refining Co. (LUBEREF)	8,490 (MLDW)	Yanbu, Saudi Arabia	E.P.C.	1997

#### Solvent Dewaxing Unit

Nippon Mining Co., Ltd.	600	Funakawa, Japan	B.E.P.C.	1950
Mitsubishi Oil Co., Ltd.	80 (Wax)	Kawasaki, Japan	B.E.P.C.	1953
Mitsubishi Oil Co., Ltd.	600	Kawasaki, Japan	B.E.P.C.	1955
Daikyo Oil Co.	1,130	Yokkaichi, Japan	B.E.P.C.	1963
Daikyo Oil Co.	1,800	Yokkaichi, Japan	B.E.P.C.	1964
Mitsubishi Oil Co., Ltd.	2,400	Mizushima, Japan	B.E.P.C.	1967
Mitsubishi Oil Co., Ltd.	Re. 5,300	Mizushima, Japan	B.E.P.C.	1972
Nippon Mining Co., Ltd. / Maruzen Oil Co., Ltd.	5,000	Mizushima, Japan	B.E.P.C.	1973
Petromin Lubricating Oil Refining Co.	3,855	Jeddah, Saudi Arabia	C.	1977
Nigerian National Petroleum Corp. (NNPC)	7,100 (Dewaxing)	Kaduna, Nigeria	E.P.C.M.	1980
Nigerian National Petroleum Corp. (NNPC)	840 (Deoiling)	Kaduna, Nigeria	E.P.C.M.	1980
Alexandria Petroleum Co.	2,610	Alexandria, Egypt	E.P.C.	1982



Client	Capacity (KI/Year)	Location	Scope of Work	Year of Completion
<b>Lube Oil Blending Unit</b>				
Mitsubishi Oil Co., Ltd.	10,500	Kawasaki, Japan	E.P.C.	1953
Showa Sekiyu K.K.	100,000	Yokohama, Japan	E.P.C.	1963
Mitsubishi Oil Co., Ltd.	45,000	Yokohama, Japan	E.P.C.	1966
Idemitsu Oil Co., Ltd.	200,000	Chiba, Japan	E.P.C.	1966
Mitsubishi Oil Co., Ltd.	100,000	Mizushima, Japan	E.P.C.	1967
Nippon Mining Co., Ltd.	60,000	Sodegaura, Japan	E.P.C.	1968
Mitsubishi Oil Co., Ltd.	70,000	Mizushima, Japan	E.P.C.	1972
Fuji Kosan Co., Ltd.	72,000	Kainan, Japan	E.P.C.	1972
Idemitsu Kosan Co., Ltd.	80,000	Chiba, Japan	E.P.C.	1985
Mobil Oil Hong Kong Ltd.	80,000	Tsing-Yi, Hong Kong	E.P.C.	1993
Mobil Oil Hong Kong Ltd.	— (Modification)	Tsing-Yi, Hong Kong	B.E.P.C.	1996
Mobil Petroleum (Tianjin) Co., Ltd.	48,000	Tianjin, China	B.E.P.C.	1997
Esso (Tianjin) Co., Ltd.	40,000	Tianjin, China	B.E.P.C.	1998
Showa Shell Sekiyu K.K.	133,500	Yokohama, Japan	B.E.P.C.	1998
Esso (Zhejiang) Co., Ltd.	40,000	Ningbo, China	B.E.P.C.	1998
Nippon Petroleum Refining Co., Ltd.	—	Kanagawa, Japan	E.P.C.	2006

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Grease Plant</b>				
Showa Sekiyu K.K.	Re. 9,000 (from 6,000)	Tsurumi, Japan	E.P.C.	1978
Mobil Petroleum (Tianjin) Co., Ltd.	4,000	Tianjin, China	B.E.P.C.	1997
Nippon Petroleum Refining Co., Ltd.	—	Kanagawa, Japan	E.P.C.	2006

<b>Truck Loading</b>				
TonenGeneral Sekiyu K.K.	—	Kawasaki, Japan	E.P.C.	2016



# Petrochemical and Chemical Plants



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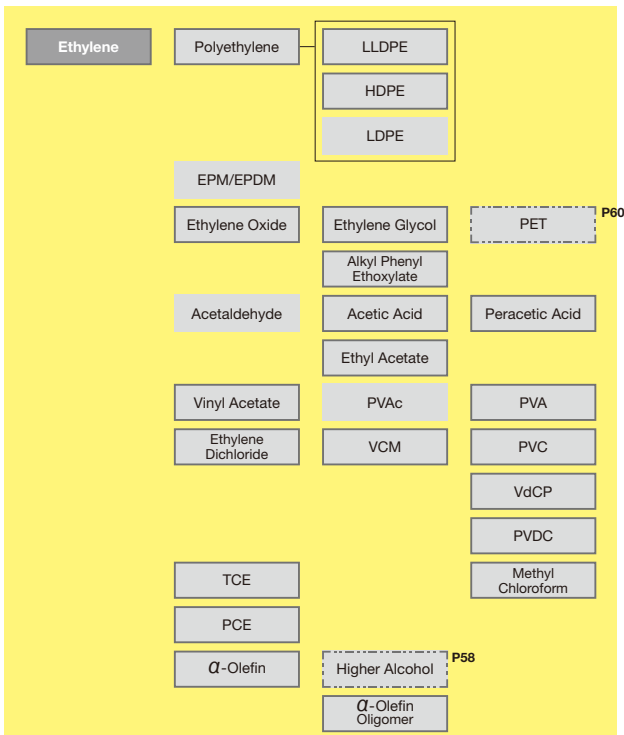
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<b>Scope of Work</b>	F: FEED/FEL (Front End Loading)
	B: Basic Design
	E: Engineering
	P: Procurement
	PS: Procurement Service
	C: Construction and Start-up Assistance
	CS: Construction Supervision
	S: Field Supervision
	M: Start-up and Commissioning
	T: Training

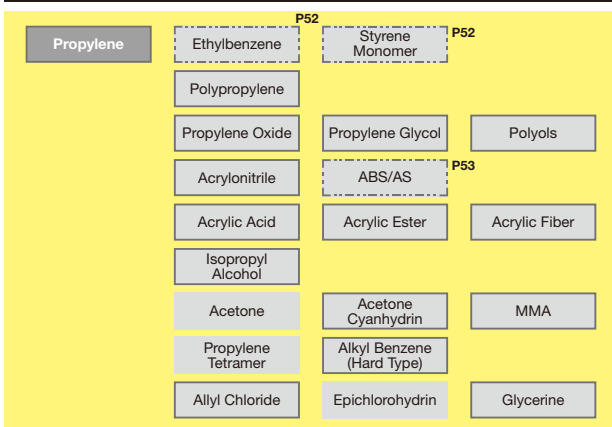
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<b>Remarks</b>	Re: Revamping
	Ex: Expansion

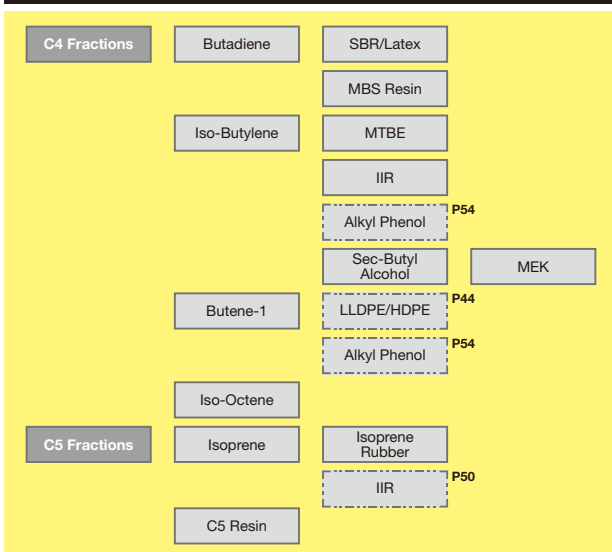
## Ethylene and Its Derivatives



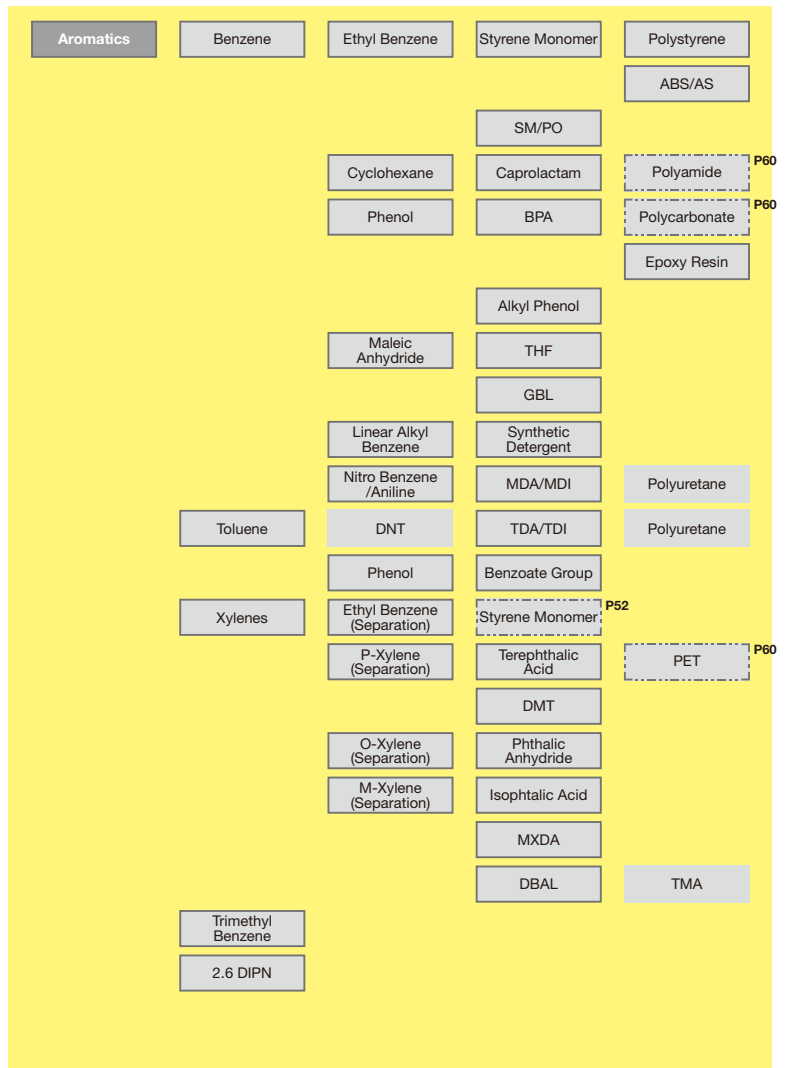
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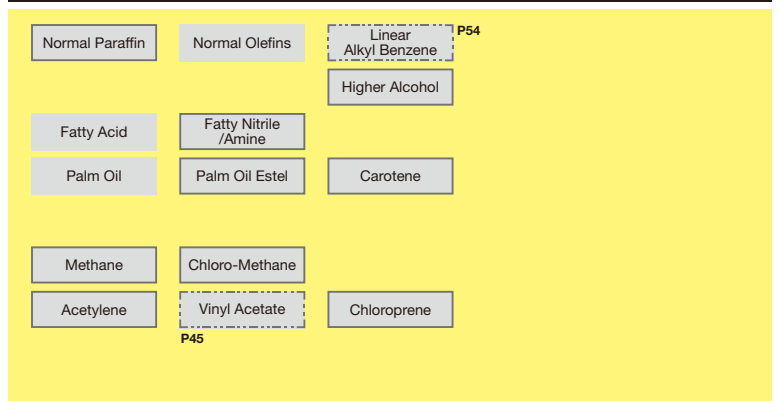
## C4/C5 Fractions and Derivatives



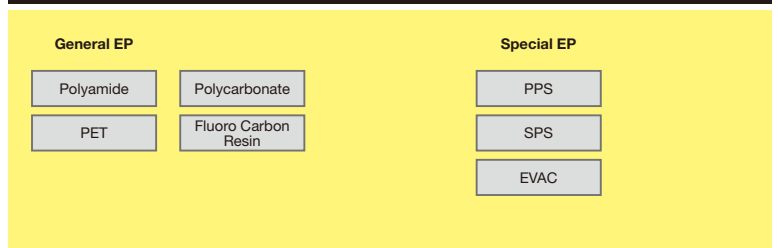
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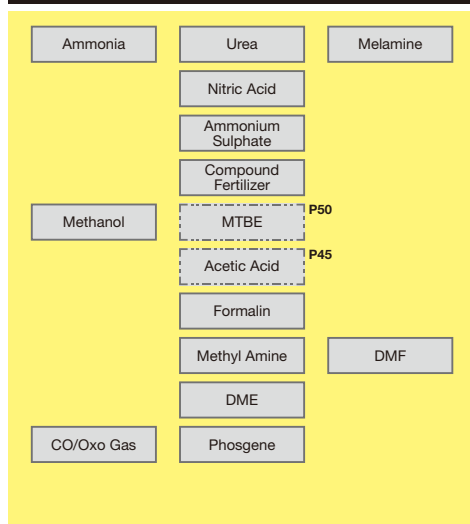
## Paraffin/Methane/Acetylene Derivatives/Oleo Chemicals



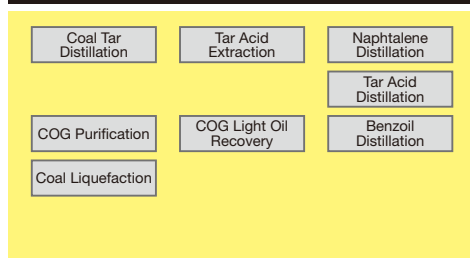
## Engineering Plastics



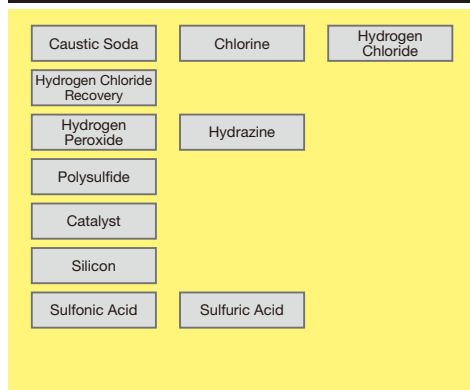
### Synthesis Gas/Fertilizers



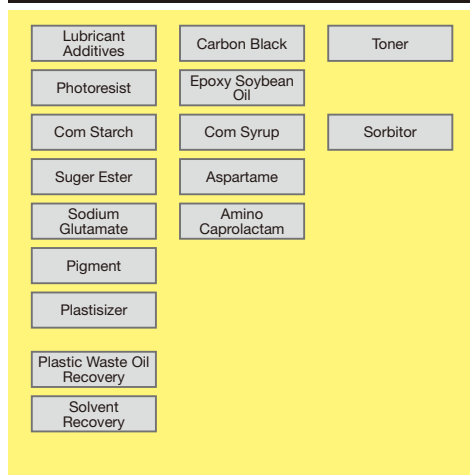
### Coal Chemicals





### Inorganic Chemicals



### Others



 Processes on which Chiyoda has experience  
 Shows as other feed derivatives in the list

ABS	Acrylonitrile-Butadiene Copolymer
AS	Acrylonitrile-Styrene Copolymer
BPA	Bisphenol-A
DBAL	Dimethyl-Benzaldehyde
2.6DIPN	2.6 Diisopropylnahthalane
DME	Dimethyl Ether
DMF	Dimethylformamide
DMT	Dimethyl Telephthalate
DNT	Dinitrotoluene
EPM/EPDM	Ethylene-Propylene/Ethylene Propylene Diene Terpolymer
EVA C	Ethylene Vinylalcohol Copolymer
GBL	$\gamma$ -Butyrolactone
HDPE	High Density Polyethylene
IIR	Isobutylene-Isoprene Rubber
LDPE	Low Density Polyethylene
LLDPE	Linear Low Density Polyethylene
MBS	MMA-Butadiene-Styrene Copolymer
MDA/MDI	Methylene Dianiline/Diphenylmethane Diisocyanate
MEK	Methyl Ethyl Ketone
MMA	Methyl Methacrylate Monomer
MTBE	Methyl Tertiary Butyl Ether
MXDA	Meta-Xylenediamine
PCE	Perchloroethylene
PET	Polyethylene Telephthalate
PPS	Polyphenylene Sulfide
PVA	Polyvinyl Alcohol
PVAc	Polyvinyl Acetate
PVC	Polyvinyl Chloride
PVDC	Poly-Vinylidene Chloride
SBR	Styrene Butadiene Rubber
SM/PO	Styrene Monomer/Propylene Oxide Coproduction
SPS	Syndiotactic Polystyrene
TCE	Trichloroethylene
TDA/TDI	Tolulene Diamine/Tolulene Diisosyanate
THF	Tetrahydrofuran
TMA	Trimellitic Acid
VCM	Vinyl Chloride Monomer
VdCM	Vinylidene Chloride Monomer
VdCP	Vinylchloride-Vinylidene Chloride Copolymer

# Ethylene and Its Derivatives

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Ethylene</b>				
Tonen Petrochemical Co.	40,000	Kawasaki, Japan	E.P.C. ※	1962
Kasei Mizushima Petrochemical Co., Ltd.	45,000	Mizushima, Japan	E.P.C.	1964
	Ex. 15,000	Mizushima, Japan	E.P.C. ※	1965
Tonen Petrochemical Co.	Ex. 60,000	Kawasaki, Japan	E.P.C. ※	1966
Kasei Mizushima Petrochemical Co., Ltd.	Ex. 100,000	Mizushima, Japan	E.P.C.	1967
Mitsubishi Petrochemical Co., Ltd.	200,000	Yokkaichi, Japan	E.P.C. ※	1968
Maruzen Petrochemical Co., Ltd.	300,000 (Hot Section)	Goi, Japan	E.P.C.	1969
Osaka Petrochemical Co., Ltd.	300,000	Sakai, Japan	E.P.C. ※	1969
Mizushima Ethylene Co., Ltd.	300,000	Mizushima, Japan	E.P.C.	1970
Mitsubishi Petrochemical Co., Ltd.	300,000	Kashima, Japan	E.P.C. ※	1970
Osaka Petrochemical Co., Ltd.	Ex. 100,000	Sakai, Japan	E.P.C. ※	1971
Shin-Daikyo Petrochemical Co., Ltd.	300,000	Yokkaichi, Japan	E.P.C.	1971
V/O Techmashimport	450,000	Nizhnekamsk, U.S.S.R.	E.P.S. ※	1973
Sonatrach	300,000	Algeria	E.P.S. ※	1973
Maruzen Petrochemical Co., Ltd.	Ex. 100,000	Chiba, Japan	E.P.C. ※	1973
Shin-Daikyo Petrochemical Co., Ltd.	Ex. 60,000	Yokkaichi, Japan	E.P.C. ※	1974
Mizushima Ethylene Co., Ltd.	Ex. 60,000	Mizushima, Japan	E.P.C. ※	1975
Union Carbide Corp.	Demo. Plant 2,000	Texas, U.S.A.	B.E.P.S.	1979
Shin-Daikyo Petrochemical Co., Ltd.	Ex. 60,000	Yokkaichi, Japan	E.P.C. ※	1980
Arabian Petrochemical Co. (PETROKEMYA)	500,000	Al-Jubail, Saudi Arabia	B.E.P.C.	1985
Maruzen Petrochemical Co., Ltd.	Ex. 40,000	Chiba, Japan	E.P.C. ※	1989
Tonen Chemical Co., Ltd.	Ex. 85,000	Kawasaki, Japan	E.P.C. ※	1990
Nigerian National Petroleum Corp. (NNPC)	300,000	Port Harcourt, Nigeria	B.E.P.C.M.T.	1995
Petrochemical Corporation of Singapore (Private) Ltd.	Offsite	Pulau Merbau, Singapore	E.P.C.	1996
Exxon Chemical Singapore Pte. Ltd.	800,000	Jurong, Singapore	E.P.C.	2000
Thai Olefins Public Co., Ltd. (TOC)	300,000	Rayong, Thailand	E.P.C.	2004
Jubail United Petrochemical Co.	1,000,000	Al-Jubail, Saudi Arabia	E.P.C.	2004
Mitsubishi Chemical Corp.	Ex. 150,000	Kashima, Japan	E.P.C. ※	2005
Jubail United Petrochemical Co.	Ex. 400,000	Al-Jubail, Saudi Arabia	E.P.C. ※	2006

※ Cracker Design and Fabrication

## Polyethylene

### Linear Low Density Polyethylene (LLDPE)

Eastern Petrochemical Co. (SHARQ)	130,000	Al-Jubail, Saudi Arabia	E.P.C.	1985
Samung General Chemicals Co., Ltd.	80,000	Daesan, Korea	E.	1993

### High Density Polyethylene (HDPE)

Kasei Mizushima Petrochemical Co., Ltd.	20,000	Mizushima, Japan	E.P.C.	1968
Kasei Mizushima Petrochemical Co., Ltd.	Ex. 10,000	Mizushima, Japan	E.P.C.	1970
Kasei Mizushima Petrochemical Co., Ltd.	60,000	Mizushima, Japan	E.P.C.	1973
Hyundai Petrochemical Co., Ltd.	100,000	Daesan, Korea	E.P.S.C.S.M.	1991

## Ethylene Oxide

Mitsubishi Petrochemical Co., Ltd.	5,000	Yokkaichi, Japan	E.P.C.	1960
Nisso Petrochemical Industries Co., Ltd.	12,000	Goi, Japan	E.P.C.	1964
Mitsubishi Petrochemical Co., Ltd.	12,000	Yokkaichi, Japan	E.	1964
Eastern Petrochemical Co. (SHARQ)	240,000	Al-Jubail, Saudi Arabia	E.P.C.	1985

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Ethylene Oxide</b>				
Eastern Petrochemical Co. (SHARQ)	240,000	Al-Jubail, Saudi Arabia	E.P.C.	1993
Eastern Petrochemical Co. (SHARQ)	360,000	Al-Jubail, Saudi Arabia	E.P.C.	2000
<b>Ethylene Glycol</b>				
Mitsubishi Petrochemical Co., Ltd.	4,000	Yokkaichi, Japan	E.P.C.	1960
Nisso Petrochemical Industries Co., Ltd.	15,000	Goi, Japan	E.P.C.	1964
Mitsubishi Petrochemical Co., Ltd.	9,000	Yokkaichi, Japan	E.	1964
Eastern Petrochemical Co. (SHARQ)	300,000	Al-Jubail, Saudi Arabia	E.P.C.	1985
Eastern Petrochemical Co. (SHARQ)	300,000	Al-Jubail, Saudi Arabia	E.P.C.	1993
Eastern Petrochemical Co. (SHARQ)	450,000	Al-Jubail, Saudi Arabia	E.P.C.	2000
China Man-Made Fiber Co.	400,000	Kaohsiung, Taiwan	B.	2005
Rabigh Refining and Petrochemical Company (PETRO Rabigh)	600,000	Rabigh, Saudi Arabia	B.	2005
Eastern Petrochemical Co. (SHARQ)	525,000	Al-Jubail, Saudi Arabia	B.	2011
<b>Alkyl Phenyl Ethoxylate (Nonionic Surfactant)</b>				
Lion Chemical Corp.	10,000	Kashima, Japan	E.P.C.	1994
<b>Acetic Acid</b>				
Mizushima Synthetic Chemical Co., Ltd.	50,000	Mizushima, Japan	E.P.C.	1964
Petrobras	—	Linhares, Brazil	E.L.	(Suspended)
<b>Peracetic Acid</b>				
Oxirane Chemical Co., Ltd.	2,780	Mie, Japan	B.E.P.C.	1969
Oxirane Chemical Co., Ltd.	Pilot Plant 150	Mie, Japan	B.E.P.C.	1973
<b>Ethyl Acetate</b>				
The Nippon Synthetic Chemical Industry Co., Ltd.	—	Ohgaki, Japan	B.E.P.C.	1961
Mizushima Synthetic Chemical Co., Ltd.	15,000	Mizushima, Japan	B.E.P.C.	1964
<b>Vinyl Acetate Monomer</b>				
The Nippon Synthetic Chemical Industry Co., Ltd.	9,000	Kumamoto, Japan	E.P.C.	1963
The Nippon Synthetic Chemical Industry Co., Ltd.	9,000	Ohgaki, Japan	E.P.C.	1963
The Nippon Synthetic Chemical Industry Co., Ltd.	21,600	Kumamoto, Japan	E.P.C.	1963
The Nippon Synthetic Chemical Industry Co., Ltd.	14,400	Ohgaki, Japan	E.P.C.	1964
Mizushima Synthetic Chemical Co., Ltd.	50,000	Mizushima, Japan	E.P.C.	1969
Mizushima Synthetic Chemical Co., Ltd.	Ex. 50,000	Mizushima, Japan	E.P.C.	1971
<b>Polyvinyl Alcohol (PVA)</b>				
The Nippon Synthetic Chemical Industry Co., Ltd.	—	Kumamoto, Japan	B.E.P.C.	1956
Denki Kagaku Kogyo Co., Ltd.	—	Oume, Japan	B.E.P.C.	1962
Mizushima Synthetic Chemical Co., Ltd.	12,000	Mizushima, Japan	B.E.P.C.	1967
Mizushima Synthetic Chemical Co., Ltd.	Ex. 12,000	Mizushima, Japan	B.E.P.C.	1970
The Nippon Synthetic Chemical Industry Co., Ltd.	12,000	Mizushima, Japan	E.C.	1992

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Ethylene Dichloride (EDC)</b>				
Kureha Chemical Industry Co., Ltd.	—	Nishiki, Japan	B.E.P.C.	1963
Mitsubishi Monsanto Chemical Co.	73,000	Yokkaichi, Japan	E.P.C.	1964
British Oxygen Chemicals Ltd.	51,000	Maydown, England	B.E.	1966
Asahi-Penn Chemical Co., Ltd.	58,500	Chiba, Japan	E.P.C.	1967
Kureha Chemical Industry Co., Ltd.	—	Nishiki, Japan	B.E.P.C.	1970
Asahi-Penn Chemical Co., Ltd.	Ex. 30,000	Chiba, Japan	E.P.C.	1972
Plastic Resins & Chemicals Inc.	—	Sahapuram, India	B.E.P.CS.	1972
V/O Techmashimport	—	Volgograd, U.S.S.R.	B.E.P.CS.	1973
PT. Asahimas Subentra Chemical (AMSC)	300,000	Anyer, Indonesia	B.E.P.C.	1989
<b>Vinyl Chloride Monomer (VCM)</b>				
Kureha Chemical Industry Co., Ltd.	30,000	Nishiki, Japan	B.E.P.C.	1963
Mitsubishi Monsanto Chemical Co.	43,000	Yokkaichi, Japan	E.P.C.	1964
Norsk Hydro-Electrisk Heroya	30,000	Heroya, Norway	B.E.	1966
Asahi-Penn Chemical Co., Ltd.	35,000	Chiba, Japan	E.P.C.	1967
Kureha Chemical Industry Co., Ltd.	120,000	Nishiki, Japan	B.E.P.C.	1970
Asahi-Penn Chemical Co., Ltd.	Ex. 15,000	Chiba, Japan	E.P.C.	1972
Plastic Resins & Chemicals Inc.	15,000	Sahapuram, India	B.E.P.CS.	1972
V/O Techmashimport	60,000	Volgograd, U.S.S.R.	B.E.P.CS.	1973
PT. Asahimas Subentra Chemical (AMSC)	150,000	Anyer, Indonesia	E.P.C.	1989
<b>Polyvinyl Chloride (PVC)</b>				
Plastic Resins & Chemicals Inc.	15,000	Sahapuram, India	B.E.PS.	1972
V/O Techmashimport	60,000	Volgograd, U.S.S.R.	B.E.PS.	1973
China National Technical Import and Export Corp. (CNTIC)	15,000	Fuzhou, China	B.E.P.CS.M.T.	1988
<b>Vinylchloride-Vinylidene Chloride Copolymer (VdCP)</b>				
Kureha Kasei Co., Ltd.	5,000	Nishiki, Japan	B.E.P.C.	1955
Kureha Chemical Co., Ltd.	Latex —	Nishiki, Japan	E.P.C.	1996
<b>Poly-Vinylidene Chloride (PVDC)</b>				
Nantong SKT New Material Co., Ltd.	—	Nantong, China	E.P.C.	2005
Kureha Corporation	—	Iwaki, Japan	E.P.C.	2014
<b>Methyl Chloroform (MC)</b>				
Asahi Glass Co., Ltd.	15,000	Chiba, Japan	E.P.C.	1979
<b>Trichloroethylene (TCE)</b>				
Asahi-Penn Chemical Co., Ltd.	10,000	Chiba, Japan	E.P.C.	1967
Asahi-Penn Chemical Co., Ltd.	Ex. 16,000	Chiba, Japan	E.P.C.	1972



Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Perchloroethylene (PCE)</b>				
Kureha Chemical Industry Co., Ltd.	6,000	Nishiki, Japan	E.P.C.	1962
Asahi-Penn Chemical Co., Ltd.	10,000	Chiba, Japan	E.P.C.	1967
Asahi-Penn Chemical Co., Ltd.	Ex. 16,000	Chiba, Japan	E.P.C.	1972

#### **α-Olefin**

Idemitsu Petrochemical Co., Ltd.	50,000	Chiba, Japan	F.	1987
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#### **α-Olefin Oligomer**

Lion Fat & Oil Co., Ltd.	180	Kawasaki, Japan	E.P.C.	1973
Lion Fat & Oil Co., Ltd.	400	Kawasaki, Japan	E.P.C.	1976

## Propylene and Its Derivatives

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Propane Dehydrogenation</b>				
Tongyang Nylon Co., Ltd.	165,000	Ulsan, Korea	E.PS.CS.	1992

#### **Polypropylene**

Mitsubishi Petrochemical Co., Ltd.	17,000	Yokkaichi, Japan	E.P.C.	1962	
Mitsubishi Petrochemical Co., Ltd.	18,000	Yokkaichi, Japan	E.P.C.	1966	
Mitsubishi Petrochemical Co., Ltd.	22,000	Yokkaichi, Japan	E.P.C.	1967	
Mitsubishi Petrochemical Co., Ltd.	48,000	Yokkaichi, Japan	E.P.C.	1968	
Mitsubishi Petrochemical Co., Ltd.	80,000	Yokkaichi, Japan	E.P.C.	1970	
NV Nederlandse Staats Mijnen (DSM)	50,000	The Netherlands	B.	1973	
NV Nederlandse Staats Mijnen (DSM)	100,000	The Netherlands	B.	1976	
Mitsubishi Petrochemical Co., Ltd.	60,000	Kashima, Japan	E.P.C.	1980	
HIPOL-Hemijska Industrija u Osnivanju	30,000	Odzachi, Yugoslavia	E.P.C.	1983	
Petkim Petrokimya A.S.	60,000	Aliaga, Turkey	E.P.C.	1985	
Polialden Petroquimica S.A.	BCP	50,000	Brazil	B.	1990
Polialden Petroquimica S.A.	HP	50,000	Brazil	B.	1990
Mitsubishi Chemical Industries, Ltd.	50,000	Mizushima, Japan	B.E.P.C.	1991	
Petroquimica Ensenada S.A. (PETROKEN)	100,000	Ensenada, Argentina	E.P.C.	1991	

#### **Propylene Oxide**

Showa Denko K.K.	2,200	Kawasaki, Japan	E.P.C.	1960
Showa Denko K.K.	4,800	Kawasaki, Japan	E.P.C.	1961
Showa Denko K.K.	12,000	Kawasaki, Japan	E.P.C.	1964

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Propylene Glycol</b>				
Showa Denko K.K.	1,800	Kawasaki, Japan	B.E.P.C.	1960
Showa Denko K.K.	2,200	Kawasaki, Japan	B.E.P.C.	1961
Asahi-Denkakogyo K.K.	15,000	Chiba, Japan	B.E.P.C.	1979
Seraya Chemicals Singapore (Pte.) Ltd.	30,000	Pulau Seraya, Singapore	E.P.C.	1997
CNOOC and Shell Petrochemicals Co., Ltd.	60,000	Huizhou, China	E.P.C.M.	2005
<b>Polyols</b>				
Seraya Chemicals Singapore (Pte.) Ltd.	78,000	Pulau Seraya, Singapore	E.P.C.	1997
CNOOC and Shell Petrochemicals Co., Ltd.	135,000	Huizhou, China	E.P.C.M.	2005
<b>Acrylonitrile</b>				
Asahi Chemical Co.	30,000	Kawasaki, Japan	E.P.C.	1963
Asahi Chemical Co.	Ex. 15,000	Nobeoka, Japan	E.P.C.	1965
<b>Acrylic Fiber</b>				
Ningbo Rayon Acrylic Fibers Co., Ltd.	—	Ningbo, China	E.P.	2005
<b>Acrylic Acid and Esters</b>				
Idemitsu Kosan Co., Ltd.	AA 30,000	Chita, Japan	B.E.P.C.	1991
Idemitsu Kosan Co., Ltd.	BA 15,000	Chita, Japan	B.E.P.C.	1991
Idemitsu Kosan Co., Ltd.	2EHA 15,000	Chita, Japan	B.E.P.C.	1991
<b>Isopropyl Alcohol</b>				
Shell Eastern Chemicals (Pte.) Ltd.	70,000	Pulau Ular, Singapore	E.P.C.	1990
<b>Acetone Cyanohydrin</b>				
Nitto Chemical Industry Co., Ltd.	32,400	Yokohama, Japan	B.E.P.C.	1968
Nitto Chemical Industry Co., Ltd.	32,400	Ohtake, Japan	B.E.P.C.	1971
<b>Methyl Methacrylate Monomer (MMA)</b>				
Mitsubishi Rayon Co., Ltd.	6,000	Ohtake, Japan	B.E.P.C.	1960
Mitsubishi Rayon Co., Ltd.	12,000	Ohtake, Japan	B.E.P.C.	1963
Mitsubishi Rayon Co., Ltd.	36,000	Yokohama, Japan	B.E.P.C.	1969
Mitsubishi Rayon Co., Ltd.	60,000	Osaka, Japan	B.E.P.C.	1971
<b>Polymethyl Methacrylate (PMMA) Sheet Plant</b>				
Mitsubishi Rayon Polymer Nantong Co., Ltd.	—	Nantong, China	E.P.C.	2005
Thai MMA Co., Ltd.	20,000	Rayong, Thailand	E.P.C. ※	2009

※ C: Chiyoda (Thailand) Limited.

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Alkyl Benzene (Hard Type)</b>				
Mitsubishi Petrochemical Co., Ltd.	15,000	Yokkaichi, Japan	E.P.C.	1962
Mitsubishi Petrochemical Co., Ltd.	20,000	Yokkaichi, Japan	E.P.C.	1965
<b>Alkyl Chloride</b>				
Kashima Chemical Industry Co., Ltd.	10,000	Kashima, Japan	B.E.	1970
<b>Synthetic Glycerine</b>				
Kashima Chemical Industry Co., Ltd.	10,000	Kashima, Japan	B.E.P.C.	1970

## C<sub>4</sub>/C<sub>5</sub> Fractions and Derivatives

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Butane Dehydrogenation</b>				
Qatar Fuel Additives Co., Ltd. (QAFAC)	390,000	Umm Said, Qatar	E.P.C.M.	1999
<b>Butadiene Extraction</b>				
Japan Synthetic Rubber Co., Ltd.	45,000	Yokkaichi, Japan	E.P.C.	1960
Tonen Petrochemical Co.	18,700	Kawasaki, Japan	E.P.C.	1962
Japan Synthetic Rubber Co., Ltd.	50,000	Yokkaichi, Japan	E.P.C.	1964
Japan Synthetic Rubber Co., Ltd.	50,000	Chiba, Japan	E.P.C.	1966
Japan Synthetic Rubber Co., Ltd.	80,000	Chiba, Japan	E.P.C.	1969
Japan Synthetic Rubber Co., Ltd.	50,000	Kashima, Japan	E.P.C.	1971
Japan Synthetic Rubber Co., Ltd.	95,000	Yokkaichi, Japan	E.P.C.	1976
Samsung General Chemical Corp. / Lummus	60,000	Daesan, Korea	B.	1989
Hyundai Petrochemical Corp. / M.W. Kellogg Ltd.	60,000	Daesan, Korea	B.	1989
Lucky Petrochemical Corp.	60,000	Yosu, Korea	B.	1989
Cain Chemical Inc.	150,000	Houston, U.S.A.	B.	1989
Japan Synthetic Rubber Co., Ltd.	Ex.120,000	Kashima, Japan	E.P.C.	1992
China National Technical Import and Export Corp. (CNTIC)/ Fushun Petrochemical Complex	17,000	Fushun, China	B.E.P.CS.M.T.	1992
PTT Global Chemical Company Limited	Undisclosed	Map Ta Phut, Thailand	E.P.C.	2013
<b>Styrene Butadiene Rubber (SBR)</b>				
Japan Synthetic Rubber Co., Ltd.	45,000 (as monomer feed)	Yokkaichi, Japan	E.P.C.	1960
Dainippon Ink & Chemicals, Inc.	Latex 1,800	Chiba, Japan	E.P.C.	1967
Dow S/B Latex (Zhangjiagang) Co., Ltd.	Latex 22,000	Zhangjiagang, China	E.P.S.C.	2002

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>MBS Resin</b>				
Kureha Chemicals Singapore (Pte.) Ltd.	16,000	Pulau Merbau, Singapore	E.P.C.	1990
Kureha Chemicals Singapore (Pte.) Ltd.	16,000	Pulau Merbau, Singapore	B.E.P.C.M.	1996
<b>Iso-Butene &amp; Butene-1</b>				
Dainippon Ink & Chemicals, Inc.	Iso-Butene 6,000	Chiba, Japan	E.P.C.	1969
Dainippon Ink & Chemicals, Inc.	Butene-1 7,200	Chiba, Japan	E.P.C.	1969
Idemitsu Petrochemical Co., Ltd.	Butene-1 35,000	Tokuyama, Japan	E.P.C.	1985
Yukong Ltd.	Butene-1 45,000	Ulsan, Korea	B.	1989
China National Technical Import and Export Corp. (CNTIC)/Fushun Petrochemical Complex	Butene-1 10,000	Fushun, China	B.E.P.CS.M.T.	1992
<b>Methyl Tertiary Butyl Ether (MTBE)</b>				
Tetra Chemicals (Singapore) Pte. Ltd.	50,000	Pulau Merbau, Singapore	E.P.C.	1987
Qatar Fuel Additives Co., Ltd. (QAFAC)	610,000	Umm Said, Qatar	E.P.C.M.	1999
<b>Isobutylene-Isoprene Rubber (IIR)</b>				
Japan Butyl Co., Ltd.	30,000	Kawasaki, Japan	E.P.C.	1968
<b>Sec-Butyl Alcohol (SBA)</b>				
Maruzen Oil Co., Ltd.	5,000	Shimozu, Japan	B.E.P.C.	1958
Maruzen Oil Co., Ltd.	13,000	Chiba, Japan	B.E.P.C.	1968
Maruzen Oil Co., Ltd.	Ex. 34,000	Chiba, Japan	B.E.	1978
Idemitsu Petrochemical Co., Ltd.	35,000	Tokuyama, Japan	B.E.P.C.	1985
Idemitsu Petrochemical Co., Ltd.	Ex. 6,000	Tokuyama, Japan	E.	1989
<b>Methyl Ethyl Ketone (MEK)</b>				
Maruzen Oil Co., Ltd.	5,000	Shimozu, Japan	B.E.P.C.	1958
Maruzen Oil Co., Ltd.	13,000	Chiba, Japan	B.E.P.C.	1968
Maruzen Oil Co., Ltd.	Ex. 34,000	Chiba, Japan	B.E.	1978
Idemitsu Engineering Co., Ltd.	30,000	Tokuyama, Japan	B.E.P.C.	1985
Idemitsu Engineering Co., Ltd.	Ex. 6,000	Tokuyama, Japan	E.	1986
<b>Iso-Octene</b>				
Idemitsu Petrochemical Co., Ltd.	11,000	Tokuyama, Japan	E.P.C.	1985
China National Technical Import and Export Corp. (CNTIC)/Fushun Petrochemical Complex	5,000	Fushun, China	B.E.P.CS.M.T.	1992
Seibu Oil Co., Ltd.	22,000	Yamaguchi, Japan	E.P.C.	1993

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Isoprene Extraction</b>				
Nippon Petrochemical Co., Ltd.	4,000	Kawasaki, Japan	B.E.P.C	1970
Kashima Isoprene Co., Ltd.	30,000	Kashima, Japan	B.E.P.C	1972
<b>Polyisoprene (Isoprene Rubber)</b>				
Japan Polyisoprene Co., Ltd.	30,000	Kashima, Japan	E.P.C	1972
<b>C5 Resin</b>				
Tonen Petrochemical Co., Ltd.	6,000	Kawasaki, Japan	E.P.C	1989
Zeon Chemical (Thailand) Co., Ltd.	20,000	Rayong, Thailand	E.P.C	1998

## Aromatics

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Cracked Gasoline Hydrogenation</b>				
Mitsubishi Petrochemical Co., Ltd.	160,000	Kashima, Japan	B.E.P.C.	1970
China National Technical Import Corp. (CNITC)/ China Petrochemical Co. (SINOPEC)	109,400	Shanghai, China	B.E.P.CS.M.	1976
<b>Light Naphtha (Paraffins) To Aromatics</b>				
Mitsubishi Oil Co., Ltd.	Pilot 200 BPSD	Kawasaki, Japan	E.P.C.	1990
Idemitsu Kosan Co., Ltd.	Undisclosable (as benzene)	Chiba, Japan	E.P.C.	1992
Arabian Industrial Fibers Co. (Ibn Rushd)	1,332,000 (as C <sub>3</sub> /C <sub>4</sub> Feed)	Yanbu, Saudi Arabia	E.P.C.	1998
Saudi Chevron Petrochemical Co., Ltd.	2,261,000	Al-Jubail, Saudi Arabia	E.P.C.	1999
<b>BTX Extraction</b>				
Mitsubishi Oil Co., Ltd.	20,000	Kawasaki, Japan	E.P.C.	1958
Petromin Shell Refinery Co.	370,000	Al-Jubail, Saudi Arabia	E.P.C.	1985
Mitsubishi Gas Chemical Co., Inc.	40,000	Mizushima, Japan	E.P.C.	1986
Kyung In Energy Co., Ltd.	260,000	Inchon, Korea	E.P.PS.CS.	1991
Taiyo Oil Co., Ltd.	240,000	Kikuma, Japan	E.P.C.	1991
Showa Yokkaichi Sekiyu Co., Ltd.	250,000	Yokkaichi, Japan	E.P.C.	1992
Idemitsu Kosan Co., Ltd.	Undisclosable	Chiba, Japan	E.P.C.	1992
Fuji Oil Co., Ltd.	180,000	Chiba, Japan	E.P.C.	1993
Taiyo Oil Co., Ltd.	Ex. to 9,100 BPSD	Kikuma, Japan	E.P.C.	1996

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
Adchemco Co.	130,000	Sasaoka, Japan	E.P.C.M.	1994
Seibu Oil Co., Ltd.	150,000	Onoda, Japan	E.P.C.	1998
Showa Yokkaichi Sekiyu Co., Ltd./ Shoseki Engineering & Construction Co., Ltd.	155,000	Yokkaichi, Japan	E.P.C.	1998
Tohoku Oil Co., Ltd./Mitsubishi Oil Engineering Co., Ltd.	—	Sendai, Japan	E.P.C.	1999
Kashima Aromatics Co., Ltd.	190,000	Kashima, Japan	E.P.C.	2007
Toa Oil Co., Ltd.	120,000	Kawasaki, Japan	E.P.C.	2011

#### Benzene (Hydrodealkylation)

Mitsubishi Petrochemical Co., Ltd.	110,000	Yokkaichi, Japan	B.E.P.C.	1967
Toray Industries, Inc.	156,000	Kawasaki, Japan	E.P.C.	1969
Mitsubishi Petrochemical Co., Ltd.	130,000	Kashima, Japan	B.E.P.CS.	1970
Union Rheinische Braunkohlen Kraftstoff A.G.	100,000	Wesseling, W. Germany	B.E.	1975
Empresa Nacional Del Petroleo S.A.	80,000	Ciudadreal, Spain	B.E.	1976
V/O Techmashimport	200,000	Nizhnekamsk, U.S.S.R.	B.E.CS.	1976
V/O Techmashimport	120,000	Krasnodar, U.S.S.R.	B.E.P.CS.	1977
Petromin Shell Refinery Co.	220,000	Al-Jubail, Saudi Arabia	E.P.C.	1985
Nigerian National Petroleum Corp. (NNPC)	15,000	Kaduna, Nigeria	E.P.C.	1987
Nippon Steel Chemical Co., Ltd.	177,000	Ohita, Japan	B.E.P.C.	1990
Nippon Mining Co., Ltd.	100,000	Mizushima, Japan	B.E.P.C.	1990
Taiyo Oil Co., Ltd.	383,000	Kikuma, Japan	B.E.P.C.	1991
Mitsubishi Petrochemical Co., Ltd.	130,000	Kashima, Japan	E.P.C.	1992
Fuji Oil Co., Ltd.	95,000	Chiba, Japan	E.P.C.	1993
Arabian Industrial Fibers Co. (Ibn Rushd)	349,000	Yanbu, Saudi Arabia	E.P.C.	1998
Saudi Chevron Petrochemical Co., Ltd.	480,000	Al-Jubail, Saudi Arabia	E.P.C.	1999

#### Ethylbenzene (EB)

Mitsubishi Petrochemical Co., Ltd.	19,000	Yokkaichi, Japan	E.P.C.	1959
Mitsubishi Petrochemical Co., Ltd.	38,000	Yokkaichi, Japan	E.P.C.	1963
Mitsubishi Petrochemical Co., Ltd.	45,000	Yokkaichi, Japan	E.P.C.	1965
Mitsubishi Petrochemical Co., Ltd.	70,000	Yokkaichi, Japan	E.P.C.	1968
Mitsubishi Petrochemical Co., Ltd.	100,000	Kashima, Japan	E.P.C.	1970
Mitsubishi Petrochemical Co., Ltd.	200,000	Kashima, Japan	E.P.C.	1975
Seraya Chemicals Singapore (Pte.) Ltd .	Unannounced	Pulau Seraya, Singapore	E.P.C.	1997
CNOOC and Shell Petrochemicals Co., Ltd.	Unannounced	Huizhou, China	E.P.C.M.	2005

#### Styrene Monomer (SM)

Mitsubishi Petrochemical Co., Ltd.	15,000	Yokkaichi, Japan	E.P.C.	1959
Mitsubishi Petrochemical Co., Ltd.	30,000	Yokkaichi, Japan	E.P.C.	1963
Mitsubishi Petrochemical Co., Ltd.	36,000	Yokkaichi, Japan	E.P.C.	1965
Mitsubishi Petrochemical Co., Ltd.	54,000	Yokkaichi, Japan	E.P.C.	1968
Mitsubishi Petrochemical Co., Ltd.	80,000	Kashima, Japan	E.P.C.	1970
Mitsubishi Petrochemical Co., Ltd.	160,000	Kashima, Japan	E.P.C.	1975
Mitsubishi Petrochemical Co., Ltd.	Ex. 54,000	Yokkaichi, Japan	E.P.C.	1980
Mitsubishi Petrochemical Co., Ltd.	Ex. 96,000	Yokkaichi, Japan	E.P.C.	1982

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Polystyrene</b>				
Kokan Kagaku K.K.	GPS/HPS/EPS 9,000	Kawasaki, Japan	E.P.C.	1960
Kokan Kagaku K.K.	GPS/HPS/EPS 9,000	Kawasaki, Japan	E.P.C.	1963
Arabian Petrochemical Co. (PETROKEMYA)	EPS 30,000	Al-Jubail, Saudi Arabia	E.P.C.	1987
Arabian Petrochemical Co. (PETROKEMYA)	GPS 20,000	Al-Jubail, Saudi Arabia	E.P.C.	1987
Arabian Petrochemical Co. (PETROKEMYA)	HPS 50,000	Al-Jubail, Saudi Arabia	E.P.C.	1987
Denki Kagaku Kogyo Co., Ltd.	GPS 30,000	Chiba, Japan	B.E.P.C.	1988
Denki Kagaku Kogyo Co., Ltd.	GPS 40,000	Chiba, Japan	B.E.P.C.	1990
HMT Polystyrene Co., Ltd.	GPS 60,000	Rayong, Thailand	E.P.C.	1998
SAL Petrochemical (Zhangjiagang) Co., Ltd.	GPS/HPS 120,000	Zhangjiagang, China	E.P.S.C.	2002
<b>Styrene-Acrylonitrile Copolymer (AS)</b>				
Cheil Industries Incorporated	30,000	Yocheon, Korea	B.	1990
DSM-Kunststoffen B.V.	20,000	Geleen, Netherland	B.	1990
<b>Styrene Monomer and Propylene Oxide (SM/PO)</b>				
Seraya Chemicals Singapore (Pte.) Ltd.	SM 315,000 PO 140,000	Pulau Seraya, Singapore	E.P.C.	1997
CNOOC and Shell Petrochemicals Co., Ltd.	SM 560,000 PO 250,000	Huizhou, China	E.P.C.M.	2005
<b>Cyclohexane</b>				
Mitsubishi Petrochemical Co., Ltd.	30,000	Yokkaichi, Japan	E.P.C.	1968
Nitrocarbano S.A.	37,000	Camacari, Brazil	E.P.CS.	1978
The Fertilisers and Chemicals Travancore Ltd.	52,000	Cochin, India	E.P.CS.	1989
Saudi Chevron Petrochemical Co., Ltd.	220,000	Al-Jubail, Saudi Arabia	E.P.C.	1999
<b>Caprolactam</b>				
Ube Industries. Ltd.	Cyclohexane Oxime 70,000	Sakai, Japan	E.P.C.	1972
Hankook Caprolactam Corp.	33,000	Ulsan, Korea	E.P.CS.	1974
Nitrocarbano S.A.	35,000	Camacari, Brazil	E.P.CS.	1978
Hankook Caprolactam Corp.	Ex. 33,000	Ulsan, Korea	E.PS.	1988
The Fertilisers and Chemicals Travancore Ltd .	50,000	Udyogamandar, India	E.P.CS.	1989
China Petrochemical International (SINOPEC-INTER)/ Yueyang Petrochemical Complex	50,000	Yueyang, China	E.P.CS.M.T.	1992
China Petrochemical Development Corp.	120,000	Kaohsiung, Taiwan	E.P.CS.	2000
<b>Bisphenol-A (BPA)</b>				
Nippon Steel Chemical Co., Ltd.	70,000	Tobata, Japan	B.E.P.C.	1991
Taiwan Prosperity Chemical Corp.	25,000	Kaohsiung, Taiwan	B.E.P.C.	1995
Mitsubishi Chemical Corp.	70,000	Kashima, Japan	B.E.P.C.	1997

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
Nippon Steel Chemical Co., Ltd.	Ex. 25,000	Tobata, Japan	B.E.	1999
Mitsubishi Chemical Corp.	Ex. 30,000	Kashima, Japan	B.E.P.C.	2000
Mitsubishi Chemical Corp.	100,000	Kurosaki, Japan	B.E.P.C.	2002
China National Blue Star (Group) Corp./ Wuxi Resin Plant of Xingchen Chemical Engineering New Materials Co., Ltd.	25,000	Wuxi, China	B.E.P.CS.M.T.	2003
Huizhou Haicheng Chemical Co., Ltd.	25,000	Huizhou, China	B.E.P.CS.M.T.	2006

#### Epoxy Resins

Dainippon Ink & Chemicals, Inc.	6,000	Chiba, Japan	B.E.P.C.	1970
Asahi Denka Kogyo K.K.	6,000	Chiba, Japan	B.E.P.C.	1985
Dow Chemicals Co., Ltd.	20,000	Kinuura, Japan	E.P.C.	1988
The Dow Chemical (Zhangjiagang) Co., Ltd.	41,000	Zhangjiagang, China	E.PS.CS.C.	2003

#### Alkyl Phenol

Dainippon Ink & Chemicals, Inc.	1,200	Chiba, Japan	B.E.P.C.	1966
Dainippon Ink & Chemicals, Inc.	2,400	Chiba, Japan	B.E.P.C.	1969
Dainippon Ink & Chemicals, Inc.	4,800	Chiba, Japan	B.E.P.C.	1972
Dainippon Ink & Chemicals, Inc.	20,000	Chiba, Japan	B.E.P.C.	1982
Dainippon Ink & Chemicals, Inc.	7,000	Chiba, Japan	B.E.P.C.	1990

#### Maleic Anhydride

Yahata Maleic Acid Industries, Ltd.	—	Tobata, Japan	B.E.P.C.	1956
Takeda Chemical Industries, Ltd.	16,000	Yamaguchi, Japan	B.E.P.C.	1959
Takeda Chemical Industries, Ltd.	32,000	Yamaguchi, Japan	B.E.P.C.	1961

#### Tetrahydrofuran (THF)

Nippon Hydrofuran Co., Ltd.	4,000	Mizushima, Japan	B.E.P.C.	1971
Imperial Chemical Industries, Ltd. (ICI)	3,000	Sevenston, England	B.E.	1972

#### $\gamma$ -Butyrolactone (GBL)

Nippon Hydrofuran Co., Ltd.	1,000	Mizushima, Japan	B.E.P.C.	1971
Imperial Chemical Industries, Ltd. (ICI)	2,000	Sevenston, England	B.E.	1972

#### Linear Alkyl Benzene (LAB)

Mitsubishi Petrochemical Co., Ltd.	Ex. 25,000	Yokkaichi, Japan	E.P.C.	1970
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#### Synthetic Detergent

Lion Fat & Oil Co., Ltd.	40,000	Kokura, Japan	E.P.C.	1961
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Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
Lion Fat & Oil Co., Ltd.	60,000	Kawasaki, Japan	E.P.C.	1965
Lion Fat & Oil Co., Ltd.	60,000	Sakai, Japan	E.P.C.	1967
Lion Fat & Oil Co., Ltd.	60,000	Kawasaki, Japan	E.P.C.	1969
Lion Fat & Oil Co., Ltd.	Ex. 60,000	Sakai, Japan	E.P.C.	1972
Lion Corp.	60,000	Chiba, Japan	E.P.C.	1982

#### Methylene Dianiline/Diphenylmethane Diisocyanate (MDA/MDI)

Undisclosable	MDA/MDI	Unannounced	Undisclosable	F.	2001
Sumika Bayer Urethane Co., Ltd.	MDA/MDI	Ex. 20,000	Niihama, Japan	E.P.C.	2002

#### Toluene Diamine/Toluene Diisocyanate (TDA/TDI)

Undisclosable	TDA/TDI	Unannounced	Undisclosable	F.	2001
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#### Phenol

Nippon Steel Chemical Co., Ltd.	120,000	Tobata, Japan	B.E.P.C.	1991
Undisclosable	27,000	Undisclosable	F.	1999

#### Benzoate Group

Undisclosable	Benzoic Acid	4,500	Undisclosable	F.	1999
Undisclosable	Sodium Benzoate	4,500	Undisclosable	F.	1999
Undisclosable	Benzoaldehyde	5,400	Undisclosable	F.	1999

#### Xylene Disproportionation

Kyung In Energy Co., Ltd.	350,000 (as Feed)	Inchon, Korea	E.P.PS.CS.	1991
Arabian Industrial Fibers Co. (Ibn Rushd)	220,000 (as Xylene)	Yanbu, Saudi Arabia	E.P.C.	1998
Kashima Aromatics Co., Ltd.	15,000 BPSD	Kashima, Japan	E.P.C.	2007
Taiyo Oil Co., Ltd.	10,000 BPSD	Kikuma, Japan	E.P.C.	2014

#### Ethylbenzene Separation

Mitsubishi Gas Chemical Co., Ltd.	55,000	Mizushima, Japan	B.E.P.C.	1972
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#### Xylene Isomerization

Mitsubishi Gas Chemical Co., Inc.	100,000	Mizushima, Japan	B.E.P.C.	1968
Anic S.P.A.	200,000	Italy	B.E.	1971
Mitsubishi Gas Chemical Co., Inc.	150,000	Mizushima, Japan	B.E.P.C.	1972
Amoco Chemicals Corp.	200,000	U.S.A.	B.E.	1973
Mitsubishi Gas Chemical Co., Inc.	Ex. 100,000	Mizushima, Japan	B.E.P.C.	1978

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
Mitsubishi Oil Co., Ltd.	130,000 (as P-Xylene)	Mizushima, Japan	E.P.C.	1988
Mitsubishi Oil Co., Ltd.	150,000 (as P-Xylene)	Mizushima, Japan	E.P.C.	1990
Kashima Oil Co., Ltd.	100,000 (as P-Xylene)	Kashima, Japan	E.P.C.	1991
Ohita Paraxylene Co., Ltd.	300,000 (as P-Xylene)	Ohita, Japan	E.P.C.M.	1997
Arabian Industrial Fibers Co. (Ibn Rushd)	375,000 (as P-Xylene)	Yanbu, Saudi Arabia	E.P.C.	1998
Kashima Aromatics Co., Ltd.	420,000 (as P-Xylene)	Kashima, Japan	E.P.C.	2007

#### Para-Xylene Separation

Mitsubishi Gas Chemical Co., Inc.	30,000	Mizushima, Japan	B.E.P.C.	1968
Toray Industries, Inc.	73,000	Kawasaki, Japan	E.P.C.	1969
Anic S.P.A.	78,000	Italy	B.E.	1971
Mitsubishi Gas Chemical Co., Inc.	50,000	Mizushima, Japan	B.E.P.C.	1972
Toray Industries, Inc.	110,000	Kawasaki, Japan	B.E.P.C.	1973
China National Technical Import Corp. (CNTIC)	17,200	Shanghai, China	E.P.CS.M.	1976
Mitsubishi Gas Chemical Co., Inc.	Ex. 31,000	Mizushima, Japan	B.E.P.C.	1978
Mitsubishi Oil Co., Ltd.	130,000	Mizushima, Japan	E.P.C.	1987
Mitsubishi Oil Co., Ltd.	150,000	Mizushima, Japan	E.P.C.	1990
Kashima Oil Co., Ltd.	100,000	Kashima, Japan	E.P.C.	1991
Ohita Paraxylene Co., Ltd.	300,000	Ohita, Japan	E.P.C.M.	1997
Arabian Industrial Fibers Co. (Ibn Rushd)	375,000	Yanbu, Saudi Arabia	E.P.C.	1998
Ohita Paraxylene Co., Ltd.	Re 420,000 (from 300,000)	Ohita, Japan	E.P.C.	2005

#### Meta-Xylene Separation

Mitsubishi Gas Chemical Co., Inc.	70,000	Mizushima, Japan	E.P.C.	2009
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#### Terephthalic Acid

Kawasaki Chemicals, Ltd.	CTA	—	Kawasaki, Japan	E.P.C.	1965
Mizushima Aroma Co., Ltd.	PTA	36,000	Mizushima, Japan	B.E.P.C.	1972
Mizushima Aroma Co., Ltd.	CTA	56,000	Mizushima, Japan	B.E.P.C.	1972
Mizushima Aroma Co., Ltd.	CTA	70,000	Mizushima, Japan	B.E.P.C.	1977
China American Petrochemical Co., Ltd. (CAPCO)	PTA	150,000	Lin-Yuan, Taiwan	E.P.C.	1979
China American Petrochemical Co., Ltd. (CAPCO)	CTA	155,000	Lin-Yuan, Taiwan	E.P.C.	1979
China American Petrochemical Co., Ltd. (CAPCO)	PTA	150,000	Lin-Yuan, Taiwan	E.P.C.	1982
China American Petrochemical Co., Ltd. (CAPCO)	CTA	155,000	Lin-Yuan, Taiwan	E.P.C.	1982
Samsung Petrochemical Co., Ltd.	PTA	200,000	Ulsan, Korea	E.PS.	1987
Samsung Petrochemical Co., Ltd.	CTA	200,000	Ulsan, Korea	E.PS.	1987
China American Petrochemical Co., Ltd. (CAPCO)	PTA	225,000	Lin-Yuan, Taiwan	E.P.C.	1989
China American Petrochemical Co., Ltd. (CAPCO)	CTA	230,000	Lin-Yuan, Taiwan	E.P.C.	1989
China American Petrochemical Co., Ltd. (CAPCO)	PTA	225,000	Lin-Yuan, Taiwan	E.P.C.	1990
China American Petrochemical Co., Ltd. (CAPCO)	CTA	230,000	Lin-Yuan, Taiwan	E.P.C.	1990
Samsung Petrochemical Co., Ltd.	PTA	250,000	Ulsan, Korea	B.E.P.C.CS.M.	1995
Samsung Petrochemical Co., Ltd.	CTA	250,000	Ulsan, Korea	B.E.P.C.CS.M.	1995
China American Petrochemical Co., Ltd. (CAPCO)	PTA	350,000	Lin-Yuan, Taiwan	E.P.C.	1995
China American Petrochemical Co., Ltd. (CAPCO)	CTA	350,000	Lin-Yuan, Taiwan	E.P.C.	1995

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
PT. Amoco Mitsui PTA Indonesia	PTA 350,000	Merak, Indonesia	E.P.C.	1997
PT. Amoco Mitsui PTA Indonesia	CTA 350,000	Merak, Indonesia	E.P.C.	1997
Mizushima Aroma Co., Ltd.	PTA 250,000	Mizushima, Japan	B.E.P.C.	1997
Mizushima Aroma Co., Ltd.	CTA Ex.100,000	Mizushima, Japan	B.E.P.C.	1997
Amoco-Zhuhai Chemical Co., Ltd.	PTA 250,000	Zhuhai, China	B.E.P.C.	1997
Amoco-Zhuhai Chemical Co., Ltd.	CTA 250,000	Zhuhai, China	B.E.P.C.	1997
SINOPEC-INTER / Luoyang Petrochemical Complex	PTA 225,000	Luoyang, China	B.E.P.CS.M.T.	2000
SINOPEC-INTER / Luoyang Petrochemical Complex	CTA 225,000	Luoyang, China	B.E.P.CS.M.T.	2000

CTA: Crude Telephthalic Acid

PTA: Pure Telephthalic Acid

#### Dimethyl Terephthalate (DMT)

Mitsubishi Chemical Industries, Ltd.	6,000	Kurosaki, Japan	E.P.C.	1964
Kawasaki Chemicals, Ltd.	5,400	Kawasaki, Japan	B.E.P.C.	1965

#### Ortho-Xylene Separation

Mitsubishi Gas Chemical Co., Inc.	32,000	Mizushima, Japan	B.E.P.C.	1968
Anic S.P.A.	79,000	Italy	B.E.	1971
Mitsubishi Gas Chemical Co., Inc.	28,000	Mizushima, Japan	B.E.P.C.	1972
Mitsubishi Gas Chemical Co., Inc.	Ex. 10,000	Mizushima, Japan	B.E.P.C.	1978
Arabian Industrial Fibers Co. (Ibn Rushd)	45,000	Yanbu, Saudi Arabia	E.P.C.	1998

#### Phthalic Anhydride

Kawasaki Chemicals, Ltd.	16,000	Kawasaki, Japan	E.P.C.	1968
Kawasaki Chemicals, Ltd.	13,000	Kawasaki, Japan	E.P.C.	1969
Kawasaki Chemicals, Ltd.	29,000	Kawasaki, Japan	E.P.C.	1971

#### Meta-Xylene

Mitsubishi Gas Chemical Co., Inc.	20,000	Mizushima, Japan	B.E.P.C.	1968
Anic S.P.A.	42,000	Italy	B.E.	1971
Mitsubishi Gas Chemical Co., Inc.	30,000	Mizushima, Japan	B.E.P.C.	1972
Amoco Chemicals Corp.	80,000	U.S.A.	B.E.	1973
Mitsubishi Gas Chemical Co., Inc.	Ex. 30,000	Mizushima, Japan	B.E.P.C.	1978

#### Mix-Xylene Separation Process

Nippon Petroleum Refining Co., Ltd.	297,000	Negishi, Japan	B.E.P.C.	1986
Nippon Mining Co., Ltd.	177,000	Mizushima, Japan	B.E.P.C.	1990
Taiyo Oil Co., Ltd.	392,000	Kikuma, Japan	B.E.P.C.	1991
Fuji Oil Co., Ltd.	245,000	Sodegaura, Japan	B.E.P.C.	1993
Nippon Petroleum Refining Co., Ltd.	Re 20,000 BPSD (from 17,000 BPSD)	Muroran, Japan	B.E.P.C.	2005
Seibu Oil Co., Ltd.	200,000	Yamaguchi, Japan	B.E.P.C.	2006
TonenGeneral Sekiyu K.K.	230,000	Chiba, Japan	B.E.P.C.	2016

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Isophthalic Acid</b>				
A.G. International Chemical Co., Inc.	10,000	Mizushima, Japan	E.P.C.	1968
A.G. International Chemical Co., Inc.	25,000	Mizushima, Japan	E.P.C.	1971
<b>Meta-Xylylenediamine (MXDA)</b>				
Mitsubishi Gas Chemical Co., Inc.	4,000	Niigata, Japan	B.E.P.C.	1981
Mitsubishi Gas Chemical Co., Inc.	15,000	Niigata, Japan	B.E.P.C.	1992
Mitsubishi Gas Chemical Co., Inc.	—	Niigata, Japan	B.E.P.C.	2000
Mitsubishi Gas Chemical Co., Inc.	—	Niigata, Japan	B.E.P.C.	2001
Mitsubishi Gas Chemical Co., Inc.	—	Niigata, Japan	B.E.P.C.	2002
Mitsubishi Gas Chemical Co., Inc.	20,000	Mizushima, Japan	B.E.P.C.	2007
<b>Dimethyl-Benzaldehyde (DBAL)</b>				
Mitsubishi Gas Chemical Co., Inc.	8,000	Mizushima, Japan	B.E.P.C.	1985
<b>Trimethyl Benzene</b>				
Kuraray Yuka Co., Ltd.	Pseudocumene 1,500	Yokkaichi, Japan	E.P.C.	1970
Mitsubishi Gas Chemical Co., Inc.	Mesitylene 15,000	Mizushima, Japan	B.E.P.C.	1971
<b>2,6 Diisopropylnahthalane (2.6DIPN)</b>				
Nippon Kokan K.K.	1,000	Kasaoka, Japan	B.E.P.C.	1991

## Paraffin/Methane/Acetylene Derivatives/Oleo Chemicals

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Normal Paraffin (Kerosene-LGO)</b>				
Nippon Mining Co., Ltd.	40,000	Mizushima, Japan	B.E.P.C.	1967
Nippon Mining Co., Ltd.	66,000	Mizushima, Japan	E.P.C.	1979
<b>Higher Alcohol</b>				
Mitsubishi Petrochemical Co., Ltd.	20,000	Kashima, Japan	E.P.C.	1975

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Fatty Nirile/Amines</b>				
Lion Akzo K.K.	Fatty Amines 12,000	Yokkaichi, Japan	B.E.P.C.	1987
Lion Akzo K.K.	Fatty Nitrile 12,000	Yokkaichi, Japan	B.E.P.C.	1987
<b>Methyl Ester</b>				
Lion Corp.	Coconut Oil Methyl Ester 30,000	Sakaide, Japan	E.P.C.	1990
Lion Corp.	Palm Oil Methyl Ester 40,000	Sakaide, Japan	E.P.C.	1990
<b>Carotene</b>				
Lion Corp.	40	Sakaide, Japan	E.P.C.	1990
<b>Chloro-Methanes</b>				
Kureha Chemical Industry Co., Ltd.	CCl <sub>4</sub>	Nishiki, Japan	E.P.C.	1963
Asahi Glass Co.	CHCl <sub>3</sub> 960	Chiba, Japan	E.P.C.	1965
	CH <sub>3</sub> Cl 960			
	CH <sub>2</sub> Cl <sub>2</sub> 1,320			
	CCl <sub>4</sub> 7,200			
<b>Acetylene</b>				
Kureha Chemical Industry Co., Ltd.	6,000 (as Acetylene)	Nishiki, Japan	B.E.P.C.	1963
Kureha Chemical Industry Co., Ltd.	24,000 (as Acetylene)	Nishiki, Japan	B.E.P.C.	1970
<b>Chloroprene</b>				
Denki Kagaku Kogyo K.K.	5,000	Niigata, Japan	B.E.P.C.	1962
Denki Kagaku Kogyo K.K.	8,000	Niigata, Japan	B.E.P.C.	1964
Denki Kagaku Kogyo K.K.	8,000	Niigata, Japan	B.E.P.C.	1966
Denki Kagaku Kogyo K.K.	8,000	Niigata, Japan	B.E.P.C.	1968
Denki Kagaku Kogyo K.K.	12,000	Niigata, Japan	B.E.P.C.	1970
<b>Chloroprene Rubber</b>				
Denki Kagaku Kogyo K.K.	5,000	Niigata, Japan	B.E.P.C.	1962
Denki Kagaku Kogyo K.K.	8,000	Niigata, Japan	B.E.P.C.	1964
Denki Kagaku Kogyo K.K.	8,000	Niigata, Japan	B.E.P.C.	1966
Denki Kagaku Kogyo K.K.	8,000	Niigata, Japan	B.E.P.C.	1968
Denki Kagaku Kogyo K.K.	10,000	Niigata, Japan	B.E.P.C.	1970

# Engineering Plastics

Client	Capacity (Tons/Year)		Location	Scope of Work	Year of Completion
<b>Polyamide</b>					
Kurehabo Co., Ltd.	Nylon 6	10 T/D	Tsuruga, Japan	E.P.C.	1964
Asahi Chemical Industry Co., Ltd.	Nylon 6	10 T/D	Nobeoka, Japan	E.P.C.	1964
Toyobo Co., Ltd.	Nylon 6	15 T/D	Tsuruga, Japan	E.P.C.	1966
Toyobo Co., Ltd.	Nylon 6	– T/D	Tsuruga, Japan	E.P.C.	1968
Toyobo Co., Ltd.	Nylon 6	15 T/D	Tsuruga, Japan	E.P.C.	1969
<b>Polycarbonate</b>					
Teijin Polycarbonate Singapore Pte. Ltd.		60,000	Jurong, Singapore	E.P.C.	1999
Teijin Polycarbonate Singapore Pte. Ltd.		Ex. 20,000	Jurong, Singapore	E.P.C.	2000
Teijin Polycarbonate Singapore Pte. Ltd.		50,000	Jurong, Singapore	E.P.C.	2001
Teijin Polycarbonate Singapore Pte. Ltd.		50,000	Jurong, Singapore	E.P.C.	2002
Teijin Polycarbonate Singapore Pte. Ltd.		Ex. 20,000	Jurong, Singapore	E.P.C.	2004
<b>Polyethylene Terephthalate (PET)</b>					
Teijin Indonesia Fiber Co.		—	Tangenang, Indonesia	E.P.C.	1998
<b>Fluoro Carbon Resin</b>					
Daikin America Inc.	PTFE,HFP	—	Alabama, U.S.A.	E.P.C.	1993
Daikin America Inc.	FEP	—	Alabama, U.S.A.	E.P.C.	1995
Kureha Chemical Industry Co., Ltd.	PVDF	5,000	Nishiki, Japan	E.P.C.	1996
<b>Polyphenylene Sulfide (PPS)</b>					
Kureha Chemical Industry Co., Ltd.		3,600	Nishiki, Japan	B.E.P.C.	1987
Kureha Chemical Industry Co., Ltd.		Ex. 1,800	Nishiki, Japan	E.P.C.	2000
<b>Syndiotactic Polystyrene (SPS)</b>					
Idemitsu Petrochemical Co., Ltd.		5,000	Chiba, Japan	B.E.P.C.	1996
<b>Ethylene Vinyl Alcohol Copolymer (EVAC)</b>					
Noltex L.L.C.	EVOH	10,000	Texas, U.S.A.	E.P.C.	1995
Noltex L.L.C.	EVOH	10,000	Texas, U.S.A.	E.P.C.	1998

# Synthesis Gas/Fertilizers

(for Hydrogen Manufacturing Units please see page 30~31)

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
<b>Ammonia</b>				
Tohoku Hiryo K.K.	130	Akita, Japan	B.E.P.C.M. (Reforming Section)	1963
Kyowa Chemicals Co., Ltd.	260	Ube, Japan	B.E.P.C.M. (Synthesis Gas Generation Section)	1965
Delhi Cloth & General Mills Co., Ltd. (Current:Shriram Fertilizer & Chemicals)	450	Kota, India	B.E.P.C.M.T.	1969
Mitsubishi Chemical Industries, Ltd.	1,000	Kurosaki, Japan	B.E.P.C.M.T. (Reforming Section)	1970
Nippon Kasei Chemical Co., Ltd.	1,000	Onahama, Japan	B.E.P.C.M.T. (Reforming Section)	1970
Delhi Cloth & General Mills Co., Ltd. (Current:Shriram Fertilizer & Chemicals)	Ex.to 600	Kota, India	B.E.P.CS.M.	1974
Mitsubishi Gas Chemical Co., Inc.	800	Niigata, Japan	B.E.P.C.M.T. (Reforming Section)	1977
Ruwais Fertilizer Industries	1,000	Abu Dhabi, U.A.E.	B.E.P.C.M.T.	1983
PT. Pupuk Kalimantan Timur (KALTIM)-Kaltim- 3	1,000	Bontang, Indonesia	B.E.P.C.M.T.	1989
Saudi Arabian Fertilizer Co. (SAFCO)	1,500	Al-Jubail, Saudi Arabia	B.E.P.C.M.T.	1992
Karnaphuli Fertilizer Co., Ltd. (KAFCO)	1,500	Chittagong, Bangladesh	B.E.P.C.M.T.	1995
PT. Pupuk Kalimantan Timur (KALTIM)-Kaltim- 1	Ex.to 1,800	Bontang, Indonesia	B.E.M.	1995
Fudao Chemical Industrial Corp.	1,000	Hainan Is., China	B.E.P.CS.M.T.	1996
NEDO/Myanmar Petrochemical Enterprise	Energy Conservation	Kyaw Zwa, Myanmar	E.P. + S.V.	2003
<b>Urea</b>				
Delhi Cloth & General Mills Co., Ltd. (Current:Shriram Fertilizer & Chemicals)	700	Kota, India	B.E.P.C.M.T.	1969
Petrochemical Industries Corp.	700 x 2	Shuaiba, Kuwait	B.E.P.C.M.	1970
Mitsubishi Chemical Industries, Ltd.	800	Kurosaki, Japan	B.E.P.C.M.T.	1970
Kashima Ammonia Co., Ltd.	1,400	Kashima, Japan	B.E.P.C.M.T.	1970
Mitsubishi Gas Chemical Co., Inc.	600	Niigata, Japan	B.E.P.C.M.T.	1974
Delhi Cloth & General Mills Co., Ltd. (Current:Shriram Fertilizer & Chemicals)	Ex.to 1,000	Kota, India	B.E.P.CS.M.	1974
Qatar Fertiliser Co., Ltd.	1,000	Umm Said, Qatar	B.E.P.C.M.	1979
Ruwais Fertilizer Industries	1,500	Abu Dhabi, U.A.E.	B.E.P.C.M.T.	1983
Saudi Arabian Fertilizer Co. (SAFCO)	90	Damman, Saudi Arabia	B.E.P.C.M.T.	1985
PT. Pupuk Kalimantan Timur (KALTIM)-Kaltim- 3	1,725	Bontang, Indonesia	B.E.P.C.M.T.	1989
Saudi Arabian Fertilizer Co. (SAFCO)	1,800	Al-Jubail, Saudi Arabia	B.E.P.C.M.T.	1992
Karnaphuli Fertilizer Co., Ltd. (KAFCO)	1,750	Chittagong, Bangladesh	E.P.C.M.T.	1995
PT. Pupuk Kalimantan Timur (KALTIM)-Kaltim- 1	Ex.to 2,125	Bontang, Indonesia	B.E.M.	1995
PT. Pupuk Kalimantan Timur (KALTIM)-POPK A	1,725	Bontang, Indonesia	B.E.P.CS.M.T.	1998
Saudi Arabian Fertilizer Co. (SAFCO)	Ex.to 2,150	Al-Jubail, Saudi Arabia	B.	2001
NEDO/Myanma Petrochemical Enterprise	Energy Conservation	Kyaw Zwa, Myanmar	E.P.CS.	2003
Petrochemical Industries Development Management Co. (PIDMCO)	3,250	Bandar Assaluyeh, Iran	B.E.P.M.T.	2005
Petrochemical Industries Development Management Co. (PIDMCO)	3,250	Bandar Assaluyeh, Iran	B.E.P.M.T.	2011
<b>Melamine</b>				
Saudi Arabia Fertilizer Co. (SAFCO)	60	Damman, Saudi Arabia	B.E.P.C.M.T.	1985

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
<b>Melamine</b>				
Saudi Arabia Fertilizer Co. (SAFCO)	60	Damman, Saudi Arabia	B.E.P.C.M.T.	1985
<b>Nitric Acid</b>				
Ube Industries, Ltd.	218	Sakai, Japan	E.C.	1972
Hankook Caprolactam Corp.	97	Ulsan, Korea	E.P.CS.	1974
Nitro Carbono S.A.	109	Camacari, Brazil	E.P.CS.	1978
Hankook Caprolactam Corp.	97	Ulsan, Korea	E.P.CS.	1988
The Fertilizers and Chemicals Travancore, Ltd.	152	Cochin, India	E.P.CS.	1988
China Petrochemical International (SINOPEC-INTER)/ Yueyang Petrochemical Complex	141	Yueyang, China	E.P.CS.M.T.	1992
China Petrochemical Development Corp.	340	Kaohsiung, Taiwan	E.P.CS.	2000
<b>Ammonium Sulfate</b>				
Hankook Caprolactam Corp.	450	Ulsan, Korea	E.P.CS.	1974
Nitro Carbono S.A.	190	Camacari, Brazil	E.P.CS.	1978
Hankook Caprolactam Corp.	682	Ulsan, Korea	E.P.CS.	1988
The Fertilisers and Chemicals Travancore, Ltd.	682	Cochin, India	E.P.CS.	1989
<b>Compound Fertilizer</b>				
Nippon Jordan Fertilizer Co.	NPK 900	Aqaba, Jordan	E.P.C.M.T.	1997
<b>Methanol</b>				
Sabah Gas Chemical Industries	Utility Only 2,000	Sabah, Malaysia	E.P.CS.	1984
Qatar Fuel Additives Co., Ltd. (QAFAC)	2,500	Umm Said, Qatar	E.P.C.M.	1999
International Methanol Co. (IMC)	2,900	Al-Jubail, Saudi Arabia	E.P.C.M.T.	2005
<b>Formalin</b>				
Toho Rika Kogyo K.K.	80,000 T/Y	Nagoya, Japan	E.P.C.M.	1972
Nippon Kasei Chemical Co., Ltd.	36,000 T/Y	Onahama, Japan	E.P.C.M.	1973
<b>Methyl Amine</b>				
Nitto Chemical Co.	4,000 T/Y	Yokohama, Japan	E.P.C.	1954
Mitsubishi Gas Chemical Co., Inc.	1,200 T/Y	Niigata, Japan	E.P.C.M.	1966
Mitsubishi Gas Chemical Co., Inc.	9,600 T/Y	Niigata, Japan	E.P.C.M.	1969
Celanese Mexicana S.A.	8,000 T/Y	La Cangrejera, Mexico	E.P.	1980



Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Dimethylformamide (DMF)</b>				
Mitsubishi Gas Chemical Co., Inc.	1,000 T/Y	Niigata, Japan	E.P.C.M.	1967
Mitsubishi Gas Chemical Co., Inc.	8,000 T/Y	Niigata, Japan	E.P.C.M.	1971
Imperial Chemical Industries Ltd. (ICI)	15,000 T/Y	England	B.E.	1975
Celanese Mexicana S.A.	6,900 T/Y	La Cangrejera, Mexico	E.P.	1980

#### DME

JFE Holdings, Inc.	—	—	FEED	2003
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#### CO/Oxo Gas

Toa Nenryo Kohgyo Co., Ltd.	H <sub>2</sub> +CO 26,800 Nm <sup>3</sup> /h	Kawasaki, Japan	B.E.P.C.	1971
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#### Phosgene

Nippon Soda Co., Ltd.	3,360	Takaoka, Japan	B.E.P.C.	1962
Teijin Polycarbonate Singapore Pte. Ltd.	2 Trains —	Jurong, Singapore	E.P.C.	1999
Teijin Polycarbonate Singapore Pte. Ltd.	—	Jurong, Singapore	E.P.C.	2001
Teijin Polycarbonate Singapore Pte. Ltd.	—	Jurong, Singapore	E.P.C.	2002

## Coal Chemicals

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
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#### Coal Tar Distillation

Fuji Steel Co., Ltd.	200	Muroran, Japan	B.E.P.C.	1956
Nippon Kokan K.K.	200	Kawasaki, Japan	B.E.P.C.	1960
The Minas Gerais Steel Co.	150	Minas Gerais, Brazil	B.E.P.S.	1962
Sumikin Chemical Co., Ltd.	606	Kashima, Japan	B.E.P.C.	1985
Adchemco Corp.	768	Kasaoka, Japan	B.E.P.C.	1988

#### Tar Acid Extraction

Fuji Steel Co., Ltd.	—	Muroran, Japan	B.E.P.C.	1956
Nippon Kokan K.K.	—	Kawasaki, Japan	B.E.P.C.	1960
Adchemco Corp.	19	Kasaoka, Japan	B.E.P.C.	1988

#### Naphtalene Distillation

Fuji Steel Co., Ltd.	28	Muroran, Japan	B.E.P.C.	1956
Nippon Kokan K.K.	29	Kawasaki, Japan	B.E.P.C.	1960
Sumikin Chemical Co., Ltd.	93	Kashima, Japan	B.E.P.C.	1985
Adchemco Corp.	143	Kasaoka, Japan	B.E.P.C.	1988

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
<b>Tar Acid Distillation</b>				
Mitsubishi Chemical Co., Ltd.	—	Kurosaki, Japan	B.E.P.C.	1957
Adchemco Corp.	16	Kasaoka, Japan	B.E.P.C.	1988
<b>COG Purification</b>				
Nippon Kokan K.K.	23,000 Nm <sup>3</sup> /H	Kawasaki, Japan	B.E.P.C.	1961
Yahata Steel Co., Ltd.	26,000 Nm <sup>3</sup> /H	Tobata, Japan	B.E.P.C.	1962
<b>COG Light Oil Recovery</b>				
Nippon Kokan K.K.	48	Kawasaki, Japan	B.E.P.C.	1953
Fuji Steel Co, Ltd.	50	Muroran, Japan	B.E.P.C.	1955
Yahata Chemical Co., Ltd.	45	Tobata, Japan	B.E.P.C.	1959
Nippon Kokan K.K.	90	Kawasaki, Japan	B.E.P.C.	1959
Yahata Chemical Co., Ltd.	45	Tobata, Japan	B.E.P.C.	1960
Sumitomo Metal Industries, Ltd.	60	Wakayama, Japan	B.E.P.C.	1961
The Minas Gerais Steel Co.	60	Minas Gerais, Brazil	B.E.P.S.	1962
Sumitomo Metal Industries, Ltd.	140	Kashima, Japan	B.E.P.C.	1970
Sumitomo Metal Industries, Ltd.	220	Kashima, Japan	B.E.P.C.	1972
<b>Benzoil Distillation</b>				
Nippon Kokan K.K.	48	Kawasaki, Japan	B.E.P.C.	1953
Osaka Gas Co., Ltd.	65	Osaka, Japan	B.E.P.C.	1960
<b>Coal Liquefaction</b>				
Nippon Coal Oil	Pilot 150	Kashima, Japan	B.E.P.C.	1996

## Inorganic Chemicals

Client	Capacity	Location	Scope of Work	Year of Completion
<b>Caustic Soda</b>				
Kanegafuchi Chemical Industry Co., Ltd.	10,000 T/M	Takasago, Japan	E.P.C.M.	1974
Central Chemical Co.	5,000 T/M	Kawasaki, Japan	E.P.C.	1974
Sanyo Kokusaku Pulp Co.	2,600 T/M	Iwakuni, Japan	E.P.C.M.	1974
Kureha Chemical Industry Co., Ltd.	10,000 T/M	Nishiki, Japan	B.E.P.C.	1975
Mitsubishi Chemical Industries, Ltd.	3,400 T/M	Kurosaki, Japan	E.P.C.	1975

Client	Capacity	Location	Scope of Work	Year of Completion
Ryonichi Co., Ltd.	8,000 T/M	Mizusima, Japan	E.P.C.	1975
Nippon Carbide Industries Co., Ltd.	1,400 T/M	Uozu, Japan	B.E.P.C.M.	1980
Taiwan Chlorine Industries, Ltd.	9,300 T/M	Kaohsing, Taiwan	B.E.P.C.M.	1988
PT. Asahimas Subentra Chemical (AMS)	11,100 T/M	Anyer, Indonesia	E.P.C.	1989
V/O Techmashimport	16,700 T/M	Volgograd, Russia	E.P.CS.	1990

#### Chlorine

Kanegafuchi Chemical Industry Co., Ltd.	9,300 T/M	Takasago, Japan	E.P.C.M.	1974
Central Chemical Co.	4,600 T/M	Kawasaki, Japan	E.P.C.	1974
Sanyo Kokusaku Pulp Co.	2,400 T/M	Iwakuni, Japan	E.P.C.M.	1974
Kureha Chemical Industry Co., Ltd.	9,300 T/M	Iwaki, Japan	B.E.P.C.	1975
Mitsubishi Chemical Industries, Ltd.	3,200 T/M	Kurosaki, Japan	E.P.C.	1975
Ryonichi Co., Ltd.	7,400 T/M	Mizusima, Japan	E.P.C.	1975
Nippon Carbide Industries Co., Ltd.	1,300 T/M	Uozu, Japan	B.E.P.C.M.	1980
Taiwan Chlorine Industries Ltd.	8,600 T/M	Kaohsing, Taiwan	B.E.P.C.M.	1988
PT. Asahimas Subentra Chemical (AMS)	10,300 T/M	Anyer, Indonesia	E.P.C.	1989
V/O Techmashimport	15,500 T/M	Volgograd, Russia	E.P.CS.	1990

#### Hydrogen Chloride

Kanegafuchi Chemical Industry Co., Ltd.	500 T/M	Takasago, Japan	E.P.C.M.	1974
Central Chemical Co.	250 T/M	Kawasaki, Japan	E.P.C.	1974
Sanyo Kokusaku Pulp Co.	130 T/M	Iwakuni, Japan	E.P.C.M.	1974
Kureha Chemical Industry Co., Ltd.	500 T/M	Iwaki, Japan	B.E.P.C.	1975
Mitsubishi Chemical Industries Ltd.	170 T/M	Kurosaki, Japan	E.P.C.	1975
Ryonichi Co., Ltd.	400 T/M	Mizusima, Japan	E.P.C.	1975
Nippon Carbide Industries Co., Ltd.	70 T/M	Uozu, Japan	B.E.P.C.M.	1980
Taiwan Chlorine Industries Ltd.	460 T/M	Kaohsing, Taiwan	B.E.P.C.M.	1988
PT. Asahimas Subentra Chemical (AMS)	550 T/M	Anyer, Indonesia	E.P.C.	1989
V/O Techmashimport	830 T/M	Volgograd, Russia	E.P.CS.	1990

#### Hydrogen Chloride Recovery

Fuji Steel Co., Ltd.	Feed Acid	1.9 M <sup>3</sup> /H	Muroran, Japan	E.P.C.	1966
Yahata Steel Co., Ltd.	Feed Acid	2.7 M <sup>3</sup> /H	Sakai, Japan	B.E.P.C.	1967
Kawasaki Steel Co., Ltd.	Feed Acid	2.0 x 2 M <sup>3</sup> /H	Chiba, Japan	B.E.P.C.	1967
Nisshin Steel Co., Ltd.	Feed Acid	2.7 M <sup>3</sup> /H	Kure, Japan	B.E.P.C.	1968
Kawasaki Steel Co., Ltd.	Feed Acid	2.0 M <sup>3</sup> /H	Chiba, Japan	B.E.P.C.	1969
Nippon Steel Co., Ltd./ Tetsugen Corp.	Feed Acid	5.5 x 2 M <sup>3</sup> /H	Nagoya, Japan	B.E.P.C.	1971
Kawasaki Steel Co., Ltd.	Feed Acid	3.0 M <sup>3</sup> /H	Chiba, Japan	B.E.P.C.	1971
Nippon Steel Co., Ltd./ Tetsugen Corp.	Feed Acid	4.0 x 2 M <sup>3</sup> /H	Tobata, Japan	B.E.P.C.	1972
Kawasaki Steel Co., Ltd.	Feed Acid	4.0 M <sup>3</sup> /H	Mizushima, Japan	B.E.P.C.	1973
Nakayama Steel Co., Ltd.	Feed Acid	0.8 M <sup>3</sup> /H	Osaka, Japan	B.E.P.C.	1974
Nippon Steel Co., Ltd./ Tetsugen Corp.	Feed Acid	5.5 M <sup>3</sup> /H	Nagoya, Japan	B.E.P.C.	1976

Client	Capacity	Location	Scope of Work	Year of Completion
TDK Corp.	Feed Acid 1.0 M <sup>3</sup> /H	Narita, Japan	B.E.P.C.	1980
Nippon Steel Co., Ltd.	Feed Acid 5.0 M <sup>3</sup> /H	Sakai, Japan	B.E.P.C.	1984
TDK Corp.	Feed Acid 1.5 M <sup>3</sup> /H	Narita, Japan	B.E.P.C.	1984
Pohang Iron & Steel Co., Ltd./ Mitsubishi Heavy Industries, Ltd.	Feed Acid 5.7 M <sup>3</sup> /H	Cheonnam, Korea	B.E.P.C.	1989
Pohang Iron & Steel Co., Ltd./ Mitsubishi Heavy Industries, Ltd.	Feed Acid 3.0 M <sup>3</sup> /H	Cheonnam, Korea	B.E.P.C.	1990
Pohang Iron & Steel Co., Ltd./ Mitsubishi Heavy Industries, Ltd.	Feed Acid 6.4 M <sup>3</sup> /H	Cheonnam, Korea	B.E.P.C.	1990
Tokyo Steel MFG Co., Ltd.	Feed Acid 3.6 M <sup>3</sup> /H	Mizushima, Japan	B.E.P.C.	1995
The Siam United Steel Co., Ltd./Hitachi, Ltd.	Feed Acid 4.8 M <sup>3</sup> /H	Rayong, Thailand	B.E.P.C.	1999
Nisshin Steel Co., Ltd.	Feed Acid 2.0 M <sup>3</sup> /H	Toyo, Japan	B.E.P.C.	1999
Nippon Chemi-Con Corp.	Feed Acid 1.8 M <sup>3</sup> /H	Niigata, Japan	B.E.P.C.	2000

#### Hydrogen Peroxide

Nippon Peroxide Co., Ltd.	—	Kohriyama, Japan	E.P.C.	1966
Nippon Peroxide Co., Ltd.	Ex.	Kohriyama, Japan	E.P.C.	1968
Nippon Peroxide Co., Ltd.	Ex.	Kohriyama, Japan	E.P.C.	1977

#### Hydrazine

Mitsubishi Gas Chemical Co. Inc.	9,000 T/Y	Yokkaichi, Japan	B.E.P.C.	1989
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#### Polysulfide

Hokuetsu Paper Mills, Ltd.	600 M <sup>3</sup> /H	Shirakawa, Japan	E.P.	1987
Hokuetsu Paper Mills, Ltd.	200 M <sup>3</sup> /H	Hachinohe, Japan	E.P.	1990
Hokuetsu Paper Mills, Ltd.	181 M <sup>3</sup> /H	Niigata, Japan	E.P.C.	1993
Nippon Paper Industries Co., Ltd.	200 M <sup>3</sup> /H	Ishinomaki, Japan	E.P.C.	1994

#### Catalyst

Undisclosable	—	Kanagawa, Japan	E.P.C.	1993
Undisclosable	—	Toyama, Japan	E.P.C.	1998

#### Silicon/Silane

Undisclosable	Poly-Silicon	1,000 T/Y	Oregon, USA	F.	1986
Undisclosable	Poly-Silicon Pilot	—	Arizona, USA	B.E.P.C.	1987
Undisclosable	Silane	20 T/Y	Japan	E.P.C.	1989
Undisclosable	Poly-Silicon	1,500 T/Y	Japan	F.	1996
Undisclosable	Poly-Silicon	3,000 T/Y	Sarawak, Malaysia	F	2009
Undisclosable	Poly-Silicon	6,000 T/Y	Sarawak, Malaysia	E.P.C. ※	2013
Undisclosable	Poly-Silicon	13,800 T/Y	Sarawak, Malaysia	E.P.C.	2014

※ C: Chiyoda Sarawak Sdn. Bhd.

Client	Capacity	Location	Scope of Work	Year of Completion
<b>Sulfur Trioxide/Sulfonic Acid</b>				
Chevron Chemical (Far East) Co.	Sulfonic Acid 4,500 T/Y	Pulau Sakura, Singapore	E.P.C.	1998
Chevron Chemical (Far East) Co.	Sulfur Trioxide 800 T/Y	Pulau Sakura, Singapore	E.P.C.	1998
<b>Sulfuric Acid</b>				
Hankook Caprolactum Corp.	136 T/D	Ulsan, Korea	B.E.P.S.	1988

## Others

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Lubricant Aditives</b>				
Oronite Japan Ltd.	—	Omaezaki, Japan	E.P.C.	1989
Oronite Japan Ltd.	—	Omaezaki, Japan	E.P.C.	1995
Chevron Chemical (Far East) Co.	100,000	Pulau Sakura, Singapore	E.P.C.	1998
<b>Carbon Black</b>				
Korea Continental Carbon Co., Ltd.	7,500	Inchon, Korea	E.P.CS.	1969
<b>Toner</b>				
Sekisui Chemical Co., Ltd.	—	Shiga, Japan	E.	1990
Mita South Carolina, Inc.	—	S.Carolina, USA	E.P.C.	1991
Nihon Zeon Co., Ltd.	1,000	Tokuyama, Japan	E.P.C.	1995
<b>Photoresist</b>				
JSR Corp.	—	California, USA	E.P.C .	1996
Undisclosable	—	Undisclosable	E.P.C .	2001
<b>Epoxy Soybean Oil</b>				
Oxirane Chemical Co., Ltd.	10,400	Mie, Japan	E.P.C.	1969
<b>Corn Starch</b>				
Japan Maize Products Co., Ltd.	500 T/D	Fuji, Japan	E.P.C.	1965

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
<b>Corn Syrup</b>				
Fuji Toka Co., Ltd.	—	Fuji, Japan	E.P.C.	1966
<b>Sorbitor</b>				
Towa Chemical Industry Co., Ltd.	12,000	Fuji, Japan	E.P.C.	1966
Towa Chemical Industry Co., Ltd.	18,000	Fuji, Japan	E.P.C.	1969
Towa Chemical Industry Co., Ltd.	12,000	Fuji, Japan	E.P.C.	1970
Towa Chemical Industry Co., Ltd.	Powder 2,400	Fuji, Japan	E.P.C.	1970
Towa Chemical Industry Co., Ltd.	Powder 4,800	Fuji, Japan	E.P.C.	1971
PT. Sorini Towa Berlian Co.	7,000	Surabaya, Indonesia	E.P.C.	1996
<b>Sugar Ester</b>				
Dainippon Sugar Manufacturing Co., Ltd.	1,200	Yokohama, Japan	E.P.C.	1967
Ryoto Co., Ltd.	1,200	Yokkaichi, Japan	E.P.C.	1974
<b>Aspartame</b>				
Holland Sweetener Co. vof.	—	Gleen, Netherlands	E.P.C.	1988
<b>Sodium Glutamate</b>				
Ajinomoto Co., Ltd.	3,600	Yokohama, Japan	B.E.P.C.	1962
Ajinomoto Co., Ltd.	7,200	Yokkaichi, Japan	B.E.P.C.	1966
<b>Amino Caprolactam</b>				
Toray Industries, Inc.	5,000	Nagoya, Japan	B.E.P.C.	1988
<b>Pigment</b>				
Dainippon Ink & Chemicals, Inc.	Cyanine 3,720	Kashima, Japan	B.E.P.C.	1972
Dainippon Ink & Chemicals, Inc.	Azo 3,600	Kashima, Japan	B.E.P.C.	1972
<b>Plastisizer</b>				
Dainippon Ink & Chemicals, Inc.	20,000	Chiba, Japan	E.P.C.	1982
<b>Plastic Waste Oil Recovery</b>				
Rekisei Koyu K.K./ Plastic Waste Management Institute	6,000	Niigata, Japan	B.E.P.C.	1997
<b>Solvent Recovery</b>				
Rasa Industries, Ltd.	Undisclosable	Isezaki, Japan	E.P.C.	1996
<b>PCB Detoxification</b>				
Undisclosable	2.0 Ton/day	Undisclosable	B.	2006
<b>Refrigerated Gaseous Tanks Facility for Ethylene and Propylene</b>				
Dialog Plant Services Sdn. Bhd.	—	Pengerang, Johor State, Malaysia	E.P.C.C.	(2019)

# Flue Gas Desulfurization Plants



CT-121 FGD Plants ..... 70

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**Scope of Work**      E: Engineering  
                                 P: Procurement  
                                 C: Construction  
                                 L: License

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# CT-121 FGD Plants

Client	Flue Gas Source	Capacity: More than 300MWe (Nm <sup>3</sup> /h) (MWe)		Location	Scope of Work	Year of Completion
Hokuriku Electric Power Company	Boiler, Oil	1,051,000	350	Fukui, Japan	E.P.C.	1990
Chubu Electric Power Co., Inc.	Boiler, Coal	1,153,000 x 2	350 x 2	Hekinan, Japan	E.P.C.	1993
Hokuriku Electric Power Company	Boiler, Coal	1,539,000	500	Nanao-ohta, Japan	E.P.C.	1995
Suncor Inc.	Boiler, Petroleum Coke	1,172,000	350	Alberta, Canada	E.P.C.	1996
Hokuriku Electric Power Company	Boiler, Coal	2,186,000	700	Nanaohta, Japan	E.P.C.	1998
Tohoku Electric Power Co., Inc.	Boiler, Coal	3,003,000	1,000	Haranomachi, Japan	E.P.C.	1998
Korea Electric Power Corporation	Boiler, Oil	1,114,000	400	Ulsan, Korea	E.L.	1999
Korea Electric Power Corporation	Boiler, Oil	1,114,000	400	Ulsan, Korea	E.L.	1999
Korea Electric Power Corporation	Boiler, Oil	1,114,000	400	Ulsan, Korea	E.L.	1999
Kobe Steel Ltd.	Boiler, Coal	2,270,000	700	ShinkoKobe, Japan	E.P.C.	2002
Kobe Steel Ltd.	Boiler, Coal	2,270,000	700	ShinkoKobe, Japan	E.P.C.	2004
Kansai Electric Power Co., Inc.	Boiler, Coal	2,700,000	900	Maizuru, Japan	E.P.C.	2004
Guohua Electric Power Corporation	Boiler, Coal	2,131,000	600	Taishan, Guangdong, China	L	2005
Guohua Electric Power Corporation	Boiler, Coal	2,131,000	600	Taishan, Guangdong, China	L	2005
Huaneng Power International, Inc.	Boiler, Coal	1,108,080	330	Huaiyin, Jiangsu, China	L	2005
Huaneng Power International, Inc.	Boiler, Coal	1,108,080	330	Huaiyin, Jiangsu, China	L	2005
Huaneng Power International, Inc.	Boiler, Coal	1,108,080	330	Huaiyin, Jiangsu, China	L	2006
Huaneng Power International, Inc.	Boiler, Coal	1,108,080	330	Huaiyin, Jiangsu, China	L	2006
Guohua Electric Power Corporation	Boiler, Coal	2,131,000	600	Taishan, Guangdong, China	L	2006
Guohua Electric Power Corporation	Boiler, Coal	2,131,000	600	Taishan, Guangdong, China	L	2006
Guohua Electric Power Corporation	Boiler, Coal	2,131,000	600	Taishan, Guangdong, China	L	2006
Beijing Deyuan Investment Co., Ltd.	Boiler, Coal	2,160,000	600	Diandong, Yunnan, China	L	2006
Beijing Deyuan Investment Co., Ltd.	Boiler, Coal	2,160,000	600	Diandong, Yunnan, China	L	2007
Beijing Deyuan Investment Co., Ltd.	Boiler, Coal	2,160,000	600	Diandong, Yunnan, China	L	2007
Beijing Deyuan Investment Co., Ltd.	Boiler, Coal	2,160,000	600	Diandong, Yunnan, China	L	2007
Shanxi Hexin. Power Development Co., Ltd.	Boiler, Coal	2,221,000	600	Wuxiang, Shanxi, China	L	2006
Shanxi Hexin. Power Development Co., Ltd.	Boiler, Coal	2,221,000	600	Wuxiang, Shanxi, China	L	2007
Dayton Power & Light Co.	Boiler, Coal	2,758,000	635	Killen, OH, USA	E.L.	2007
Dayton Power & Light Co.	Boiler, Coal	2,661,000	610	J.M. Stuart, OH, USA	E.L.	2008
Dayton Power & Light Co.	Boiler, Coal	2,661,000	610	J.M. Stuart, OH, USA	E.L.	2008
Dayton Power & Light Co.	Boiler, Coal	2,661,000	610	J.M. Stuart, OH, USA	E.L.	2008
Dayton Power & Light Co.	Boiler, Coal	2,661,000	610	J.M. Stuart, OH, USA	E.L.	2008
PowerSouth Energy Cooperative	Boiler, Coal	1,314,000	340	Lowman, AL, USA	E.L.	2008
Georgia Power Co.	Boiler, Coal	4,067,000	950	Bowen, GA, USA	E.L.	2008
Georgia Power Co.	Boiler, Coal	4,067,000	950	Bowen, GA, USA	E.L.	2008
Georgia Power Co.	Boiler, Coal	4,067,000	950	Wansley, GA, USA	E.L.	2008
American Electric Power Co.	Boiler, Coal	2,362,000	620	Cardinal, OH, USA	E.L.	2008
American Electric Power Co.	Boiler, Coal	2,362,000	620	Cardinal, OH, USA	E.L.	2008
American Electric Power Co.	Boiler, Coal	3,084,000	850	Consesville, OH, USA	E.L.	2009
Georgia Power Co.	Boiler, Coal	4,067,000	950	Wansley, GA, USA	E.L.	2009
Georgia Power Co.	Boiler, Coal	3,267,000	756	Bowen, GA, USA	E.L.	2009
Gulf Power Co.	Boiler, Coal	4,348,000	984	Crist, FL, USA	E.L.	2009
Beijing Deyuan Investment Co., Ltd.	Boiler, Coal	1,980,000	600	Diandong, Yunnan, China	L	2009



Client	Flue Gas Source	Capacity: More than 300MWe (Nm <sup>3</sup> /h) (MWe)		Location	Scope of Work	Year of Completion
Alabama Power Co.	Boiler, Coal	4,067,000	950	Gaston, AL, USA	E.L.	2010
Georgia Power Co.	Boiler, Coal	3,267,000	756	Bowen, GA, USA	E.L.	2010
Alabama Power Co.	Boiler, Coal	3,267,000	773	Barry, AL, USA	E.L.	2010
American Electric Power Co.	Boiler, Coal	2,854,000	665	Cardinal, OH, USA	E.L.	2010
Kansai Electric Power Co., Inc.	Boiler, Coal	2,700,000	900	Maizuru, Japan	E.P.C.	2010
Dong Energy	Boiler, Coal	1,054,000	400	Asnaes, Denmark	E.L.	2010
American Electric Power Co.	Boiler, Coal	1,900,000	450	Kyger Creek, OH, USA	E.L.	2012
American Electric Power Co.	Boiler, Coal	2,850,000	675	Kyger Creek, OH, USA	E.L.	2012
American Electric Power Co.	Boiler, Coal	2,895,000	675	Clifty Creek, OH, USA	E.L.	2013
American Electric Power Co.	Boiler, Coal	2,895,000	675	Clifty Creek, OH, USA	E.L.	2013



# Pharmaceutical Plants



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**Scope of Work**      E: Engineering  
                                 P: Procurement  
                                 C: Construction  
                                 V: Validation

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# Pharmaceutical

Client	Type	Location	Scope of Work	Year of Completion
Nippon Boehringer Ingelheim Co., Ltd.	Finishing, Commercial	Shiga, Japan	E.	1995
Eiken Chemical Co., Ltd.	Aseptic, Commercial	Tochigi, Japan	E.P.C.V.	1995
Seikagaku Corporation	API, Clinical	Tokyo, Japan	E.P.C.V.	1995
Shimizu Pharma	Aseptic, Commercial	Shizuoka, Japan	E.	1995
Toyobo Co., Ltd.	Bio	Shiga, Japan	E.P.C.	1995
Kyowa Hakko Co., Ltd.	Bio, Clinical	Yamaguchi, Japan	E.	1996
Fukuzyu Pharmaceuticals Co., Ltd.	API, Commercial	Toyama, Japan	E.P.C.V.	1996
Pharmacia-Upjhon	Finishing, Commercial	Ibarakik, Japan	E.P.C.V.	1997
Kanebo Ltd.	API, Clinical	Saitama, Japan	E.P.C.V.	1997
Eisai Chemical Co., Ltd.	API, Clinical	Ibaraki, Japan	E.P.C.V.	1997
Kuraray Co., Ltd.	API, Commercial	Niigata, Japan	E.P.C.V.	1998
JATRON Laboratories Inc.	Finishing, Commercial	Chiba, japan	E.P.C.V.	1999
Japan Tissue Engineering Co., Ltd.	API, Commercial	Aichi, Japan	E.P.C.	1999
Sumica fine Chem. Co., Ltd.	API, Commercial	Okayama, Japan	E.P.C.V.	1999
Teijin Ltd.	Finishing, Commercial	Tokyo, Japan	E.	1999
Nissan Chemical Industries, Ltd.	API, Commercial	Yamaguchi, Japan	E.P.C.V.	2000
Sumitomo Pharmaceuticals	Finishing, Clinical	Osaka, Japan	E.P.C.V.	2000
Fujisawa Pharmaceuticals Co., Ltd.	Aseptic, Commercial	Toyama, Japan	E.P.C.V.	2001
Banyu Pharmaceutical Co., Ltd.	Highly Potent API, Clinical	Aichi, Japan	E.Cm.V.	2001
Daiichi Yakuhin Kougyou Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C.	2002
Bayer Yakuhin, Ltd.	Bio, Clinical	Shiga, Japan	E.	2002
Sumitomo Chemical Co., Ltd.	Highly Potent API, Commercial	Oita, Japan	E.	2002
Pharmacia	Finishing, Commercial	Korea	E.Cm.V.	2002
Ajinomoto Pharmaceuticals Co., Ltd.	Finishing, Commercial	Fukushima, Japan	E.P.C.V.	2002
FUJIFILM Finechemicals Co., Ltd.	API, Clinical	Fukushima, Japan	E.P.C.V.	2002
Kirin Brewery Company., Limited./ Kirin Engineering Company., Limited	Bio, Commercial	Gunma, Japan	E.P.C.V.	2003
Mikuni Pharmaceutical Industrial Co., Ltd.	API, Commercial	Osaka, Japan	E.P.C.V. ※	2003
Taiho Pharmaceutical Co., Ltd.	Highly Potent API, Commercial	Saitama, Japan	E.P.C.V.	2003
Menicon Co., Ltd.	Finishing, Commercial	Aichi, Japan	E.P.C.V. ※	2004
Tokyo Metropolitan School Personnel In Service Training Center	API, Commercial	Tokyo, Japan	E.	2004
Mitsubishi Tanabe Pharma Factory Ltd.	Bio, Clinical	Kanagawa, Japan	E.P.C.V. ※	2005
Air Water Inc.	API, Commercial	Ibaraki, Japan	E.P.C.V. ※	2005
Astellas Pharma Inc.	Finishing, Commercial	Ireland	E.	2006
Asahi Kasei Pharma Corporation	Finishing, Commercial	Aichi, Japan	E.P.C.V. ※	2006
Fujirebio Inc.	Finishing, Commercial	Yamaguchi, Japan	E. ※	2006
Juzen Chemical Corporation	API, Commercial	Toyama, Japan	E.P.C.V. ※	2006
Dainippon Sumitomo Pharma Co., Ltd.	Finishing, Clinical, Commercial	Osaka, Japan	E.P.C.V.	2006
Kongo Chemical Co., Ltd.	API, Commercial	Toyama, Japan	E.P.C.V. ※	2007
Janssen Pharmaceutical K.K.		Shizuoka, japan	E.P.C.V. ※	2007
Eisai Co., Ltd.	API, Finishing Clinical, Commercial	India	E.	2007
Eisai Co., Ltd.	API, Clinical	Ibaraki, Japan	E.P.C.V.	2007
Kongo Chemical Co., Ltd.	API, Commercial	Toyama, Japan	E.P.C.V. ※	2007

# Pharmaceutical

Client	Type	Location	Scope of Work	Year of Completion
Becton, Dickinson and Company.	Finishing, Commercial	Fukushima, Japan	E. ※	2007
Shionogi & Co., Ltd.	API, Clinical	Hyogo, Japan	E.P.C.V.	2007
Wakamoto Pharmaceutical Co., Ltd.	Bio, API, Commercial	Kanagawa, Japan	E.P.C.V.	2008
Eisai Co., Ltd.	API, Commercial	Ibaraki, Japan	E.P.C.V.	2008
Fresenius Medical Care Japan K.K.	Aceptic, Commercial	Fukuoka, Japan	E.P.C.V.	2008
Maruho Co., Ltd.	Finishing, Commercial	Shiga, Japan	E.P.C.V. ※	2008
Kokando, Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C. ※	2008
Ajinomoto Pharmaceuticals Co., Ltd.	Finishing, Commercial	Shizuoka, Japan	E.P.C.	2008
Nichi-Iko Pharmaceutical Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C.V. ※	2008
Nichi-Iko Pharmaceutical Co., Ltd.	Finishing, Commercial	Aichi, Japan	E.P.C.V. ※	2008
Central Glass Co., Ltd.	API, Commercial	Yamaguchi, Japan	E.P.C.V.	2008
Nippon Shinyaku Co., Ltd.	Finishing, Commercial	Kanagawa, Japan	E.P.C.V.	2008
Wakamoto Pharmaceutical Co., Ltd.	Finishing, Commercial	Kanagawa, Japan	E.P.C.	2009
Eisai Co., Ltd.	API, Commercial	Ibaraki, Japan	E.P.C.V.	2009
Nihon Generic Co., Ltd.	Finishing, Commercial	Ibaraki, Japan	E.P.C. ※	2009
Maruho Co., Ltd.	Finishing, Commercial	Shiga, Japan	E.P.C.V. ※	2009
Eisai Co., Ltd.	Finishing, Commercial	Saitama, Japan	V.	2009
Nichi-Iko Pharmaceutical Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C.V. ※	2010
Kihara Memorial Yokohama Foundation for the Advancement of Life Sciences	Bio Clinical	Yokohama, Japan	E.P.C.V.	2011
Astellas Pharma Inc.	Finishing Clinical	Shizuoka, Japan	E.P.C.V.	2013
UNIGEN Inc.	Bio, API, Commercial	Gifu, Japan	E.P.C.V.	2013
Wako Pure Chemical Industries, Ltd.	Finishing, Commercial	Mie, Japan	E.P.C.V.	2014
The Research Foundation for Microbial Diseases of Osaka University	Finishing, Commercial	Kagawa, Japan	E.P.C.V.	2015
Institute of Industrial Promotion Kawasaki	Innovation Center	Kanagawa, Japan	E.P.C.	2015
KNC Laboratories Co., Ltd.	Nucleic acid, peptide	Izumo, Japan	E.P.C.V.	2015
I'rom Group Co., Ltd. / ID Pharma Co., Ltd.	Vectors for gene therapy and regenerative medicine, Commercial	Ibaraki, Japan	E.P.C.V.	2016
Nichi-Iko Pharmaceutical Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C.V. ※	2018
CMIC CMO Co., Ltd.	Finishing, Commercial	Tochigi, Japan	E.P.C.V.	(2018)
Nippon Shokubai Co., Ltd.	API Commercial	Osaka, Japan	E.P.C.V. ※	(2018)
Tosoh Corporation	Officers	Yamaguchi, Japan	E.P.C.	(2018)

※ Main Contractor: Chiyoda Techno Ace Co., Ltd.



# Photovoltaic Power Plants, Green Device and Non-Ferrous Metal Plants Transportation



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**Scope of Work**

FEED: Front End Engineering Design  
E: Engineering  
P: Procurement  
C: Construction

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# Photovoltaic Power Plants

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Solar Frontier K.K.	CIS Photovoltaic Power Plant (Rooftop)	2,000kW	Miyazaki, Japan	E.P.C.	2011
INPEX CORPORATION	CIS Photovoltaic Power Plant (On Ground)	2,300kW	Niigata, Japan	E.P.C.	2013
AIKAWA PRESS INDUSTRY Co., LTD.	CIS Photovoltaic Power Plant (On Ground)	1,800kW	Yamanashi, Japan	E.P.C.	2013
SHOWA SHELL SEKIYU K.K.	CIS Photovoltaic Power Plant (Rooftop)	2,400kW	Miyazaki, Japan	E.P.C.	2013
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	5,200kW	Mie, Japan	E.P.C.	2013
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,500kW	Mie, Japan	E.P.C.	2013
OR Solar Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,500kW	Toyama, Japan	E.P.C.	2013
LM Sun Power Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,500kW	Ibaraki, Japan	E.P.C.	2013
LM Sun Power Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,600kW	Fukui, Japan	E.P.C.	2013
LM Sun Power Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,600kW	Fukuoka, Japan	E.P.C.	2014
Japan Petroleum Exploration Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,400kW	Hokkaido, Japan	E.P.C.	2014
Seibu Oil Company Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	10,400kW	Yamaguchi, Japan	E.P.C.	2014
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,400kW	Mie, Japan	E.P.C.	2014
MITSUI & Co., Ltd	CIS Photovoltaic Power Plant (On Ground)	19,600kW	Aichi, Japan	E.P.C.	2014
Solar Frontier K.K.	CIS Photovoltaic Power Plant (On Ground)	880kW	Miyazaki, Japan	E.P.C.	2014
AIDEX CO., LTD.	CIS Photovoltaic Power Plant (On Ground)	2,600kW	Yamaguchi, Japan	E.P.C.	2015
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	4,500kW	Mie, Japan	E.P.C.	2015
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,900kW	Mie, Japan	E.P.C.	2015
INPEX LOGISTICS (JAPAN) CO.,LTD.	CIS Photovoltaic Power Plant (On Ground)	2,500kW	Niigata, Japan	E.P.C.	2015
LM Sun Power Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	8,800kW	Miyagi, Japan	E.P.C.	2015
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	15,500kW	Mie, Japan	E.P.C.	2015
Niigata Shimami Solar Park LLC.	CIS Photovoltaic Power Plant (On Ground)	14,200kW	Niigata, Japan	E.P.C.	2016
Nagasaki Solar Energy Godo Kaisha	CIS Photovoltaic Power Plant (On Ground)	29,700kW	Nagasaki, Japan	E.P.C.	2016
LM Sun Power Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	8,200kW	Fukushima, Japan	E.P.C.	2016
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	14,000kW	Mie, Japan	E.P.C.	2017
Sanco Real Estate Co., Ltd.	CIS Photovoltaic Power Plant (On Ground)	12,800kW	Mie, Japan	E.P.C.	2017
Solar Frontier K.K.	CIS Photovoltaic Power Plant (On Ground)	13,000kW	Iwate, Japan	E.P.C.	2017
SDT Solar Power K.K.	CIS Photovoltaic Power Plant (On Ground)	17,300kW	Yamaguchi, Japan	E.P.C.	2017
Pacifico Energy Toyota LLC	Photovoltaic Power Plant (On Ground)	62,000kW	Aichi, Japan	E.P.C.	(2019)



## Green Device

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Undisclosed	Flexible Printed Circuit Plant	—	Fukuoka, Japan	E.P.C.	2005
Undisclosed	Precious Metal Recycle Plant	—	Chiba, Japan	E.P.C.	2009
Mitsubishi Corporation	Lithium Ion Battery Plant	—	Shiga, Japan	E.P.C.	2011
Solar Frontier K.K.	CIS Photovoltaic Production Plant	900MW/year	Miyazaki, Japan	FEED, E.P.C.	2011
Solar Frontier K.K.	CIS Photovoltaic Production Plant	150MW/year	Miyagi, Japan	E.P.C.	2015
Undisclosed	Ceramic Fiber Plant	—	Japan	E.P.C.	2016
Undisclosed	Precious Metal Recycle Plant	—	Chiba, Japan	E.P.C.	(2018)

## Non-Ferrous Metal Plants

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
P.T. Smelting Co.	Copper Cathode Plant	200,000 ton/year	Indonesia	E.P.C.	1998
Myanmar Ivanhoe Copp	Copper Cathode Plant	25,000 ton/year	Myanmar	E.P.C.	1998
Toho Titanium Co., Ltd.	Titanium Chlorination & Distillation Plant	4,000 ton/month	Fukuoka, Japan	E.P.C.	2009
Toho Titanium Co., Ltd.	Titanium Chlorination & Distillation Plant	30% increase	Fukuoka, Japan	E.P.C.	2012
Taganito HPAL Nickel Corporation	Nickel/Cobalt Mixed Sulfide Plant	30,000 ton/year	Taganito, Philippine	E.P.C.	2013
Toho Titanium Co., Ltd. and Advanced Metal Industries Cluster Company Ltd.	Titanium Sponge Plant	15,600 ton/year	Yanbu, Saudi Arabia	E.P.C.	2017

## Transportation Project

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Department of Transportation and Communication, the Government of the Republic of the Philippines	Airport	—	Panglao Island, Bohol province, the Republic of the Philippines	P.C.	(2018)
Civil Aviation Authority of Mongolia	Airport	—	Ulaanbaatar, Mongolia	P.C.	2017

# Memo

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