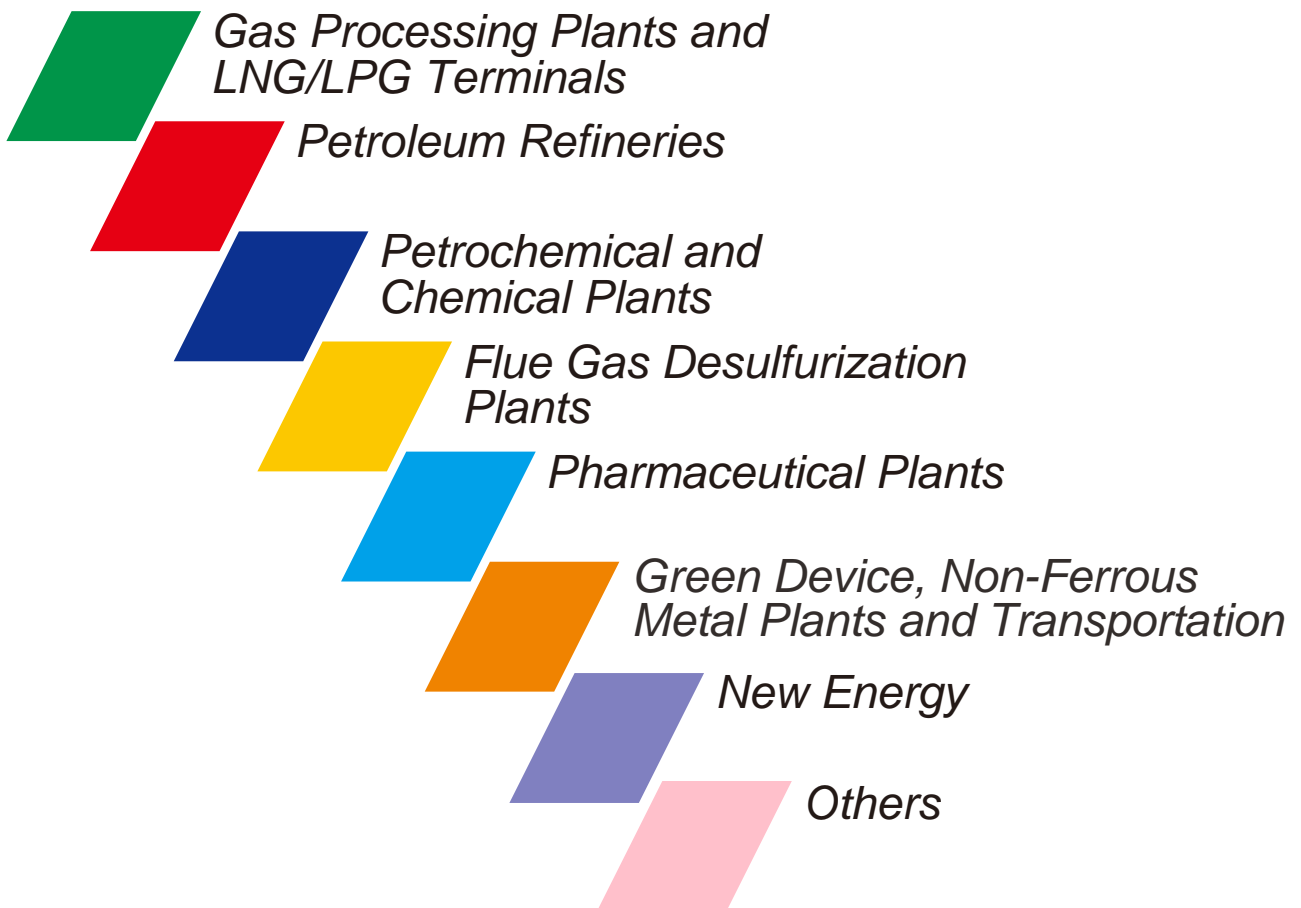


# MAJOR PROJECTS

on



# MAJOR PROJECTS

as of December 2024

	Page
<b>1. Gas Processing Plants and LNG/LPG Terminals</b>	
1. Scope of Work	3
1-1. Gas Processing Plants	4
1-2. LNG Plants (FEED/PS)	5
1-3. LNG Plants (EPC)	6
1-4. Floating Unit (FLNG/FPU/FSRPU)	7
1-5. Helium Recovery Unit	8
1-6. Acid Gas Removal	9
1-7. Sulfur Recovery Units	11
1-8. LNG Terminals	12
1-9. LPG Terminals	14
1-10. CCS (Carbon Capture & Storage)	15
<b>2. Petroleum Refineries</b>	
2. Scope of Work	16
2-1. Crude Distillation Units	17
2-2. Vacuum Flasher/Vacuum Distillation Units	19
2-3. Catalytic Reforming Units	20
2-4. Gasoline Selective Desulfurization Units	22
2-5. Naphtha and Middle Distillate Hydrodesulfurization Units	23
2-6. Vacuum Gas Oil Hydrodesulfurization Units	26
2-7. Hydrocracking Units	27
2-8. Fluid Catalytic Cracking Units	28
2-9. Residuum Hydrodesulfurization Units	29
2-10. Visbreaking Units	30
2-11. Thermal Cracking Units	31
2-12. Solvent Deasphalting Units	32
2-13. Sweetening Units	33
2-14. Alkylation Units	35
2-15. Isomerization Units	36
2-16. Distillate Dewaxing Units	37
2-17. Hydrogen Manufacturing Units	38
2-18. Sulfur Recovery Units	39
2-19. Claus Tail Gas Treating Units	40
2-20. H <sub>2</sub> S Removal Units with Amine	41
2-21. Sour Water Stripping Units	43
2-22. Blown Asphalt (Bitumen) Units	45
2-23. Condensate Splitter Units	46
2-24. Lubricating Oil Refining Units	47

**3. Petrochemical and Chemical Plants**

3.	Scope of Work	49
3-1.	Ethylene and Its Derivatives	50
3-2.	Propylene and Its Derivatives	53
3-3.	C <sub>4</sub> /C <sub>5</sub> Fractions and Derivatives	55
3-4.	Aromatics	57
3-5.	Paraffin/Methane/Acetylene Derivatives/Oleo Chemicals	62
3-6.	Engineering Plastics	63
3-7.	Synthesis Gas/Fertilizers	64
3-8.	Coal Chemicals	66
3-9.	Inorganic Chemicals	67
3-10.	Others	69

**4. Flue Gas Desulfurization Plants**

4.	Scope of Work	70
4-1.	CT-121 FGD Plants	71

**5. Pharmaceutical Plants**

5.	Scope of Work	73
5-1.	Pharmaceutical	74

**6. Green Device, Non-Ferrous Metal Plants and Transportation**

6.	Scope of Work	76
6-1.	Green Device	77
6-2.	Non-Ferrous Metal Plants	78
6-3.	Transportation Project	79

**7. New Energy**

7.	Scope of Work	80
7-1.	Photovoltaic Power Plants	81
7-2.	Biomass Firing Power Plant	82
7-3.	Battery and Decentralized Energy System	83
7-4.	Biofuel Plant	84
7-5.	Power to Liquid/Gas	85
7-6.	Offshore Wind Farm	86

**8. Others**

8.	Scope of Work	87
8-1.	Others	88

# 1. Gas Processing Plants and LNG/LPG Terminals

## Scope of Work

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

# 1-1. Gas Processing Plants

(for Hydrogen Manufacturing Units please see page [2-17. Hydrogen Manufacturing Units],  
for Synthesis Gas / Fertilizers please see page [3-7. Synthesis Gas/Fertilizers])

Client	Type of Plant	Type	Capacity (T/Y)	Location	Scope of Work	Year of Completion
Kharg Chemical Co., Ltd.	LPG/Sulfur Plant	LPG Sulfur NGL	200,000 200,000 20,000	Kharg Is., Iran	E.P.C.	1969
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS)	LNG/LPG Plant Train 1 & 2	LNG LPG NGL	1,100,000 x 2 544,000 x 2 110,000 x 2	Das Is., U.A.E.	B.E.P.C.	1976
State Organization for Oil Projects (SCOP)	Dew Point Control Plant	Sales Gas NGL	194MM SCFD 180,000	North Rumalia & Nassiriyah, Iraq	E.P.C.	1977
Qatar General Petroleum Corp. (QGPC)	LPG/NGL Recovery Plant	LPG NGL	660,000 300,000	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 NGL (C <sub>3</sub> +)	495MM SCFD 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 NGL	55 MM SCFD 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 (Train 3)	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 LPG	2,500,000 460,000	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 LPG	2,950,000 83,000	Bontang, Indonesia	FEED	2001
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
Ras Laffan Liquefied Natural Gas Co., Ltd. (RasGas)	NGL Plant		740 x 2 MM SCFD		FEED	2002
PetroChina International Jabung Ltd.	Gas Processing Plant	Sales Gas LPG Condensate	100 MMSCFD 15,200BPSD 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
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
<b>【GTL/DME】</b>						
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
<b>【Gas Related Infrastructure】</b>						
Qatar Petroleum	Common Cooling Water System		300,000M <sup>3</sup> /h	Ras Laffan, Qatar	E.P.C.M.	2003
<b>【Flow Assurance】</b>						
RasGas Company Limited	Onshore Storage, Pumping and Loading Facilities		—	Ras Laffan, Qatar	E.P.C.	2015

## 1-2.LNG Plants (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	2.95	Train-1	Bontang, Indonesia	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
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 & 2	Cabo Delgado, Mozambique	FEED	2014
Golden Pass LNG	5.2 x 3	Golden Pass LNG Export Project	Sabine Pass, Texas, U.S.A.	FEED	2015
BP Berau Ltd.	3.8	Train 3	West Papua, Indonesia	FEED	2016
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 Canada Development Inc.	6.0 x 2	LNG Canada Project	Kitimat, BC, Canada	FEED	2018
Qatargas Operating Company Limited	7.8 x 4	North Field Expansion Onshore Facilities Train 8-11	Ras Laffan, Qatar	FEED	2019
Nigeria LNG Ltd.	4.3 4.0	Train 7	Bonny Island, Nigeria	FEED	2020

## 1-3.LNG Plants (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)	2.5	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
Qalhat LNG S.A.O.C.	3.3	Qalhat Train	Qalhat, Oman	E.P.C.M.	2005
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	3.0	Train 1, 2 & 3, Debottlenecking	Ras Laffan, Qatar	E.P.C.	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
JSC Yamal LNG	5.5 x 3	Yamal LNG Project	Sabetta, Yamal-Nenets, Russia	E.P.C.	2019
Cameron LNG, LLC	4.5 x 3	Cameron Liquefaction Project	Hackberry, Louisiana, U.S.A.	E.P.C.	2020
FLNG Liquefaction 3, LLC	Nominal 4.64 x 1	Freeport LNG Export Project Train 3	Freeport, Texas, U.S.A.	E.P.C.	2020
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.	2020
BP Berau Ltd.	3.8	Train 3	West Papua, Indonesia	E.P.C.	2023
Golden Pass LNG	5.2 x 3	Train 1, 2, 3	Sabine Pass, Texas, U.S.A.	E.P.C.	(Undisclosable)
Nigeria LNG Ltd.	8.0	Train 7	Bonny Is., Nigeria	E.P.	(Undisclosable)
Qatar Petroleum	8.0 x 4	North Field East (NFE) Project Onshore LNG Facilities	Ras Laffan, Qatar	E.P.C.	(Undisclosable)
Total E&P Mozambique Area 1 Ltd.	6.44 x 2	Train 1 & 2	Cabo Delgado, Mozambique	E.	(Undisclosable)

## 1-4.Floating Unit (FLNG/FPU/FSRPU)

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
<b>【Floating Production Unit (FPU)】</b>					
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
<b>【Floating Storage Regasification Power Unit (FSRPU)】</b>					
Kumul Petroleum Holdings Limited	140,000m3 LNG storage, 75MW Power Generation	FSRPU	Lae, Papua New Guinea	Design, Development and Engineering	(Undisclosable)



## 1-5. 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
Qatargas Operating Company Ltd.	—	Helium3	Ras Laffan, Qatar	E.P.C.	2019
Qatar Petroleum	—	Helium4	Ras Laffan, Qatar	E.P.C.	(Undisclosable)

## 1-6.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.C.S.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
Abu Dhabi Gas Liquefaction Co., Ltd. (ADGAS) (Train 3)	Benfield Hi-Pure	Das Is., Abu Dhabi	E.P.C.M.	1994
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
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
Pertamina (Train I)	aMDEA	Bontang, Indonesia	FEED	2001
Pertamina/BP Berau Ltd.	aMDEA	Irian Jaya, Indonesia	FEED	2001
Union Fenosa Gas S.A.	aMDEA	Damietta, Egypt	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
ExxonMobil Middle East Gas Marketing Ltd.	Ucarsol	Ras Laffan, Qatar	E.P.C.	2005
PetroChina International Jabung Ltd.	aMDEA	Jambi, Indonesia	E.P.C.	2005
Qalhat LNG S.A.O.C.	Sulfinol	Qalhat, Oman	E.P.C.	2005
Qatar Liquefied Gas Co., Ltd. (QATARGAS) (Train 1, 2 & 3 Debottlenecking)	Sulfinol	Ras Laffan, Qatar	E.P.C.	2005
Qatar Petroleum & Conocophillips Qatar Ltd. (Train 6 & 7)	aMDEA	Ras Laffan, Qatar	FEED	2005
Ras Laffan Liquefied Natural Gas Co., Ltd. (II) (RasGas II) (Train 4)	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)	Prosermat	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
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 Barzan Limited	Ucarsol	Ras Laffan, Qatar	FEED	2010
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
Qatar Shell GTL Limited	Sulfinol	Ras Laffan, Qatar	E.P.C.	2011
Arrow Energy Pty Ltd.	ADIP	Curtis Island, Australia	FEED	2012
JSC Yamal LNG	aMDEA	Yamal Peninsula, Russia	FEED	2013
Woodside Energy Ltd.	BASF	James Price Point, Australia	FEED	2013
Anadarko Mozambique Area 1, Limitada	aMDEA	Cabo Delgado, Mozambique	FEED	2014

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
Golden Pass LNG	Ucarsol	Sabine Pass, Texas, U.S.A.	FEED	2015
Sonatrach	aMDEA	Arzew, Algeria	E.P.C.M.	2015
Freeport LNG Expansion, L.P.	aMDEA	Freeport, Texas, U.S.A.	FEED	2018
Cameron LNG, LLC	Ucarsol	Hackberry, Louisiana, U.S.A.	E.P.C.	2020
FLNG Liquefaction 3, LLC	aMDEA	Freeport, Texas, U.S.A.	E.P.C.	2020
FLNG Liquefaction, LLC / FLNG Liquefaction 2, LLC (Operator)	aMDEA	Freeport, Texas, U.S.A.	E.P.C.	2020
Golden Pass LNG	Ucarsol	Sabine Pass, Texas, U.S.A.	E.P.C.	(Undisclosable)
Nigeria LNG Ltd.		Bonny Is., Nigeria	E.P.	(Undisclosable)
Qatar Petroleum	aMDEA	Ras Laffan, Qatar	E.P.C.	(Undisclosable)
QatarEnergy-North Field East (NFE) Project Onshore LNG Facilities	BASF	Ras Laffan, Qatar	E.P.C.	(Undisclosable)

## 1-7.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
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 Liquefied Gas Co., Ltd. (II) (QATARGAS II) (Train 4) (Train 5)	600	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
ExxonMobil Barzan Limited	1,940 x 2	Ras Laffan, Qatar	FEED	2010
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
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
Qatar Petroleum	700	Ras Laffan, Qatar	E.P.C.	(Undisclosable)

## 1-8.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
Chugoku Electric Power Co., Inc.	80,000 x 1	Tank & Vaporization (expansion)	Yanai, Japan	P.C.	1991
Tokyo Gas Co., Ltd.	for 130,000 kl Ship	Unloading Facility (expansion)	Negishi, Japan	B.E.P.C.	1991
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 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
Tokyo Electric Power Co., Inc.	540T/H	Gas Blower for Conduit Pipe	Futtsu, Japan	B.E.P.C.	1996
Chugoku Electric Power Co., Inc.	80,000 x 2	Tank/Vaporizer (expansion)	Yanai, Japan	P.C.	1996
Nippon Gas Co., Ltd.	36,000 x 1	Receiving Terminal	Kagoshima, Japan	E.P.C.	1996
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	—	Storage & Loading Facilities	Ras Laffan, Qatar	E.P.C.	1996
Tokyo Gas Co., Ltd.	200,000 x 1	Tank (expansion)	Negishi, Japan	B.E.P.C.	1996
Sendai City Gas Bureau	80,000 x 1	Receiving Terminal	Sendai, Japan	B.E.P.C.	1997
Tokyo Electric Power Co., Inc.	810 T/H	Vaporizer (expansion)	Higashi Ohgishima, Japan	B.E.P.C.	1997
BG plc.	—	Receiving Terminal	Pipavav, Gujarat, India	FEED	1998

Nihonkai LNG Co., Ltd.	200,000 x 1	Tank (expansion)	Niigata, Japan	P.C.	1998
PERTAMINA	—	Storage & 3rd Loading Facilities	Bontang, Indonesia	E.P.C.	1998
Qatar Liquefied Gas Co., Ltd. (QATARGAS)	—	Storage Facilities	Ras Laffan, Qatar	E.P.C.	1998
Tokyo Gas Co., Ltd.	200,000 x 1	Unloading Facility	Ohgishima, Japan	B.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 Gas Co., Ltd.	200,000 x 1	Expansion	Ohgishima, Japan	B.E.P.C.	2000
Tokyo Electric Power Co., Inc.	—	Control System (Replacement for CRT Operation)	Futtsu, Japan	B.E.P.C.	2000
Tokyo Electric Power Co., Inc.	540 T/H	Vaporizer (expansion)	Futtsu, Japan	E.P.C.	2001
Tokyo Electric Power Co., Inc.	—	Training Simulator (replacement)	Shinagawa, Japan	B.E.P.C.	2001
Toho Gas Co., Ltd.	200,000 x 1	Receiving Terminal	Midirihama, 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.	—	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
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
Mizushima LNG Co., Ltd.	10t/h	Re-liquefaction Facility	Mizushima, Japan	E.P.C.	2020
Mizushima LNG Co., Ltd.	—	Control System (Modification)	Mizushima, Japan	E.P.C.	(2026)
Nigeria LNG Ltd.	—	New Jetty for Train7	Bonny Is., Nigeria	E.P.	(Undisclosable)
<b>【LNG Related Plant at Terminal】</b>					
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

## 1-9.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
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
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
General Gas Co., Ltd.	80,000	Receiving Terminal	Sakai, Japan	P.C.	1969
Idemitsu Kosan Co., Ltd.	60,000	Receiving Terminal	Aichi, Japan	B.E.P.C.	1969
Kharg Chemical Co., Ltd.	—	Storage & Loading Facilities	Kharg Is., Iran	E.P.C.	1969
Toa Nenryo Kogyo K.K.	20,000	Receiving Terminal	Kawasaki, Japan	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
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
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
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
Qatar General Petroleum Corp. (QGPC)	—	Storage & Loading Facilities	Umm Said, Qatar	E.P.C.	1980
Tokyo Electric Power Co., Inc.	102,000	Expansion	Anegasaki, Japan	B.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
Namikata Terminal Co., Ltd.	180,000	Receiving Terminal (Incl. Chemicals)	Ehime, Japan	B.E.P.C.	1983
Tohoku Oil Co., Ltd.	90,000	Expansion	Sendai, Japan	B.E.P.C.	1983
Zen-nho Fuel Terminal Corp.	130,000	Receiving Terminal	Sakaide, Japan	B.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
Continental Grain Co./Shanghai Petrochemical Co., Ltd.	100,000	Receiving Terminal	Shanghai, China	FEED	1994
Kashima LPG Joint Stockpiling Co., Ltd.	225,000	Storage Terminal	Kashima, Japan	B.E.P.C.	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
Malaysian Refining Co., Sdn. Bhd.	—	Storage Facilities	Melaka, Malaysia	E.P.C.	1998
PERTAMINA	—	Storage & 3rd Loading Facilities	Bontang, Indonesia	E.P.C.	1998
Tokyo Gas Co., Ltd.	35,000	Receiving Terminal	Ohgishima, Japan	E.P.C.	1998
BP Ningbo Huadong LPG Co., Ltd.	—	Receiving Terminal (Water Sealed Mined Cavern Storage)	Ningbo, China	E.P.C.	2002
ExxonMobil Middle East Gas Marketing Ltd.	—	Storage & Loading Facilities	Ras Laffan, Qatar	E.P.C.	2005
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
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

## 1-10.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.	2021
PT PERTAMINA (Persero)	CO <sub>2</sub> Transportation & Storage	Undisclosable	Tanjung Enim, Indonesia	Feasibility Study	2023
Qatar Petroleum	Large Scale Carbon Capture Facility	Undisclosable	Ras Laffan, Qatar	E.P.C.	(Undisclosable)



## **2. Petroleum Refineries**

### **Scope of Work**

B: Basic Design/FEED

E: Engineering

P: Procurement

PS: Procurement Service

C: Construction

CS: Construction Supervision

M: Start-up and Commissioning

T: Training

### **Remarks**

Re: Revamping

Ex: Expansion

## 2-1. 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
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
Asia Oil Co., Ltd.	10,000	Yokohama, Japan	B.E.P.C.	1957
Asia Oil Co., Ltd.	50,000	Yokohama, Japan	B.E.P.C.	1961
Mitsubishi Oil Co., Ltd.	22,500	Mizushima, Japan	B.E.P.C.	1961
Mitsubishi Oil Co., Ltd.	3,500	Kawasaki, Japan	B.E.P.C.	1962
Maruzen Oil Co., Ltd.	50,000	Chiba, Japan	B.E.P.C.	1962
Showa Sekiyu K.K.	40,000	Niigata, Japan	E.P.C.	1963
Nippon Petroleum Refining Co., Ltd.	110,000	Negishi, Japan	B.E.P.C.	1964
Toho Oil Co., Ltd.	40,000	Owase, Japan	B.E.P.C.M.	1964
General Sekiyu Seisei K.K.	60,000	Sakai, Japan	E.P.C.	1965
Mobil Refining Co. (Malaysia) Ltd. / Fluor Corp.	25,000	Jurong, Singapore	B.E.P.	1965
Showa Yokkaichi Sekiyu Co., Ltd.	105,000	Yokkaichi, Japan	B.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
Fuji Oil Co., Ltd.	70,000	Sodegaura, Japan	B.E.P.C.	1968
Summit Industrial Corp.	20,000	Bangchack, Thailand	B.E.P.CS.	1968
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
Nippon Mining Co., Ltd.	70,000	Mizushima, Japan	B.	1969
Nippon Petroleum Refining Co., Ltd.	55,000 x 2	Negishi, Japan	B.E.P.C.	1969
Showa Sekiyu K.K.	100,000	Kawasaki, Japan	B.E.P.C.	1969
Esso Singapore Private Ltd.	80,000	Pulau Ayer, Chawan Is., Singapore	E.P.C.	1970
Esso Standard Okinawa K.K.	78,000	Nishibaru, Japan	E.P.C.	1970
Fuji Oil Co., Ltd.	70,000	Sodegaura, Japan	B.E.P.C.	1970
General Sekiyu K.K.	60,000	Sakai, Japan	E.P.C.	1970
Jordan Petroleum Refinery Co., Ltd.	8,000	Zarqa, Jordan	E.P.C.M.	1970
Seibu Oil Co., Ltd.	50,000	Yamaguchi, Japan	B.E.P.C.	1970
Chinese Petroleum Corp.	100,000	Kaohsiung, Taiwan	B.E.P.M.	1971
Kashima Oil Co., Ltd.	120,000	Kashima, Japan	B.E.P.C.	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
Fuji Kosan Co., Ltd.	50,000	Kainan, Japan	B.E.P.C.M.	1972
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
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
Corporación Estatal Petrolera Ecuatoriana	55,000	Esmeraldas, Ecuador	E.P.C.	1976
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
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
General Petroleum & Mineral Organization (PETROMIN)	170,000	Yanbu, Saudi Arabia	E.P.C.	1983
State Organization for Oil Projects (SCOP)	150,000	Baiji, Iraq	B.E.P.C.M.T.	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
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
The New Zealand Refining Co., Ltd.	38,000 Re. 56,000 (from 78,000)	Whangarei, New Zealand	B.E.P.C.CS.M.	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
Shell Eastern Petroleum Pte. Ltd. (SEPL)	Re. —	Bukom, Singapore	E.P.C.	1993
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
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) *Partially Renovating Shell Plates of Tower by C-Phoenix Method	Yamaguchi, Japan	B.E.P.C.	2012
Fuji Oil Co., Ltd.	Re. 143,000 (Partial renewal)	Sodegaura, Japan	E.P.C.	2013

## 2-2.Vacuum Flasher/Vacuum Distillation Units

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
Mitsubishi Oil Co., Ltd.	*3,500	Kawasaki, Japan	B.E.P.C.	1962
Nippon Petroleum Refining Co., Ltd.	15,000	Yokohama, Japan	C.	1962
General Petroleum & Mineral Organization (PETROMIN)	4,200	Jeddah, Saudi Arabia	E.P.C.	1967
Mitsubishi Oil Co., Ltd.	*17,000	Mizushima, Japan	B.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
General Sekiyu K.K.	53,000	Sakai, Japan	E.P.C.	1970
Seibu Oil Co., Ltd.	10,000	Yamaguchi, Japan	B.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 Mining Co., Ltd.	*27,000	Mizushima, Japan	B.E.P.C.	1973
Nippon Petroleum Refining Co., Ltd.	35,000	Negishi, 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
Corporación Estatal Petrolera Ecuatoriana	26,600	Esmeraldas, Ecuador	E.P.C.	1976
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
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
Alexandria Petroleum Co.	*23,200	Alexandria, Egypt	E.P.C.	1982
Mobil Oil Singapore Pte. Ltd.	75,000	Jurong, Singapore	B.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
Seibu Oil Co., Ltd.	40,000	Yamaguchi, Japan	B.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.C.S.M.	1986
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
Nihonkai Oil Co., Ltd.	10,000	Toyama, Japan	B.E.P.C.	1989
Thai Oil Co., Ltd.	33,200	Sriracha, Thailand	E.P.C.M.	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. (LUBEREF)	*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

\*Vacuum Distillation for Lubricating Oil

## 2-3.Catalytic Reforming Units

(for Aromatics please see page [3-4.Aromatics])

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
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
<b>【Rheniforming】</b>				
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

<b>【Powerforming】</b>				
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
<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

\*CCR: Continuous Catalyst Regeneration

## 2-4. 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.

## 2-5.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
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



<b>【Kerosene】</b>				
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 Refinery 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
<b>【Gas Oil】</b>				
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
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	13000 (from 11,000)	Mizushima, Japan	E.P.C.	2013

<b>【Deep Desulfurization Units (Gas Oil)】</b>					
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	
<b>【Ultra Deep Desulfurization Units (Gas Oil)】</b>					
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	
<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	

## 2-6.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
General Sekiyu K.K.	31,000	Sakai, Japan	E.P.C.	1970
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
Koa Oil Co., Ltd.	12,000	Osaka, Japan	B.E.P.C.	1971
Kansai Oil Co., Ltd.	20,000	Sakai, Japan	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

## 2-7.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.	( - )

## 2-8.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
Daikyo Oil Co.Re.	24,000 (from 20,000) (for VGO+Residue Oil)	Yokkaichi, Japan	B.E.P.C.	1985
Showa Yokkaichi Sekiyu Co., Ltd.	Re. 25,000 (from 17,200) (for VGO)	Yokkaichi, Japan	B.E.P.C.	1985
Seibu Oil Co., Ltd.	20,000 (for VGO)	Yamaguchi, Japan	B.E.P.C.	1986
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
Toa Oil Co., Ltd.	30,000 (for VGO)	Kawasaki, Japan	E.P.C.T.	1987
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
Tohoku Oil Co., Ltd.	25,000 (for Residue Oil)	Sendai, Japan	E.P.C.	1992
Shell Eastern Petroleum Pte. Ltd. (SEPL)	Re. —	Pulau Bukom, Singapore	E.P.C.	1992
Shell Eastern Petroleum Pte. Ltd. (SEPL)	Re. 34,300 (from 28,200) (for Residue Oil)	Pulau Ular, Singapore	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
Showa Yokkaichi Sekiyu Co., Ltd.	55,000 (for Residue Oil)	Yokkaichi, Japan	B.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
Idemitsu Kosan Co., Ltd.	45,000 (Partial Renewal)	Chiba, Japan	E.P.C.	2021

## 2-9.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
Mitsubishi Oil Co., Ltd.	45,000	Mizushima, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	40,000	Hyogo, 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
Chinese Petroleum Corp.	30,000	Kaohsiung, Taiwan	E.P.C.CS.M.	1992
Idemitsu Kosan Co., Ltd.	50,000	Chita, Japan	B.E.P.C.M.	1992
Yukong Ltd.	30,000	Ulsan, Korea	B.E.PS.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
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
<b>【OCR-Onstream Catalyst Replacement*】</b>				
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.

## 2-10.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

## 2-11. 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



## 2-12.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
JXTG Nippon Oil & Energy Corporation	Re. 10,000 (from 6,000)	Oita, Japan	E.P.C.	2019

## 2-13.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
<b>【Naphtha/Gasoline】</b>				
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
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.P.S.C.S.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

## 2-14. 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

## 2-15.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 <sup>*1</sup>	Yokkaichi, Japan	E.P.C.	1984
Seibu Oil Co., Ltd.	5,100 <sup>*2</sup>	Yamaguchi, Japan	E.P.C.	1990
Showa Yokkaichi Sekiyu Co., Ltd.	10,000 <sup>*3</sup>	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.

Note \*2: Modification of Platformer to Hysomer.

Note \*3: Revamping Hysomer by adding Isosiv.

## 2-16. 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

## 2-17. Hydrogen Manufacturing Units

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.C.S.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
Esso Singapore Private Ltd.	3,800	Pulau Ayer, Chawan Is., Singapore	E.P.C.	1970
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
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
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
Okinawa Sekiyu Seisei Co., Ltd.	50,000	Okinawa, 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
Seibu Oil Co., Ltd.	50,000	Yamaguchi, Japan	E.P.C.	1976
Toa Oil Co., Ltd.	38,800	Kawasaki, Japan	B.E.P.C.M.	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
Nippon Petroleum Refining Co., Ltd.	44,700	Muroran, Japan	B.E.P.C.M.	1982
Alexandria Petroleum Co.	*1,210	Alexandria, Egypt	B.E.P.C.M.	1982
State Organization for Oil Projects (SCOP)	74,000	Baiji, Iraq	B.E.P.C.M.T	1983
Chinese Petroleum Corp.	*39,000	Tao-Yuan, Taiwan	E.P.C.S.	1985
Perwaja Trengganu Sdn. Bhd.	80,000	Trengganu, Malaysia	B.E.P.C.S.M.T.	1985
Petromin Shell Refinery Co.	122,790	Al-Jubail, Saudi Arabia	B.E.P.C.M.T.	1985
The New Zealand Refining Co., Ltd.	65,000	Whangarei, New Zealand	B.E.P.C.C.S.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.P.S.C.S.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
Malaysian Refining Co., Sdn. Bhd. (MRC)	*13,400	Melaka, Malaysia	E.P.C.M.	1998
Thai Oil Co., Ltd.	38,960	Sriracha, Thailand	E.P.C.	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

\*PSA: Pressure Swing Adsorp

## 2-18.Sulfur Recovery Units

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
Kharg Chemical Co., Ltd.	585	Kharg Is., Iran	E.P.C.	1969
Showa Sekiyu K.K.	100	Kawasaki, Japan	E.P.C.	1969
Eso Singapore Private Ltd.	20	Pulau Ayer, Chawan Is., Singapore	E.P.C.	1970
Nippon Mining Co., Ltd.	150	Mizushima, Japan	B.E.P.C.	1970
Seibu Oil Co., Ltd.	30	Yamaguchi, Japan	E.P.C.	1970
Fuji Kosan Co., Ltd.	20	Kainan, Japan	B.E.P.C.	1972
Idemitsu Kosan Co., Ltd.	30	Tomakomai, Japan	B.E.P.C.	1972
Mitsubishi Oil Co., Ltd.	150 x 2	Mizushima, Japan	E.P.C.	1972
Okinawa Sekiyu Seisei Co., Ltd.	150 x 2	Okinawa, Japan	B.E.P.C.	1972
Shell Eastern Petroleum Pte. Ltd. (SEPL)	34	Bukom, Singapore	E.P.C.	1972
Mobil Oil Singapore Pte. Ltd.	20	Jurong, Singapore	E.P.C.	1973
Nippon Mining Co., Ltd./Maruzen Oil Co., Ltd.	70	Mizushima, Japan	B.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
China National Technical Import Corp. (CNTIC) /China Petroleum Co. (SINOPEC)	262	Qilu, China	B.E.P.CS.M.T.	1982
Mobil Oil Singapore Pte. Ltd.	55 x 2	Jurong, Singapore	E.P.C.	1982
State Organization for Oil Projects (SCOP)	227	Baiji, Iraq	B.E.P.C.M.T.	1983
Idemitsu Kosan Co., Ltd.	20	Tomakomai, Japan	B.E.P.C.	1984
Petromin-Mobil Yanbu Refinery Co., Ltd.	150 x 2	Yanbu, Saudi Arabia	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
Tohoku Oil Co., Ltd.	200 x 2	Sendai, Japan	B.E.P.C.M	1996
Yukong Ltd.	100	Ulsan, Korea	E.P.C.	1996
National Iranian Oil Co. (NIOC)	130	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Thai Oil Co., Ltd.	140 x 2	Sriracha, Thailand	E.P.C.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



## 2-19.Claus Tail Gas Treating Units

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
Fuji Kosan Co., Ltd.	20	Kainan, Japan	B.E.P.C.	1972
Mitsubishi Oil Co., Ltd.	300	Mizushima, 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
Chinese Petroleum Corp.	100	Kaohsiung, Taiwan	E.P.C.	1992
Yukong Ltd.	400	Ulsan, Korea	B.E.PS.CS.M.	1992
Koa Oil Co., Ltd.	140	Marifu, Japan	B.E.P.C.M	1993
Nihonkai Oil Co., Ltd.	40	Toyama, Japan	B.E.P.C.	1993
Nippon Petroleum Refining Co., Ltd.	170	Negishi, Japan	B.E.P.C.	1993
Showa Shell Sekiyu K.K.	16	Kawasaki, Japan	B.E.P.C.	1995
Tohoku Oil Co., Ltd.	400	Sendai, Japan	B.E.P.C.M	1996
Yukong Ltd.	100	Ulsan, Korea	B.E.P.C.	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

## 2-20.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
Maruzen Oil Co., Ltd.		190,300	Chiba, Japan	E.P.C.	1969
Nippon Mining Co., Ltd.		584,800	Mizushima, Japan	E.P.C.	1969
Showa Sekiyu K.K.		123,100	Kawasaki, Japan	E.P.C.	1969
Esso Singapore Private Ltd.		120,000	Pulau Ayer, Chawan Is., Singapore	E.P.C.	1970
Esso Standard Okinawa K.K.		—	Nishibaru, Japan	E.P.C.	1970
General Sekiyu Seisei K.K.		117,900	Sakai, Japan	E.P.C.	1970
Idemitsu Kosan Co., Ltd.		6,899,000	Hyogo, Japan	E.P.C.	1970
Nippon Mining Co., Ltd.		5,156,000	Mizushima, 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
Daikyo Oil Co.		139,000	Yokkaichi, Japan	E.P.C.	1972
Okinawa Sekiyu Seisei Co., Ltd.		232,000	Okinawa, 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
Corporación Estatal Petrolera Ecuatoriana		250,000	Esmeraldas, Ecuador	E.P.C.	1976
Eureka Chemical Industry Co., Ltd.		131,000	Sodegaura, Japan	E.P.C.	1976
Fuji Oil Co., Ltd.		3,148,000	Sodegaura, Japan	E.P.C.	1976
Koa Oil Co., Ltd.		3,670,000	Marifu, Japan	E.P.C.	1976
Seibu Oil Co., Ltd.		5,717,000	Yamaguchi, Japan	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 LPG	2,906,800 40,000 T/Y	Riyadh, Saudi Arabia	E.P.C.	1981
General Petroleum & Mineral Organization (PETROMIN)	GAS LPG	150,000 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 LPG	164,790 248,000 T/Y	Kawasaki, Japan	E.	1987
Shell Eastern Petroleum Pte. Ltd. (SEPL)	GAS LPG	359,000 237,000 T/Y	Pulau Ular, Singapore	E.P.C.	1989
Thai Oil Co., Ltd.	GAS LPG	7,013,000 23,000 T/Y	Sriracha, Thailand	E.P.C.	1989
Chinese Petroleum Corp.		3,840,000	Tao Yuan, Taiwan	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
Chinese Petroleum Corp.		4,527,200	Kaohsiung, Taiwan	E.P.C.	1992
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
Koa Oil Co., Ltd.	GAS LPG	3,281,000 492,000 T/Y	Marifu, Japan	E.P.C.	1993
Nihonkai Oil Co., Ltd.		1,070,600	Toyama, Japan	E.P.C.	1993
Nippon Petroleum Refining Co., Ltd.		414,000	Negishi, Japan	E.P.C.	1993
Thai Oil Co., Ltd.	GAS LPG	68,000 87,300 T/Y	Sriracha, Thailand	E.P.C.	1993
Showa Yokkaichi Sekiyu Co., Ltd.	GAS LPG	655,800 197,000 T/Y	Yokkaichi, Japan	E.P.C.M.	1996
Tohoku Oil Co., Ltd.		9,049,800	Sendai, Japan	E.P.C.M.	1996
National Iranian Oil Co. (NIOC)	GAS LPG	730,000 267,000 T/Y	Bandar Abbas, Iran	B.E.P.CS.M.	1997
Thai Oil Co., Ltd.	GAS LPG	416,000 44,000 T/Y	Sriracha, Thailand	E.P.C.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.		Undisclosable	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

## 2-21.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
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
Fuji Oil Co., Ltd.	38.8	Sodegaura, Japan	B.E.P.C.	1968
Nippon Petroleum Refining Co., Ltd.	81.3	Negishi, Japan	B.E.P.C.	1968
Seibu Oil Co., Ltd.	33.1	Yamaguchi, Japan	B.E.P.C.	1968
Toa Oil Co., Ltd.	35.1	Kawasaki, Japan	B.E.P.C.	1968
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
Showa Sekiyu K.K.	30.5	Kawasaki, Japan	B.E.P.C.	1969
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
Koa Oil Co., Ltd.	23.7	Marifu, Japan	B.E.P.C.	1970
Koa Oil Co., Ltd.	59.0	Osaka, Japan	B.E.P.C.	1971
Chinese Petroleum Corp.	33.0	Kaohsiung, Taiwan	B.E.P.C.	1971
Kashima Oil Co., Ltd.	28.6	Kashima, 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
Idemitsu Kosan Co., Ltd.	33.0	Tomakomai, Japan	B.E.P.C.	1972
Kyushu Oil Co., Ltd.	86.0	Ohita, 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
Mitsubishi Oil Co., Ltd.	67.0	Mizushima, Japan	B.E.P.C.	1972
Mitsubishi Oil Co., Ltd.	52.6	Mizushima, Japan	B.E.P.C.	1973
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
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
Asia Kyoseki Oil Co., Ltd.	10.6	Sakaide, Japan	B.E.P.C.	1974
Idemitsu Kosan Co., Ltd.	25.0	Hyogo, Japan	B.E.P.C.	1974
Nihonkai Oil Co., Ltd.	30.0	Toyama, 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
Maruzen Oil Co., Ltd.	60.0 x 2	Chiba, Japan	B.E.	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
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
US Oil	1.9	Tacoma, U.S.A.	B.E.	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; EUREKA)	70.0	Nanjing, China	B.E.P.CS.M.T.	1988

China National Technical Import and Export Corp. (ECN-Project; HT)	7.0	Nanjing, China	B.E.P.C.S.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.P.S.C.S.M.	1992
Idemitsu Kosan Co., Ltd.	41.0	Tomakomai, Japan	B.E.P.C.	1994
Showa Yokkaichi Sekiyu Co., Ltd.	41.0	Yokkaichi, Japan	E.P.C.M.	1996
Tohoku Oil Co., Ltd.	60.0	Sendai, Japan	B.E.P.C.M.	1996
Yukong Ltd.	50.0	Ulsan, Korea	E.P.C.	1996
National Iranian Oil Co. (NIOC)	75.0 x 2	Bandar Abbas, Iran	B.E.P.C.S.M.	1997
Thai Oil Co., Ltd.	45.0	Sriracha, Thailand	E.P.C.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

## 2-22. 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
General Petroleum & Mineral Organization (PETROMIN)	53	Jeddah, Saudi Arabia	B.E.P.C.	1967
Maruzen Oil Co., Ltd.	80	Chiba, Japan	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
General Petroleum & Mineral Organization (PETROMIN)	900 BPSD	Jeddah, Saudi Arabia	E.P.C.	1974
Jeddah Oil Refinery Co.	191	Jeddah, Saudi Arabia	E.P.C.	1974
Corp.oración 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

## 2-23. 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

## 2-24.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
<b>【Propane Deasphalting Unit】</b>				
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
<b>【Solvent Extraction Unit】</b>				
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
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
<b>【Lube/Wax Hydrofinishing and Catalytic Dewaxing Units】</b>				
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



<b>【Solvent Dewaxing Unit】</b>				
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
<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
<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

### **3. Petrochemical and Chemical Plants**

#### **Scope of Work**

F: FEED/FEL (Front End Loading)

B: Basic Design

E: Engineering

P: Procurement

PS: Procurement Service

C: Construction and Start-up Assistance

CM: Construction Management

CS: Construction Supervision

S: Field Supervision

M: Start-up and Commissioning

T: Training

#### **Remarks**

Re: Revamping

Ex: Expansion

### 3-1.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
Kasei Mizushima Petrochemical Co., Ltd.	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
Gulf Coast Growth Ventures LLC	1,800,000	Gulf of Mexico, U.S.A.	F.E.P.C.	2021
<b>【Polyethylene】</b>				
<b>【Linear Low Density Polyethylene (LLDPE)】</b>				
Eastern Petrochemical Co. (SHARQ)	130,000	Al-Jubail, Saudi Arabia	E.P.C.	1985
Samsung General Chemicals Co., Ltd.	80,000	Daesan, Korea	E.	1993
<b>【High Density Polyethylene (HDPE)】</b>				
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
<b>【Ethylene Oxide】</b>				
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
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
<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
<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.P.S.	1972
V/O Techmashimport	60,000	Volgograd, U.S.S.R.	B.E.P.S.	1973
China National Technical Import and Export Corp. (CNTIC)	15,000	Fuzhou, China	B.E.P.C.S.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.	10,000	Nantong, China	E.P.C.	2005
Kureha Corporation	30,000	Iwaki, Japan	E.P.C.	2014
Kureha Corporation	8,000	Iwaki, Japan	B.E.P.C.	(2026)
<b>【Poly-Vinylidene Fluoride (PVDF)】</b>				
Kureha Corporation	2,000	Iwaki, Japan	E.P.C.	2018
<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
<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
<b>【<math>\alpha</math>-Olefin】</b>				
Idemitsu Petrochemical Co, Ltd.	50,000	Chiba, Japan	F.	1987
<b>【<math>\alpha</math>-Olefin Oligomer】</b>				
Lion Fat & Oil Co., Ltd.	180	Kawasaki, Japan	E.P.C.	1973
Lion Fat & Oil Co., Ltd.	400	Kawasaki, Japan	E.P.C.	1976

\* Cracker Design and Fabrication

## 3-2. 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.P.S.CS.	1992
<b>【Polypropylene】</b>					
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
<b>【Propylene Oxide】</b>					
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
<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
<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: Chiyoda (Thailand) Limited.

### 3-3.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	Undisclosable	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
<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
<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>【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

### 3-4.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
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
<b>【Benzene (Hydrodealkylation)】</b>				
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
<b>【Ethylbenzene (EB)】</b>				
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
<b>【Styrene Monomer (SM)】</b>					
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
<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
Nitrocarbone S.A.		85	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
Nitrocarbone 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
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

<b>【Epoxy Resins】</b>					
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
<b>【Alkyl Phenol】</b>					
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
<b>【Maleic Anhydride】</b>					
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
<b>【Tetrahydrofuran (THF)】</b>					
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
<b>【γ-Butyrolactone (GBL)】</b>					
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
<b>【Linear Alkyl Benzene (LAB)】</b>					
Mitsubishi Petrochemical Co., Ltd.		Ex. 25,000	Yokkaichi, Japan	E.P.C.	1970
<b>【Synthetic Detergent】</b>					
Lion Fat & Oil Co., Ltd.		40,000	Kokura, Japan	E.P.C.	1961
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
<b>【Methylene Dianiline/Diphenylmethane Diisocyanate (MDA/MDI)】</b>					
Undisclosable	MDA/MDI	Unannounced	Undisclosable	F.	2001
Sumika Bayer Urethane Co., Ltd.	MDA/MDI	Ex. 20,000	Niihama, Japan	E.P.C.	2002
<b>【Toluene Diamine/Toluene Diisocyanate (TDA/TDI)】</b>					
Undisclosable	TDA/TDI	Unannounced	Undisclosable	F.	2001
<b>【Phenol】</b>					
Nippon Steel Chemical Co., Ltd.		120,000	Tobata, Japan	B.E.P.C.	1991
Undisclosable		27,000	Undisclosable	F.	1999
<b>【Benzoate Group】</b>					
Undisclosable	Benzoic Acid	4,500	Undisclosable	F.	1999
Undisclosable	Sodium Benzoate	4,500	Undisclosable	F.	1999
Undisclosable	Benzoaldehyde	5,400	Undisclosable	F.	1999
<b>【Xylene Disproportionation】</b>					
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
<b>【Ethylbenzene Separation】</b>					
Mitsubishi Gas Chemical Co., Ltd.		55,000	Mizushima, Japan	B.E.P.C.	1972
<b>【Xylene Isomerization】</b>					
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
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
<b>【Para-Xylene Separation】</b>					
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
<b>【Meta-Xylene Separation】</b>					
Mitsubishi Gas Chemical Co., Inc.		70,000	Mizushima, Japan	E.P.C.	2009
<b>【Terephthalic Acid】</b>					
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
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
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
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

<b>【Dimethyl Terephthalate (DMT)】</b>					
Mitsubishi Chemical Industries, Ltd.	6,000	Kurosaki, Japan	E.P.C.	1964	
Kawasaki Chemicals, Ltd.	5,400	Kawasaki, Japan	B.E.P.C.	1965	
<b>【Ortho-Xylene Separation】</b>					
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	
<b>【Phthalic Anhydride】</b>					
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	
<b>【Meta-Xylene】</b>					
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	
<b>【Mix-Xylene Separation Process】</b>					
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	
Idemitsu Kosan Co., Ltd.	170,000 (Production Volume of Mix Xylene)	Aichi, Japan	B.E.P.C.	2018	
<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>【Benzaldehydes】</b>					
Mitsubishi Gas Chemical Co., Inc.	—	Mizushima, Japan	B.E.P.C.	2023	
<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

CTA: Crude Telephthalic Acid

PTA: Pure Telephthalic Acid

### 3-5.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	
<b>【Fatty Nitrile/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	

### 3-6.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



### 3-7.Synthesis Gas/Fertilizers

(for Hydrogen Manufacturing Units please see page [2-17. Hydrogen Manufacturing Units])

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.MT	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/Myanmar 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 Arabian 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 KK		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
<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
<b>【DME】</b>					
JFE Holdings, Inc.		—	—	FEED	2003
<b>【CO/Oxo Gas】</b>					
Toa Nenryo Kohgyo Co., Ltd.	H <sub>2</sub> +CO	26,800 Nm <sup>3</sup> /h	Kawasaki, Japan	B.E.P.C.	1971
<b>【Phosgene】</b>					
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.		85	Jurong, Singapore	E.P.C.	2002

### 3-8.Coal Chemicals

Client	Capacity (Tons/Day)	Location	Scope of Work	Year of Completion
<b>【Coal Tar Distillation】</b>				
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
<b>【Tar Acid Extraction】</b>				
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
<b>【Naphtalene Distillation】</b>				
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
<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 Liquefacation】</b>				
Nippon Coal Oil	Pilot 150	Kashima, Japan	B.E.P.C.	1996

### 3-9. 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	
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	
<b>【Chlorine】</b>					
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	
<b>【Hydrogen Chloride】</b>					
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	
<b>【Hydrogen Chloride Recovery】</b>					
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
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
<b>【Hydrogen Peroxide】</b>					
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
<b>【Hydrazine】</b>					
Mitsubishi Gas Chemical Co. Inc.		9,000 T/Y	Yokkaichi, Japan	B.E.P.C.	1989
<b>【Polysulfide】</b>					
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
<b>【Catalyst】</b>					
Undisclosable		—	Kanagawa, Japan	E.P.C.	1993
Undisclosable		—	Toyama, Japan	E.P.C.	1998
Toho Titanium Co., Ltd.		—	Kanagawa, Japan	E.P.C.	2022
<b>【Silicon/Silane】</b>					
Undisclosable	Poly-Silicon	1,000 T/Y	Oregon, U.S.A.	F.	1986
Undisclosable	Poly-Silicon Pilot	—	Arizona, U.S.A.	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	85	Sarawak, Malaysia	E.P.C.	2014
<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 BEPS	B.E.PS.	1988

\* C: Chiyoda Sarawak Sdn. Bhd.

### 3-10.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, U.S.A.	E.P.C.	1991	
Nihon Zeon Co., Ltd	1,000	Tokuyama, Japan	E.P.C.	1995	
<b>【Photoresist】</b>					
JSR Corp.	—	California, U.S.A.	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	
<b>【Corn Syrup】</b>					
Fuji Toka Co., Ltd	—	Fuji, Japan	E.P.C.	1966	
<b>【Sorbitol】</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	

## 4. Flue Gas Desulfurization Plants

### Scope of Work

E: Engineering

P: Procurement

C: Construction

L: License

## 4-1.CT-121 FGD Plants

Client	Flue Gas Source	Capacity: More than 300MWe		Location	Scope of Work	Year of Completion
		(Nm <sup>3</sup> /h)	(MWe)			
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-ohata, 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	Nanaoohata, 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
Shanxi Hexin Power Development Co., Ltd.	Boiler, Coal	2,221,000	600	Wuxiang, Shanxi, 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.	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	JM Stuart, OH, USA	E.L.	2008
Dayton Power & Light Co.	Boiler, Coal	2,661,000	610	JM Stuart, OH, USA	E.L.	2008
Dayton Power & Light Co.	Boiler, Coal	2,661,000	610	JM Stuart, OH, USA	E.L.	2008
Dayton Power & Light Co.	Boiler, Coal	2,661,000	610	JM Stuart, OH, 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
PowerSouth Energy Cooperative	Boiler, Coal	1,314,000	340	Lowman, AL, 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
Beijing Deyuan Investment Co., Ltd.	Boiler, Coal	1,980,000	600	Diandong, Yunnan, China	L	2009
Gulf Power Co.	Boiler, Coal	4,348,000	984	Crist, FL, 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
Georgia Power Co.	Boiler, Coal	3,267,000	756	Bowen, GA, USA	E.L.	2010
Alabama Power Co.	Boiler, Coal	4,067,000	950	Gaston, AL, 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
Dong Energy	Boiler, Coal	1,054,000	400	Asnaes, Denmark	E.L.	2010



Kansai Electric Power Co., Inc.	Boiler, Coal	2,700,000	900	Maizuru, Japan	E.P.C.	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
Hokuriku Electric Power Company	Boiler, Coal	1,539,000	500	Nanaohta, Japan	E.P.C.	2021
Kobe Steel Ltd.	Boiler, Coal	2,066,000	650	ShinkoKobe, Japan	E.P.C.	2021
Kobe Steel Ltd.	Boiler, Coal	2,066,000	650	ShinkoKobe, Japan	E.P.C.	2022
NPL Ltd.	Boiler, Coal	2,677,000	700	Rajpura, India	E.L.	(2025)
NPL Ltd.	Boiler, Coal	2,677,000	700	Rajpura, India	E.L.	(2025)
NTPC Ltd.	Boiler, Coal	2,620,800	660	Khargone, India	E.L.	(2025)
NTPC Ltd.	Boiler, Coal	2,620,800	660	Khargone, India	E.L.	(2025)
NTPC Ltd.	Boiler, Coal	3,304,800	800	Lara, India	E.L.	(2025)
NTPC Ltd.	Boiler, Coal	3,304,800	800	Lara, India	E.L.	(2025)
NTPC Ltd.	Boiler, Coal	3,304,800	800	Darlipalli, India	E.L.	(2025)
NTPC Ltd.	Boiler, Coal	3,304,800	800	Darlipalli, India	E.L.	(2025)
SJVN Ltd.	Boiler, Coal	2,377,600	660	Buxar, India	E.L.	(2025)
SJVN Ltd.	Boiler, Coal	2,377,600	660	Buxar, India	E.L.	(2025)
Damodar Valley Corporation	Boiler, Coal	2,445,900	500	Durgapur, India	E.L.	(2026)
Damodar Valley Corporation	Boiler, Coal	2,445,900	500	Durgapur, India	E.L.	(2026)
Damodar Valley Corporation	Boiler, Coal	2,354,000	500	Mejia, India	E.L.	(2026)
Damodar Valley Corporation	Boiler, Coal	2,354,000	500	Mejia, India	E.L.	(2026)
Damodar Valley Corporation	Boiler, Coal	2,903,800	600	Raghunathpur, India	E.L.	(2026)
Damodar Valley Corporation	Boiler, Coal	2,903,800	600	Raghunathpur, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	2,217,600	500	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	3,218,400	210 x 3	Vindhyachal, India	E.L.	(2026)
NTPC Ltd.	Boiler, Coal	3,218,400	210 x 3	Vindhyachal, India	E.L.	(2026)
NLC India Ltd.	Boiler, Coal	2,491,200	500	Neyveli New, India	E.L.	(2026)
NLC India Ltd.	Boiler, Coal	2,491,200	500	Neyveli New, India	E.L.	(2026)
Neyveli Uttar Pradesh Power Ltd.	Boiler, Coal	2,314,800	660	Ghatampur, India	E.L.	(2026)
Neyveli Uttar Pradesh Power Ltd.	Boiler, Coal	2,314,800	660	Ghatampur, India	E.L.	(2026)
Neyveli Uttar Pradesh Power Ltd.	Boiler, Coal	2,314,800	660	Ghatampur, India	E.L.	(2026)
West Bengal Power Development Corporation Limited	Boiler, Coal	2,490,300	300 x 2	Sagardighi	E.L.	(2026)
West Bengal Power Development Corporation Limited	Boiler, Coal	2,078,900	500	Sagardighi	E.L.	(2026)
West Bengal Power Development Corporation Limited	Boiler, Coal	2,078,900	500	Sagardighi	E.L.	(2026)

## **5. Pharmaceutical Plants**

### **Scope of Work**

E: Engineering

P: Procurement

C: Construction

V: Validation

## 5-1.Pharmaceutical

Client	Type	Location	Scope of Work	Year of Completion
Eiken Chemical Co., Ltd.	Aseptic, Commercial	Tochigi, Japan	E.P.C.V.	1995
Nippon Boehringer Ingelheim Co., Ltd.	Finishing, Commercial	Shiga, Japan	E.	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
Fukuzyu Pharmaceuticals Co., Ltd.	API, Commercial	Toyama, Japan	E.P.C.V.	1996
Kyowa Hakko Co., Ltd.	Bio, Clinical	Yamaguchi, Japan	E.	1996
Eisai Chemical Co., Ltd.	API, Clinical	Ibaraki, Japan	E.P.C.V.	1997
Kanebo Ltd.	API, Clinical	Saitama, Japan	E.P.C.V.	1997
Pharmacia & Upjohn	Finishing, Commercial	Ibaraki, Japan	E.P.C.V.	1997
Kuraray Co., Ltd.	API, Commercial	Niigata, Japan	E.P.C.V.	1998
Japan Tissue Engineering Co., Ltd.	API, Commercial	Aichi, Japan	E.P.C.	1999
JATRON Laboratories Inc.	Finishing, Commercial	Chiba, Japan	E.P.C.V.	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
Banyu Pharmaceutical Co., Ltd.	Highly Potent API, Clinical	Aichi, Japan	E.Cm.V.	2001
Fujisawa Pharmaceuticals Co., Ltd.	Aseptic, Commercial	Toyama, Japan	E.P.C.V.	2001
Ajinomoto Pharmaceuticals Co., Ltd.	Finishing, Commercial	Fukushima, Japan	E.P.C.V.	2002
Bayer Yakuhin, Ltd.	Bio, Clinical	Shiga, Japan	E.	2002
Daiichi Yakuhin Kogyo Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C.	2002
FUJIFILM Finechemicals Co., Ltd.	API, Clinical	Fukushima, Japan	E.P.C.V.	2002
Pharmacia	Finishing, Commercial	Korea	E.Cm.V.	2002
Sumitomo Chemical Co., Ltd.	Highly Potent API, Commercial	Oita, Japan	E.	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
Air Water Inc.	API, Commercial	Ibaraki, Japan	E.P.C.V.*	2005
Mitsubishi Tanabe Pharma Factory Ltd.	Bio, Clinical	Kanagawa, Japan	E.P.C.V.*	2005
Asahi Kasei Pharma Corporation	Finishing, Commercial	Aichi, Japan	E.P.C.V.*	2006
Astellas Pharma Inc.	Finishing, Commercial	Ireland	E.	2006
Dainippon Sumitomo Pharma Co., Ltd.	Finishing, Clinical, Commercial	Osaka, 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
Becton, Dickinson and Company	Finishing, Commercial	Fukushima, Japan	E.*	2007
Janssen Pharmaceutical K.K.		Shizuoka, Japan	E.P.C.V.*	2007
Kongo Chemical Co., Ltd.	API, Commercial	Toyama, Japan	E.P.C.V.*	2007
Kongo Chemical Co., Ltd.	API, Commercial	Toyama, Japan	E.P.C.V.*	2007
Shionogi & Co., Ltd.	API, Clinical	Hyogo, 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
Eisai Co., Ltd.	API, Commercial	Ibaraki, Japan	E.P.C.V.	2008
Ajinomoto Pharmaceuticals Co., Ltd.	Finishing, Commercial	Shizuoka, Japan	E.P.C.	2008
Central Glass Co., Ltd.	API, Commercial	Yamaguchi, Japan	E.P.C.V.	2008
Fresenius Medical Care Japan K.K.	Aseptic, Commercial	Fukuoka, Japan	E.P.C.V.	2008
Kokando, Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C.*	2008
Maruho Co., Ltd.	Finishing, Commercial	Shiga, Japan	E.P.C.V.*	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
Nippon Shinyaku Co., Ltd.	Finishing, Commercial	Kanagawa, Japan	E.P.C.V.	2008
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.	2009
Eisai Co., Ltd.	Finishing, Commercial	Saitama, Japan	V.	2009
Maruho Co., Ltd.	Finishing, Commercial	Shiga, Japan	E.P.C.V.*	2009
Nihon Generic Co., Ltd.	Finishing, Commercial	Ibaraki, Japan	E.P.C.*	2009
Wakamoto Pharmaceutical Co., Ltd.	Finishing, Commercial	Kanagawa, Japan	E.P.C.	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
Nichi-Iko Pharmaceutical Co., Ltd.	Finishing, Commercial	Toyama, 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
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
The Research Foundation for Microbial Diseases of Osaka University	Finishing, Commercial	Kagawa, 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
CMIC CMO Co., Ltd.	Finishing, Commercial	Tochigi, Japan	E.P.C.V.	2018
CMIC JSR Biologics Co., Ltd.	Bio, API	Shizuoka, Japan	E.P.C.V.	2018
Nichi-Iko Pharmaceutical Co., Ltd.	Finishing, Commercial	Toyama, Japan	E.P.C.V.*	2018
Tosoh Corporation	Officers	Yamaguchi, Japan	E.P.C.	2018
Nippon Shokubai Co., Ltd.	API, Commercial	Osaka, Japan	E.P.C.V.*	2019
PeptiStar Inc.	API, Commercial	Osaka, Japan	E.P.C.V.	2019
Shionogi & Co., Ltd.	Bio, API, Commercial	Gifu, Japan	E.P.C.V.	2022
AGC Inc.	Bio, API, Commercial	Kanagawa, Japan	E.P.C.V.	(Undisclosable)

\* Main Contractor: Chiyoda Techno Ace Co., Ltd.

## **6. Green Device, Non-Ferrous Metal Plants and Transportation**

### **Scope of Work**

FEED: Front End Engineering Design

E: Engineering

M: Start-up and Commissioning

P: Procurement

C: Construction

## 6-1.Green Device

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Undisclosable	Flexible Printed Circuit Plant	—	Fukuoka, Japan	E.P.C.	2005
Undisclosable	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
Undisclosable	Ceramic Fiber Plant	—	Japan	E.P.C.	2016
Undisclosable	Precious Metal Recycle Plant	—	Chiba, Japan	E.P.C.	2018
Undisclosable	Precious Metal Recycle Plant	—	Chiba, Japan	E.P.C.	2021
Undisclosable	Local Rlectrical Grid System	—	Undisclosable, Japan	FS, E.P.C.	2023

## 6-2.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
PT Freeport Indonesia	Copper Cathode Plant	--	Gresik, Indonesia	E.P.C.	2024

### 6-3. Transportation Project

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Civil Aviation Authority of Mongolia	Airport	—	Ulaanbaatar, Mongolia	P.C.	2017
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



## **7. New Energy**

### **Scope of Work**

FEED: Front End Engineering Design

B: Basic Design

E: Engineering

M: Start-up and Commissioning

P: Procurement

C: Construction

O&M: Operation & Maintenance

## 7-1. 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
AIKAWA PRESS INDUSTRY CO., LTD.	CIS Photovoltaic Power Plant (On Ground)	1,800kW	Yamanashi, Japan	E.P.C.	2013
INPEX CORPORATION	CIS Photovoltaic Power Plant (On Ground)	2,300kW	Niigata, Japan	E.P.C.	2013
OR Solar Co, Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,500kW	Toyama, 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
SHOWA SHELL SEKIYU K.K.	CIS Photovoltaic Power Plant (Rooftop)	2,400kW	Miyazaki, 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
MITSUI & Co, Ltd.	CIS Photovoltaic Power Plant (On Ground)	19,600kW	Aichi, Japan	E.P.C.	2014
Sanco Real Estate Co, Ltd.	CIS Photovoltaic Power Plant (On Ground)	2,400kW	Mie, Japan	E.P.C.	2014
Seibu Oil Company Co, Ltd.	CIS Photovoltaic Power Plant (On Ground)	10,400kW	Yamaguchi, 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
INPEX LOGISTICS (JAPAN) CO., LTD.	CIS Photovoltaic Power Plant (On Ground)	2,500kW	Niigata, 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
Sanco Real Estate Co, Ltd.	CIS Photovoltaic Power Plant (On Ground)	15,500kW	Mie, Japan	E.P.C.	2015
LM Sun Power Co, Ltd.	CIS Photovoltaic Power Plant (On Ground)	8,800kW	Miyagi, Japan	E.P.C.	2015
LM Sun Power Co, Ltd.	CIS Photovoltaic Power Plant (On Ground)	8,200kW	Fukushima, Japan	E.P.C.	2016
Nagasaki Solar Energy Godo Kaisha	CIS Photovoltaic Power Plant (On Ground)	29,700kW	Nagasaki, Japan	E.P.C.	2016
Niigata Shimami Solar Park LLC.	CIS Photovoltaic Power Plant (On Ground)	14,200kW	Niigata, 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
SDT Solar Power K.K.	CIS Photovoltaic Power Plant (On Ground)	17,300kW	Yamaguchi, Japan	E.P.C.	2017
Solar Frontier K.K.	CIS Photovoltaic Power Plant (On Ground)	13,000kW	Iwate, Japan	E.P.C.	2017
Ube Nishioki Solar Energy LLC	CIS Photovoltaic Power Plant (On Ground)	18,500kW	Yamaguchi, Japan	E.P.C.	2019
GK JRE Takashima	Photovoltaic Power Plant (On Ground)	13,200kW	Shiga, Japan	E.P.C.	2020
Pacifico Energy Toyota LLC	Photovoltaic Power Plant (On Ground)	62,000kW	Aichi, Japan	E.P.C.	2020
FS Japan Project 18 G.K.	Photovoltaic Power Plant (On Ground)	16,800kW	Ibaraki, Japan	E.P.C.	2021
FS Japan Project 6 G.K.	Photovoltaic Power Plant (On Ground)	60,500kW	Kyoto&Mie, Japan	E.P.C.	2023

## 7-2.Biomass Firing Power Plant

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Sodegaura Biomass Power Co., Ltd.	Biomass Firing Power Plant	75MW	Chiba, Japan	E.P.C.M.	(2025)

### 7-3. Battery and Decentralized Energy System

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
North Hokkaido Wind Energy Transmission Corporation	Battery Energy Storage System	720MWh	Hokkaido, Japan	E.P.C.	2023
ENEOS Power Corporation	Battery Energy Storage System	88MWh	Hokkaido, Japan	E.P.C.	2024
ENEOS Power Corporation	Battery Energy Storage System	202MWh	Chiba, Japan	E.P.C.	(2025)
Nijio Co.,Ltd	Battery Energy Storage System	50MWh	Oita, Japan	E.P.C.	(2027)
North Hokkaido Wind Energy Transmission Corporation	Battery Energy Storage System	720MWh	Hokkaido, Japan	O&M	(2043)

## 7-4. Biofuel Plant

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
euglena Co., Ltd.	Biojet and diesel fuel production demonstration plant	125Kl/year	Kanagawa, Japan	B.E.P.C.	2018

## 7-5.Power to Liquid/Gas

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
<b>【Power to Liquid】</b>					
New Energy and Industrial Technology Development Organization (NEDO)	E-jet fuel production plant	undisclosable	U.A.E	Feasibility Study	2023
ENEOS Corporation	MCH Production Plant	30Nm <sup>3</sup> /h	Australia	B.E.P.C.	2023
ENEOS Corporation	Direct MCH <sup>®</sup> dehydrogenation demonstration plant	30Nm <sup>3</sup> /h	Kanagawa, Japan	B.E.P.C.	2023
ENEOS Corporation	Synthetic fuel Production test plant	1B/D(1 Barrel per Day)	Kanagawa, Japan	E.P.C.	2024
Japan Suiso Energy	Liquefied Hydrogen Plant	120ton/day	Australia	B	(Undisclosable)
<b>【Power to Gas】</b>					
INPEX CORPORATION	CO <sub>2</sub> -methanation test facilities	400Nm <sup>3</sup> -CO <sub>2</sub> /h	Niigata, Japan	E.P.C.	(2026)

## 7-6.Offshore Wind Farm

Client	Type of Plant	Capacity	Location	Scope of Work	Year of Completion
Undisclosed	Offshore Wind (Bottom-fixed type)	undisclosed	Japan	Pre-FEED	2021
Undisclosed	Offshore Wind (Bottom-fixed type)	undisclosed	Japan	Pre-FEED/ Auction Support	2023
Undisclosed	Offshore Wind (Bottom-fixed type)	undisclosed	Japan	Auction Support	2023
Undisclosed	Offshore Wind (Bottom-fixed type)	undisclosed	Japan	Pre-FEED/ Auction Support	2024
Undisclosed	Offshore Wind (Bottom-fixed type)	undisclosed	Japan	Feasibility Study	2024
Undisclosed	Offshore Wind (Floating type)	undisclosed	Japan	Feasibility Study	2024

## **8. Others**

### **Scope of Work**

E: Engineering

P: Procurement

C: Construction and Start-up Assistance



## 8.Others

Client	Capacity (Tons/Year)	Location	Scope of Work	Year of Completion
【 Food Factory 】				
SUGIYO Co.,Ltd.	—	Ishikawa, Japan	E.P.C.	2024



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