

## **Act on Sophisticated Methods of Energy Supply Structures**

An act to promote the use of non-fossil resources and more effective use of fossil sources by energy supply businesses.

It facilitates measures necessary to promote the use of renewable energy sources such as sunlight and wind, non-fossil resources including nuclear energy, and more effective use of fossil resources by energy supply businesses including electric, gas, and oil companies.

(Source: Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry)

## **ALA**

5-aminolaevulinic acids (ALA)

ALA is a natural and important amino acid and it has an important role as a raw material used for the production of haem in the blood and chlorophyll in the plant body. It is used as an enhancer of fertilizer to promote plant growth. It is also used in photodynamic cancer therapy, and is expected to be applied in the sectors of pharmaceuticals for both humans and animals and animal feed in areas, such as prevention of anemia in pigs and improvement of disease resistance in fish. The market for ALA is highly expected to grow into a huge one that can be equal to the size of the markets for main amino acids in the future. Cosmo Oil has developed a low-cost method of manufacturing ALA, which is supplied to the fertilizer, animal feed, cosmetics, health food, pharmaceutical, and other markets. At the same time, Cosmo Oil is working with partners on the development and sales of new applications for these markets.

## **API**

The American Petroleum Institute gravity, or API gravity is a measure of the density of a crude oil liquid. If its API gravity value is greater, it indicates that a larger quantity of lighter and more highly value-added distillate products (gasoline, kerosene, jet fuel and diesel fuel) is likely to be distilled from the liquid, which is priced higher in the market.

## Arakawa Chemical Industries, Ltd.

-Founded in 1876, the company manufactures and sells environmentally friendly, value added materials, including those necessary for manufacturing products related to printing and cutting-edge electronics, based on its core technologies in the chemistry of rosin or pine resin.

-Stared discuss joint business with Cosmo Oil Co., Ltd. and Maruzen Petrochemical Co., Ltd. in May 2016.

### 《Overview》

(1) Founded	1876
(2) Incorporated	1931
(3) Capital	¥3,293.72 million
(4) Business	Manufacture and sale of paper chemicals, resin materials for printing inks and adhesives and intermediate materials for electronic components
(5)URL	<a href="http://www.arakawachem.co.jp/en/">http://www.arakawachem.co.jp/en/</a>

## Biogasoline

Biofuels, made from plants as raw materials, are eco-friendly fuels since they don't increase CO<sub>2</sub> in the atmosphere, even if they release CO<sub>2</sub> through incineration since plants have already absorbed CO<sub>2</sub> through photosynthesis in the growing process, which is called the "carbon neutral effect".

In 2010, the oil industry in Japan has decided to introduce 840,000 kl of ether tertiary butyl ether, or ETBE, which is a fuel produced by mixing ethanol and isobutylene.

## **Car Care Merchandise**

It includes car inspection, repair, lubricating oil change, and car wash services, tires, batteries, accessories, and other automotive products and services, which represent the value added merchandise.

## **CEPSA**

Compañía Española de Petróleos, S.A.U. (Director and Chief Executive Officer: Pedro Miró Roig; hereinafter “CEPSA”), Spanish integrated oil company.

In January 2014, Cosmo Oil CO.,Ltd and CEPSA have agreed and signed a Memorandum of Agreement in relation to Strategic Comprehensive Cooperation.

In November 2014, CEPSA has joined Cosmo Oil's upstream subsidiary, “Cosmo Abu Dhabi Energy Exploration & Production Co., Ltd”

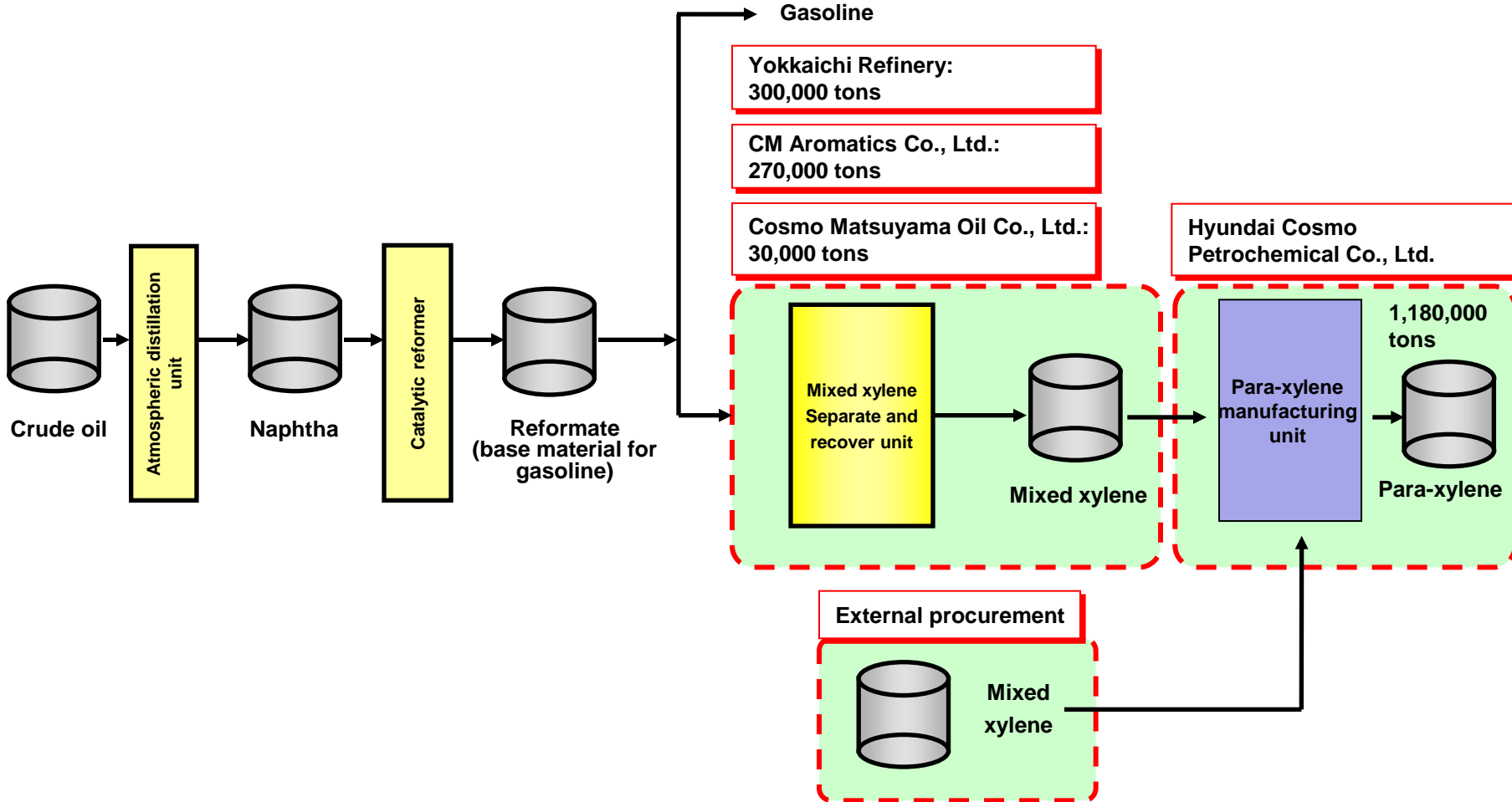
# CM Aromatics Co., Ltd.

A joint venture company established by Cosmo Oil and Maruzen Petrochemical Co., Ltd. to procure the base material to manufacture mixed xylene and to store and market it.

Date of establishment: April 1, 2005

Capital: ¥100 million

Invested by: Cosmo Oil at 65% and Maruzen Petrochemical Co., Ltd. at 35%



## Coker Unit

A new unit built at the Sakai Refinery of Cosmo Oil (with a capital investment of some ¥100 billion) scheduled to start operation during fiscal year 2010. In addition to the Coker unit, a Coker Distillate hydrodesulfurization unit is also newly being built. These units, when completed, will be used to produce naphtha, jet fuel and diesel fuel from an asphalt fraction.

These efforts are expected to provide benefits, such as cost reductions in the refining process by using heavy crude oil (by taking advantage of heavy-lighter crude oil price gaps, or price gaps between heavy crude oil and light crude oil aimed at maintaining the same distillate production rates as conventionally by using lower-priced heavy crude oil) and better responses to structural changes in oil product demand in Japan and higher refining margins with a shift to the production of intermediate fractions from that of a heavy oil fraction (by taking advantage of light-heavy distillate product price gaps, or price gaps between oil product and heavy fuel oil aimed at improving rates of producing more highly value-added lighter distillates), thereby improving profitability at the company.

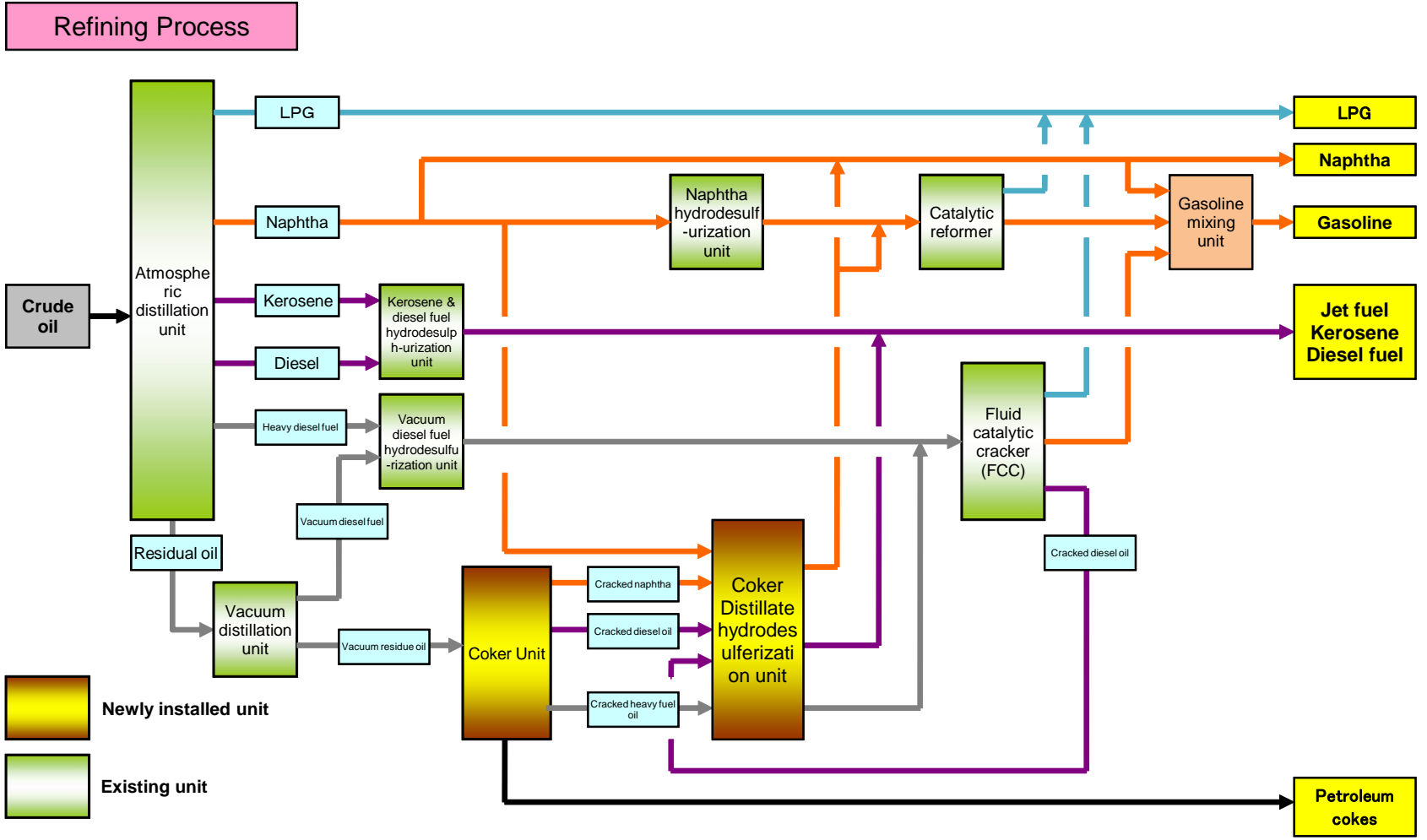
### <Outline of the New Facilities to Introduce>

- (1) Coker unit - Processing capacity of 29,000 BD
- (2) Coker Distillate hydrodesulfurization unit - Processing capacity of 42,000 BD

### <Outline of Production Capacity Expected>

Naphtha: 250,000 kl/year; Jet fuel: 700,000 kl/year; Diesel fuel: 350,000 kl/year;  
and Petroleum cokes: 400,000 tonnes/year

# <Refining Process Chart After Introduction of Coker and Other Units>



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## **Company with Audit and Supervisory Committee**

-Under the revised Companies Act, a Company with Audit and Supervisory Committee is prescribed as “any Stock Company which has an Audit and Supervisory Committee consisting of three or more directors (the majority of the member directors shall be outside directors) and the committee audits the execution of duties by directors.” By having more than one outside director who does not execute business, it is possible to separate the execution and supervision of management.

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## **Concession agreement**

- Agreement by which the mining right is directly granted to an oil company from the government or a state-run oil company of an oil-producing country by contract or permission.
- The oil company has the power of disposition of oils and gases that can be obtained by making an investment on its own, and profits are returned to the oil-producing country in the form of royalties from sales and taxes, etc.

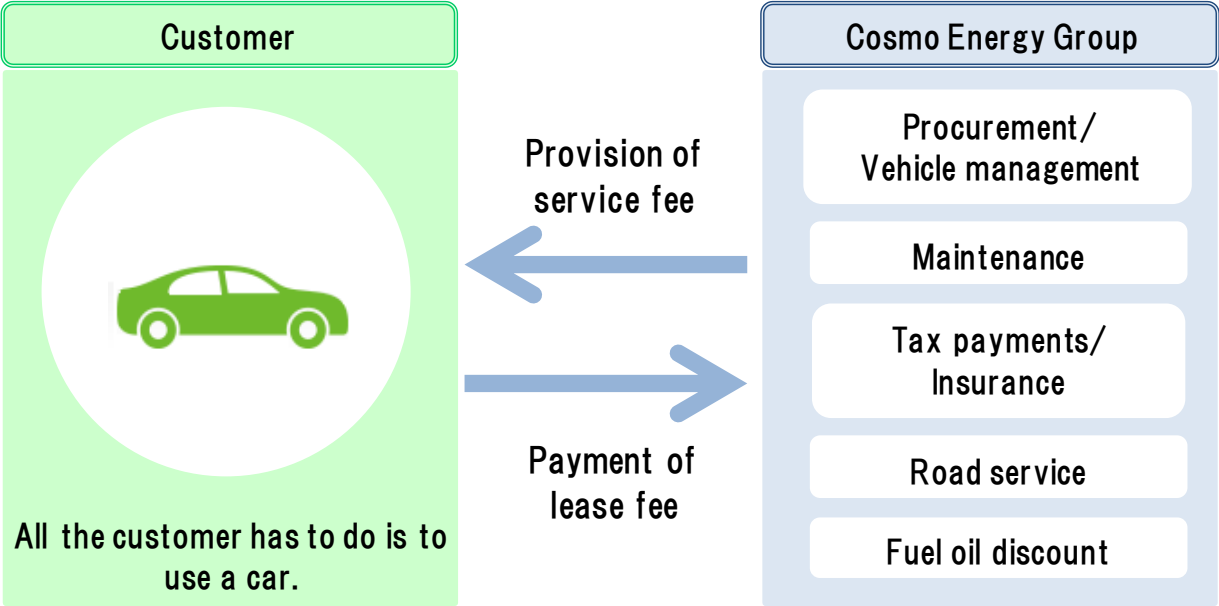
# COSMO B-CLE LEASE

An integrated, “one-stop” vehicle lease service encompassing procurement of vehicles, automobile safety inspection, car insurance, discounted fueling. With a monthly payment of fixed lease fee, customers can receive all of above services at our outfit without going anywhere else.

We have applied to the business method patent for our original services including discount on fuel fee and carry-in maintenance services.

Acquired business model patents for its own services such as fuel oil discount and maintenance carried-in discount in 2013.

## ■ System of Cosmo Smart B-cle (My Car Lease)



All the customer has to do is to pay a certain lease fee every month, and the Cosmo Energy Group conducts troublesome maintenance and tax payments.



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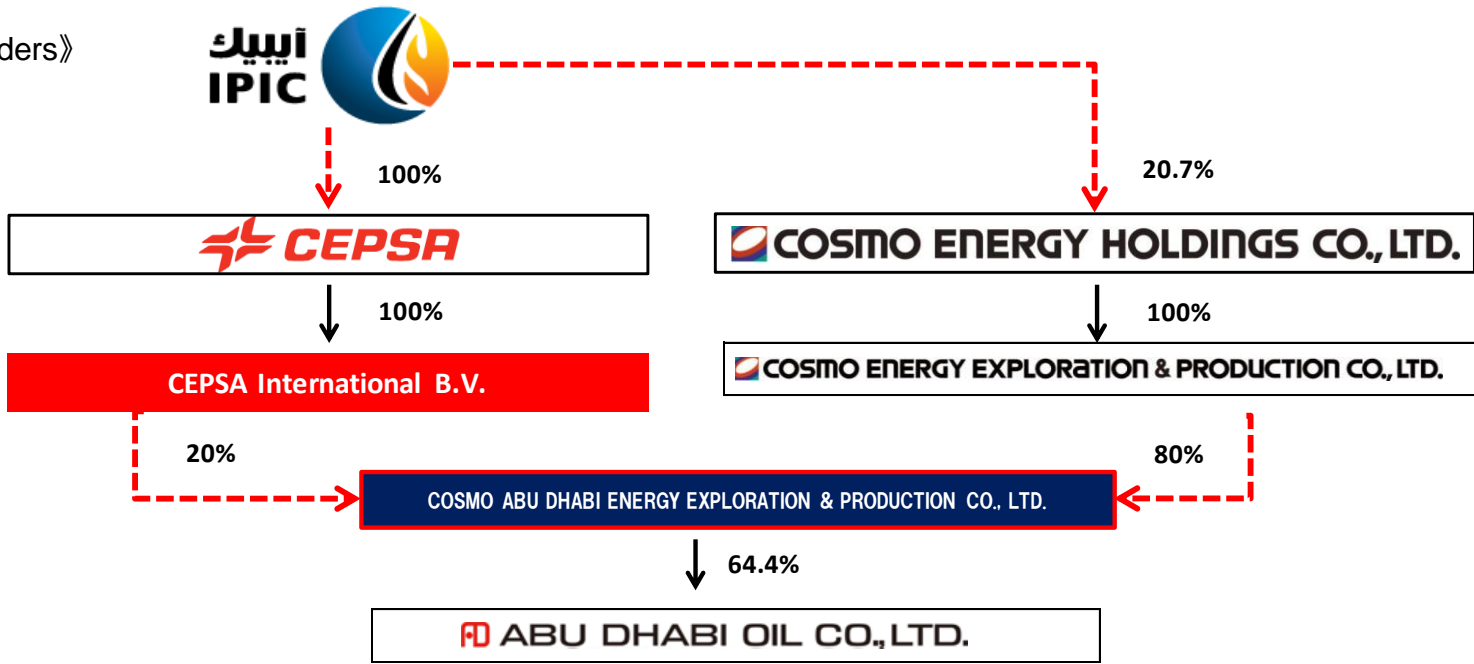
## Cosmo Abu Dhabi Energy Exploration & Production Co., Ltd.

- Established in November 2014 to control Abu Dhabi Oil Co., Ltd. and plan and promote new oil and gas projects in Abu Dhabi.
- Accepted an investment from CEPSA, a leading integrated oil company in Spain in the IPIC group, to strengthen the alliance.

### 《Overview》

- (1) Business
  - Promotion and management of oil E&P business at Abu Dhabi Oil Co., Ltd.
  - Planning and promotion of a new oil and gas project in Abu Dhabi of United Arab Emirates.
- (2) Established
  - November 2014
- (3) Capital
  - ¥4 million
- (4) Shareholders and ownership
  - Cosmo Energy Exploration & Production Co., Ltd. 80% and CEPSA International B.V. 20%

### 《Shareholders》



## **Cosmo The Card House**

Cosmo Oil's proprietary credit card that is available only at Cosmo Oil SSs.

The card provides great benefits for the three parties customers, dealers (SSs) and Cosmo Oil, respectively, as follows:

- Customers: Issuing cards immediately, cashless payment for purchases at the service station (SS), redemption of premiums (please refer to the section Mileage, Mile –Cosmo Gasoline Mileage), cash loans and many other benefits are available.
- SS: Actively issue new cards at the time of SS opening to set up a system so that customers will come back to Cosmo SSs and use the cards repeatedly.
- Marketing activities by utilizing POS (point of sales) data gathered through card use would help dealers enhance the ways they operate their SSs and increase sales.
- The card also makes it easy for SSs to process customer payments and offers the issuer's commission lower than credit sales companies'.
- Cosmo Oil: Enhancement in marketing tools and SS management is expected to bring more sales and more card commission revenues.

## **Cosmo The Card Opus**

Starting June 2006, "Cosmo the Card Opus" was issued in affiliation with AEON Credit Service Co. Ltd.

Co-branded with no annual fee international brands (VISA, MasterCard, JCB), the line-up will be able to accommodate a range of customer needs.

## **Desulfurization Catalyst**

The typical desulfurization process is such that sulfur (S) is removed in the form of hydrogen sulfide by reacting the sulfur contained in crude oil with hydrogen (H).

A catalyst is used to promote this chemical reaction.

## **Direct Hydrodesulfurization Unit**

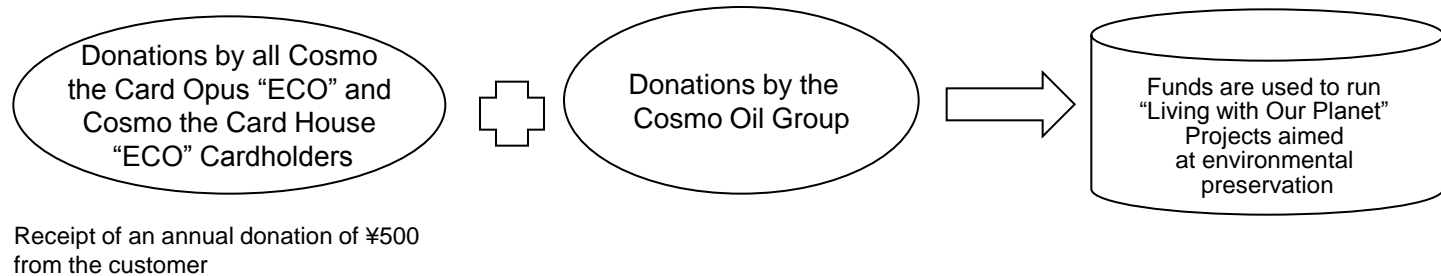
- One of hydrosulfurization units for heavy fuel oil
- The unit designed to remove sulfur component from residual oil derived by fractional distillation from crude oil through the atmospheric distillation unit (topper), converting the residual oil into hydrogen sulfide by reacting it with hydrogen at high temperature and high pressure in the tower type reactor filled with catalyst.

## Eco Card

Cosmo Oil's proprietary credit card providing an opportunity for its cardmembers to "participate in environmental preservation" activities in addition to the same features offered by Cosmo The Card Opus and Cosmo The Card House.

Two "Eco" cards are available: Cosmo The Card Opus "Eco" and Cosmo The Card House "Eco."

The Eco Card is designed to acquire new customers highly sensitive to environmentalism in addition to attracting Cosmo The Card targets.



- Note: In addition to that described above, Cosmo Oil will send to each cardmember the "Cosmo Oil Eco Card Fund Report" on environmental preservation activities and how donations from cardmembers will be used.

→ Please refer to Cosmo The Card House

## EcoPower Co., Ltd.

In March 2010, Cosmo Oil acquired all the shares (98.8%) owned by Ebara Corporation in its wind power generation subsidiary, EcoPower Co., Ltd. ("EcoPower"). EcoPower owns wind turbines in wind-rich areas, mainly in Tohoku and Hokkaido. Since 2004, Cosmo Oil has operated the Cosmo Oil Sakata Wind Power Plant (1,500 kw), a wind turbine in Sakata City, Yamagata Prefecture.

<Outline of Eco Power > (End of FY2013)

- Number of sites for power generation: 29
- Number of units: 128
- Total power generating capacity: 145,810 kw

Please refer to URL : <http://www.eco-power.co.jp/project.html>

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## Equity-method affiliate

Consolidated company of which the Company has 20% or more and 50% or less of voting rights.

## F Index

An index that dealers use to manage their SSs (or to raise their cost awareness)

The primary objective of introducing this index is to have each dealer understand the ratio of the gross margin of sales of the value added merchandise (including statutory car inspection, lubricating oil change, car wash, tires, batteries and accessories and other services and products) to labor cost to draw their greater attention to cost.

An SS with a larger index would be stronger with value added sales.

$$\text{Calculation method} = \frac{\text{Value added gross margin}}{\text{Labor cost}} \times 100$$

E.x., F Index value of more than 100%: A value added gross margin is offset by labor cost.

F Index value of more than 120%: Labor is more than offset by a value added gross margin. = Strong SS.

## FCC (Fluid Catalytic Cracking Unit)

FCC stands for fluid catalytic cracking unit.

This is a secondary decomposition unit designed to produce a larger quantity of lighter fuel oil fractions (mainly the gasoline fraction).

# Feed-in Tariff (FIT) Scheme for Renewable Energy

- The scheme introduced by the Japanese government for the purpose of promoting the use of renewable energy across Japan
- The scheme requiring electric companies to purchase electricity generated from renewable energy sources by existing and new facilities at a fixed price (procurement price) for a fixed period (procurement period).
- The price and period for procurement of electricity generated from wind power:  
 Class of 20 kW or more: ¥23.10 per kW (tax inclusive), or ¥22, tax-exclusive, for the 20-year period

(Source: The Agency for Natural Resources and Energy in the Ministry of Economy, Trade and Industry, “the Feed-In Tariff Scheme for Renewable Energy” published in July 2012)

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## Gyxis Corporation

- Established in April 2015 by absorption-type spin-offs of LP gas import and wholesale operations of Cosmo Energy Holdings, Showa Shell Sekiyu, TonenGeneral Sekiyu and Sumitomo Corporation, with former Cosmo Petroleum Gas Co., Ltd. as the receiving company, with the aim of integrating their LP gas import and wholesale operations. Gyxis Corporation has become one of Japan’s top-class LP gas import and wholesale companies by building an integrated structure through the integration of LP gas import and wholesale operations conducted by the four company groups (LP gas import/ procurement, shipping terminal operation, logistics and wholesaling) and overseas trading operations.

### 《Overview》

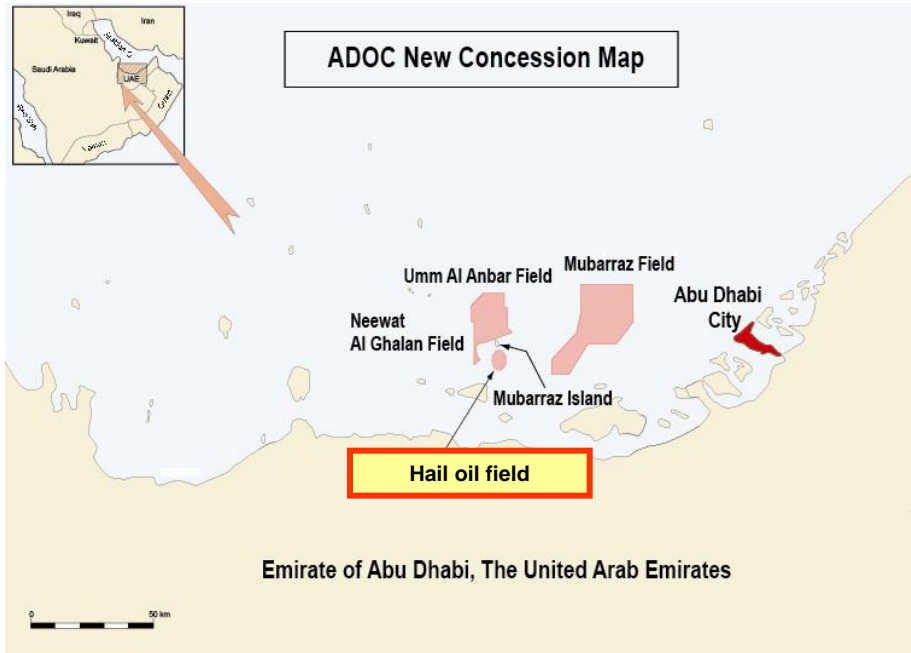
(1) Business	Manufacture, storage, transport, sale and import/export LP gas
(2) Capital	¥11.0 billion
(3) Established	April 2015
(4) Shareholders and ownership	Cosmo Energy Holdings Co., Ltd. 25%, Showa Shell Sekiyu K.K. 25%, Sumitomo Corporation 25% and TonenGeneral Sekiyu K.K. 25%

《Company Logo》

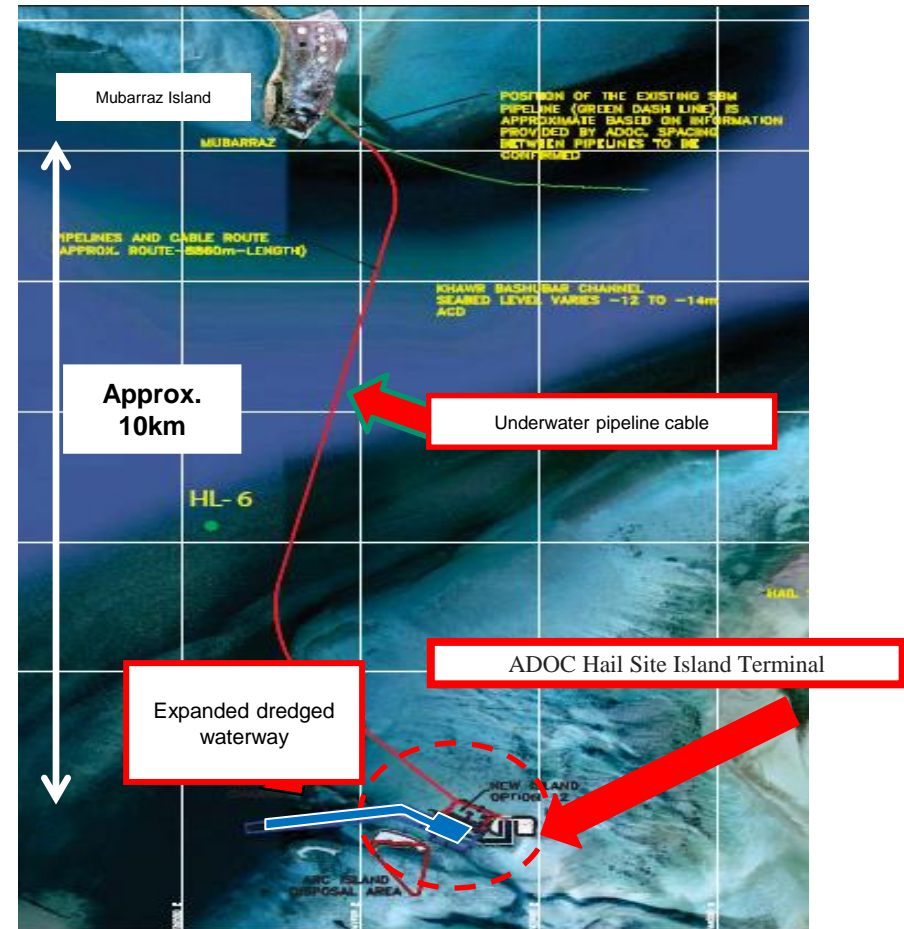


## Hail Oil Field

- We have extended our interests in existing three oil fields (Mubarraz Field, Umm Al Anbar Field and Neewat Al Ghalan Field) for 30 years since 2012 based on the solid trust built between Abu Dhabi Oil Co., Ltd. and the oil-producing country (Abu Dhabi of United Arab Emirates). We also acquired the Hail oil Field, which is expected to produce a volume equivalent to the existing three oil fields. Production is scheduled to begin in FY2017.
- The Hail Oil Field is a large project with high cost competitiveness, which is adjacent to the existing oil fields and able to share shipping facilities. It is expected to make a significant contribution to the stable earnings of the oil E&P business of the Cosmo Energy Group.

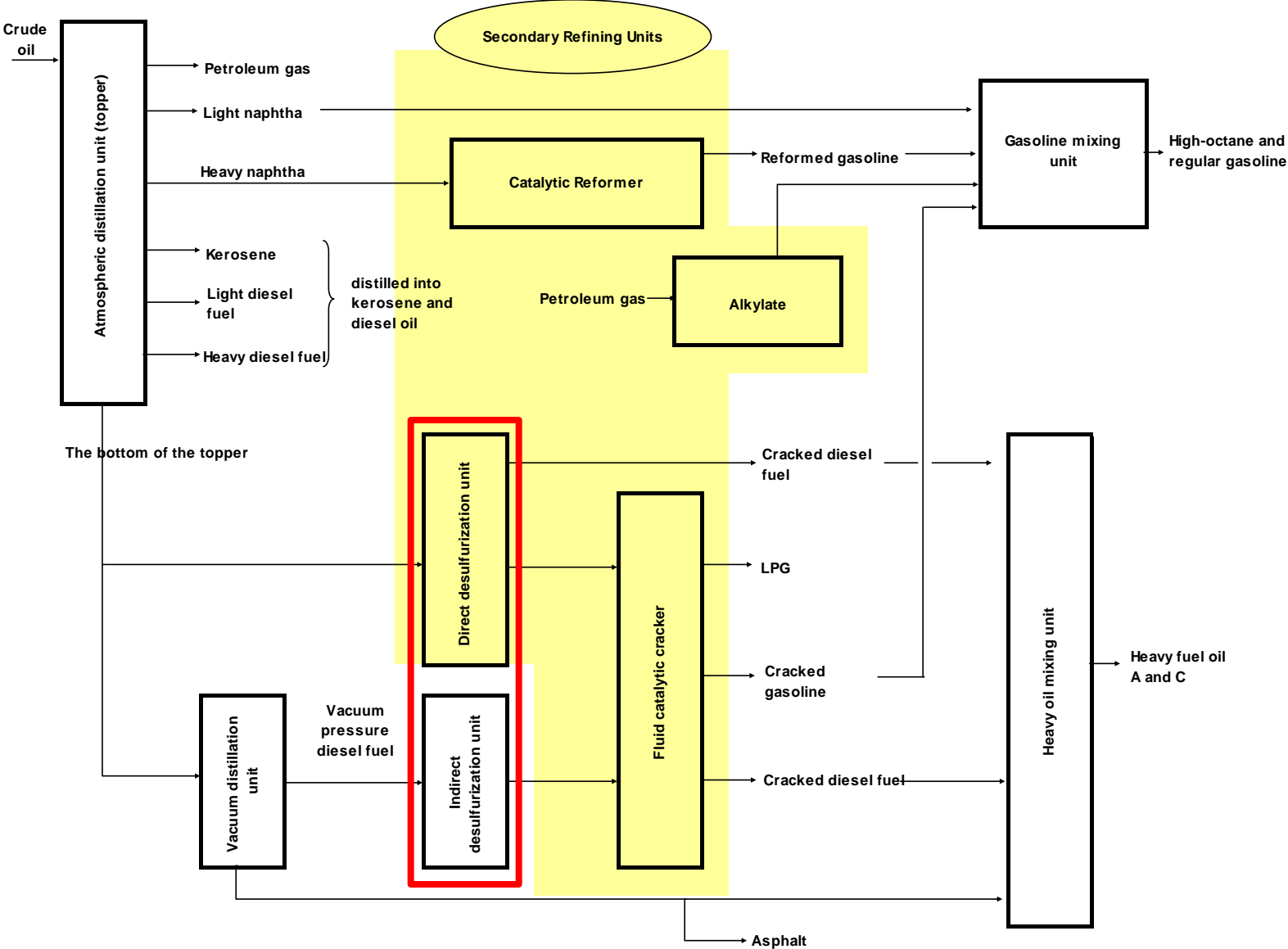


Hail oil field and existing shipping terminal (Mubarraz Island)



# Heavy Fuel Oil Desulfurization Units (Direct and Indirect)

Units designed to recover sulfur from what is in the bottom (or heavy fuel oil) of the atmospheric distillation unit





## House Card

House Card means Cosmo The Card House which can be used only at Cosmo Oil's network of service stations operated independently by Cosmo Oil Marketing Co., Ltd.

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## Hybrid financing (subordinated loans)

A form of hybrid financing with a nature between equity and debt.

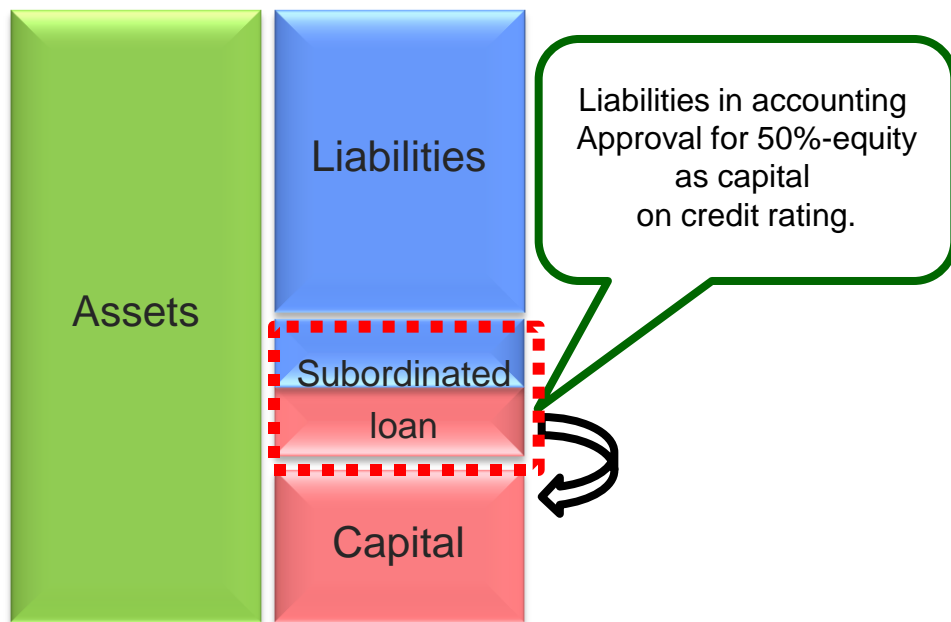
It is a financing method with a nature and characteristics similar to equity, such as the voluntary rescheduling of interest, the super-long repayment term, and subordination in liquidation proceedings and bankruptcy proceedings, although it is debt.

In the hybrid financing conducted by the Company in April 2015, an equity nature was recognized by a rating agency (Japan Credit Rating Agency, Ltd.) for up to 50% of the amount of the funds raised.

### Major Conditions

Total amount financed	¥60 billion
Borrowing period	60 years
Dates	April 1, 2015 – March 31, 2075
Equity content	50% (Japan Credit Rating Agency)
Applicable interest rate	<ul style="list-style-type: none"><li>April 1, 2015 – March 31, 2020 → Floating rate based on six-month euro-yen LIBOR</li><li>After March 31, 2020 → 1.00% step-up floating rate</li></ul>
Investors	Mizuho Bank, Ltd. The Bank of Tokyo-Mitsubishi UFJ, Ltd. Sumitomo Mitsui Banking Corporation

### Image of impact on balance sheet

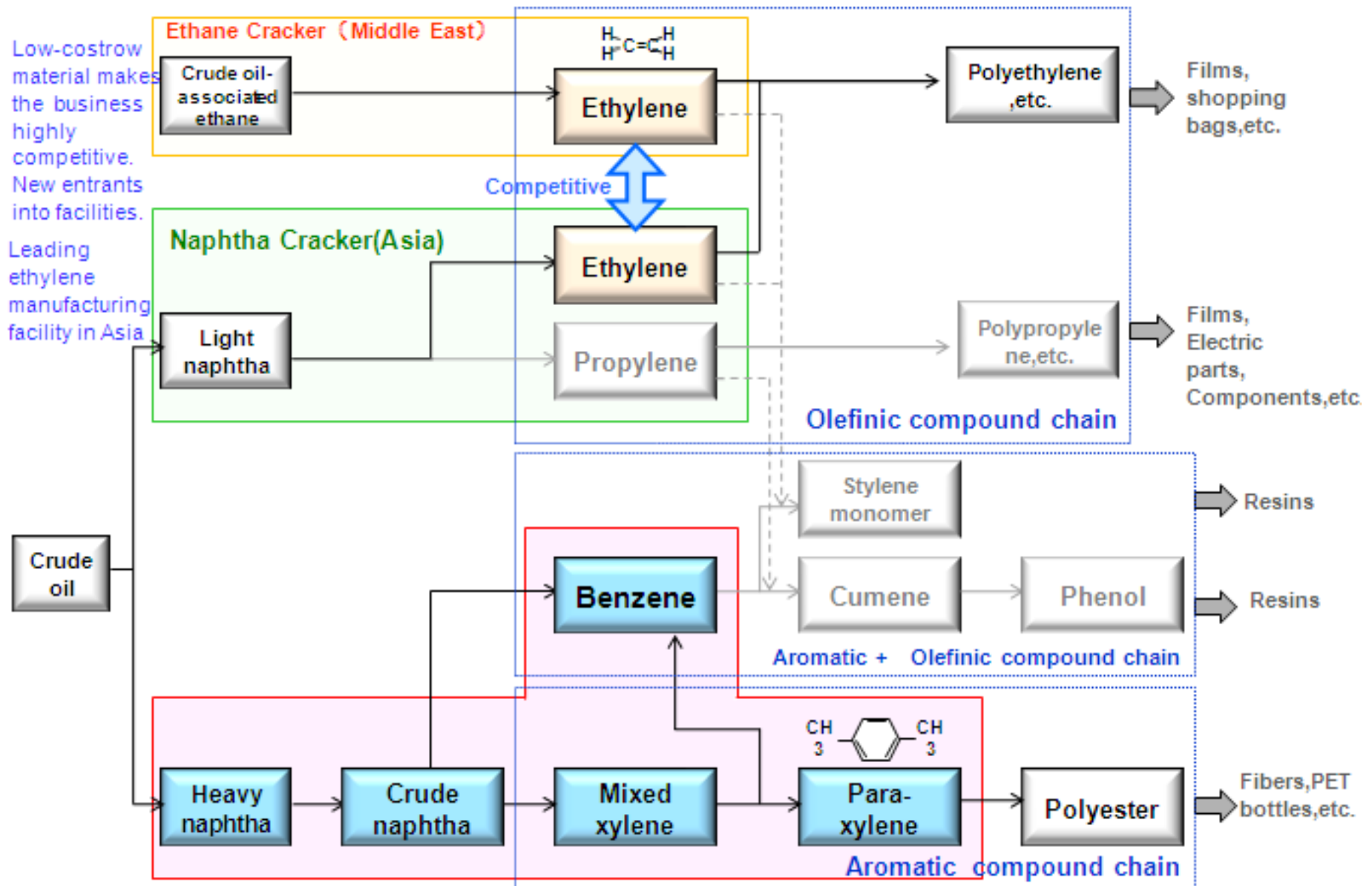


## **Hyundai Cosmo Petrochemical Co., Ltd (Ex. HC Petrochem)**

An equal joint venture company that Cosmo Oil established with Hyundai Oilbank Co., Ltd. (HDO) in November 2009. Using a paraxylene plant (with a production capacity of 380,000 tonnes per year) assigned by HDO, Hyundai Cosmo Petrochemical(HCP) started manufacturing and marketing paraxylene in February 2010. The new paraxylene production unit (with a production capacity of 800,000 tonnes per year) has been completed on November 2012. Commercial operations production and marketing of 1,180,000 tonnes of per year of paraxylene began in January 2013.

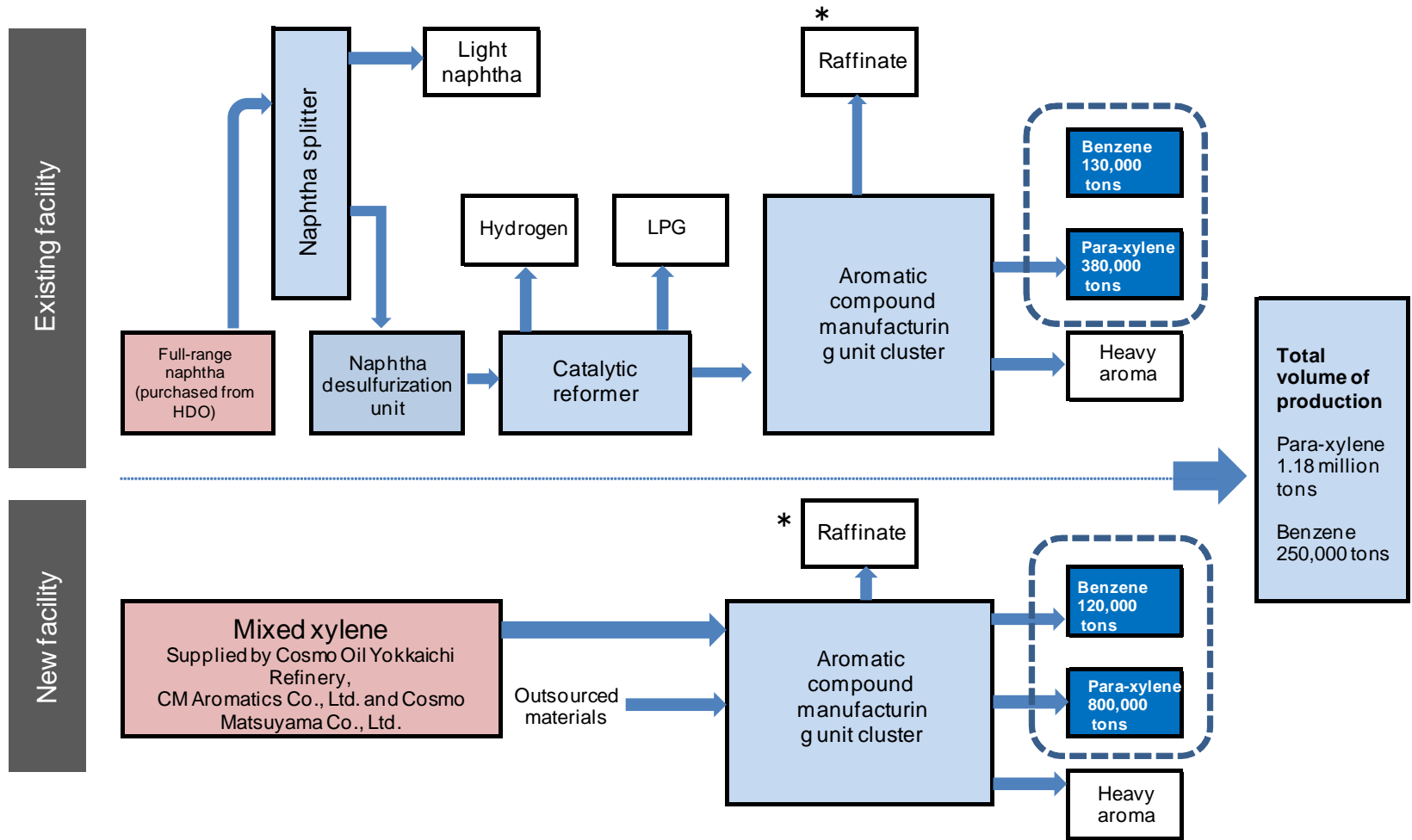
\* Please refer to “Hyundai Oilbank Co., Ltd. (HDO).”

※ Visualized Concept for Olefinic and Aromatic Products



The red framed indicates the scope of business done by Hyundai Cosmo Petrochemical Co., Ltd. (HCP)

※ Para-xylene manufacturing facility structure in the JV business:



\* The raffinate collectively refers to a product that remains insoluble in a solvent extracted in the solvent extraction process.

## **Hyundai Oilbank Co., Ltd. (HDO)**

HDO is an oil refining and marketing company based in the Republic of Korea. Established in 1964, HDO processes crude oil at 390,000 barrels a day.

As part of its joint projects with IPIC, Cosmo Oil in April 2008 signed a memorandum of understanding for comprehensive and strategic cooperation of the oil business with HDO. In June 2009, the two parties signed a memorandum of agreement in relation to the establishment of a joint venture company (JVC) for para-xylene business collaboration and in October 2009, the parties signed a memorandum of agreement for the establishment of the JVC to undertake the para-xylene business. Cosmo Oil and HDO established a joint venture company (Hyundai Cosmo Petrochemical Co., Ltd.) in November 2009.

Please refer to “Hyundai Cosmo Petrochemical Co., Ltd.”

## **IPIC**

Established in 1984, International Petroleum Investment Company is a wholly owned energy-related investment subsidiary of the Emirate of Abu Dhabi. IPIC is specialized in making long-term investments in oil and gas-related businesses outside Abu Dhabi. It owns about 20% of Cosmo Oil shares by accepting a third-party allotment offered by Cosmo Oil.

## **IPP (Independent Power Producer)**

Electricity wholesale business

Cosmo Oil has built a 200,000-kw power station adjacent to its Yokkaichi Oil Refinery, currently supplying electric power to Chubu Electric Power Co. starting from July 2003.

## Keiyo Seisei JV G.K.

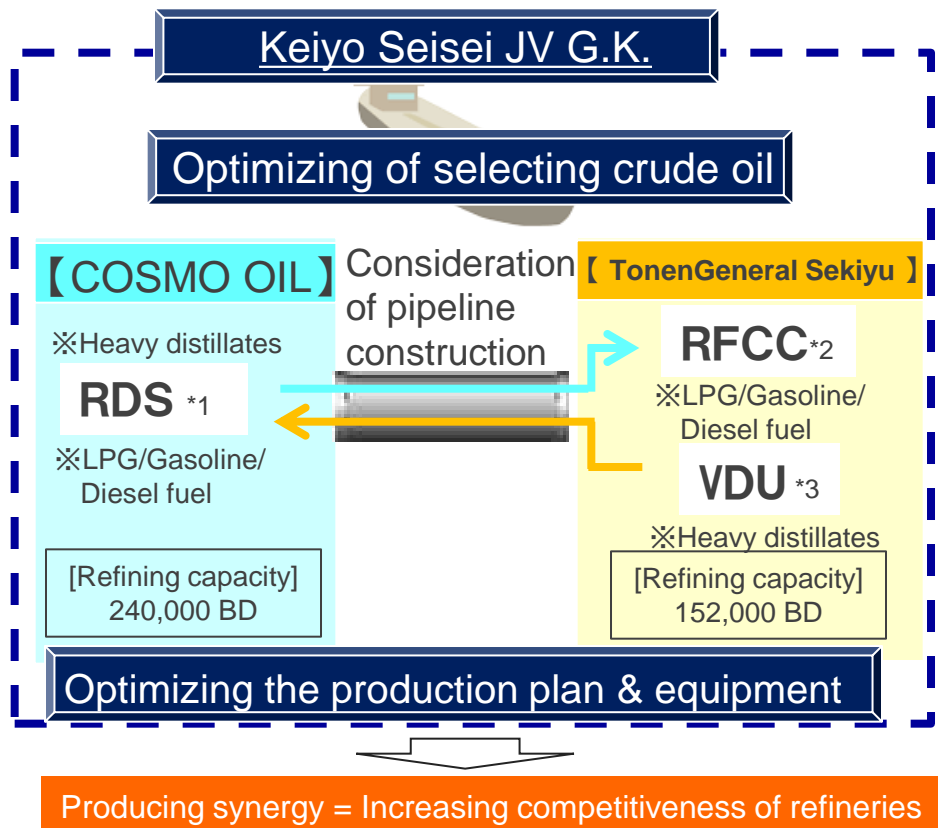
Joint venture company established with TonenGeneral Sekiyu in January 2015.

(Ownership: Cosmo Oil and TonenGeneral = 50:50)

Construction work of a pipeline that connects Chiba refineries of the both companies began in June 2015.

It aims to create synergy of more than ¥10 billion a year by increasing the added value of products through integration of refining facilities of the both refineries after the completion (2018).

<An example of Synergy>



\* 1)RDS=Residue Hydro desulfurization unit

\* 2)RFCC=Residue Fluid Catalytic Cracker

\* 3)VDU= Vacuum Distillation Unit

## Maruzen Petrochemical Co., Ltd.

We made Maruzen Petrochemical Co., Ltd., which had been an equity-method affiliate, a consolidated subsidiary in March 2016 with the acquisition of additional shares.

With one of the largest ethylene production capacities in Japan, it continues to supply high-quality products and has solid financial strength.

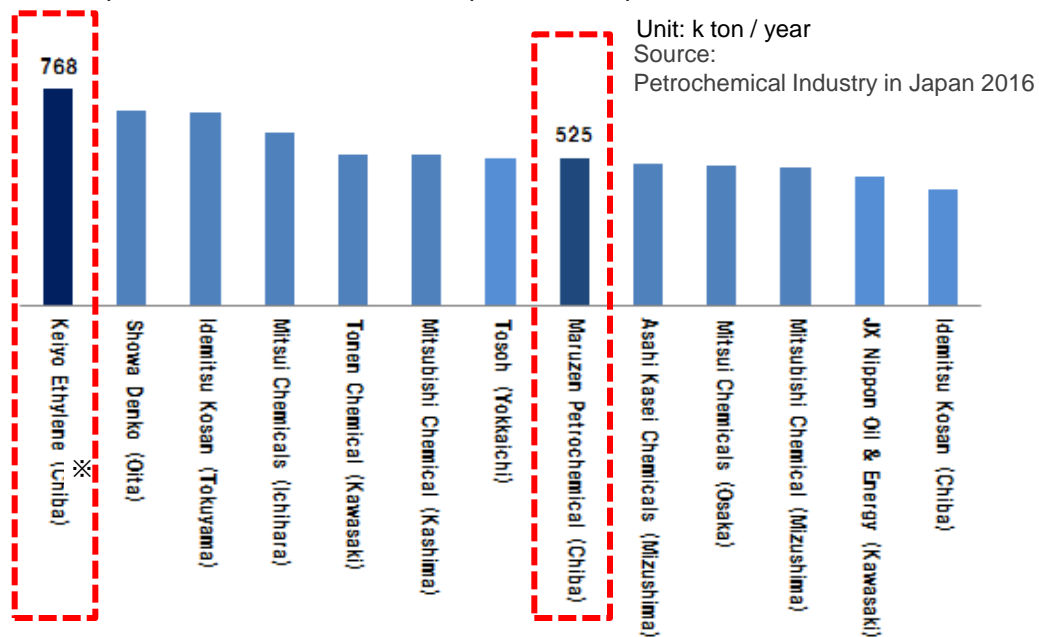
### Overview of Maruzen Petrochemical Co., Ltd.

Business	Manufacture and sale of basic petrochemical products such as ethylene, propylene and benzene, solvents such as methyl ethyl ketone, and other functional chemicals	
Established	October 10, 1959	
Capital	10 billion yen	
Shareholders	Company	Ratio of voting rights
	Cosmo Energy Group ※	52.7%
	Ube Industries, Ltd.	13.2%
	Denka Co., Ltd.	13.2%
	JNC Corporation	13.2%
	Other	7.7%

※Cosmo Energy Holdings Co., Ltd., Cosmo Matsuyama Oil Co., Ltd.

### Domestic production capacity of ethylene

Maruzen Petrochemical uses its two plants, including Japan's largest and newest plant for naphtha cracker, to remain competitive in Japan.

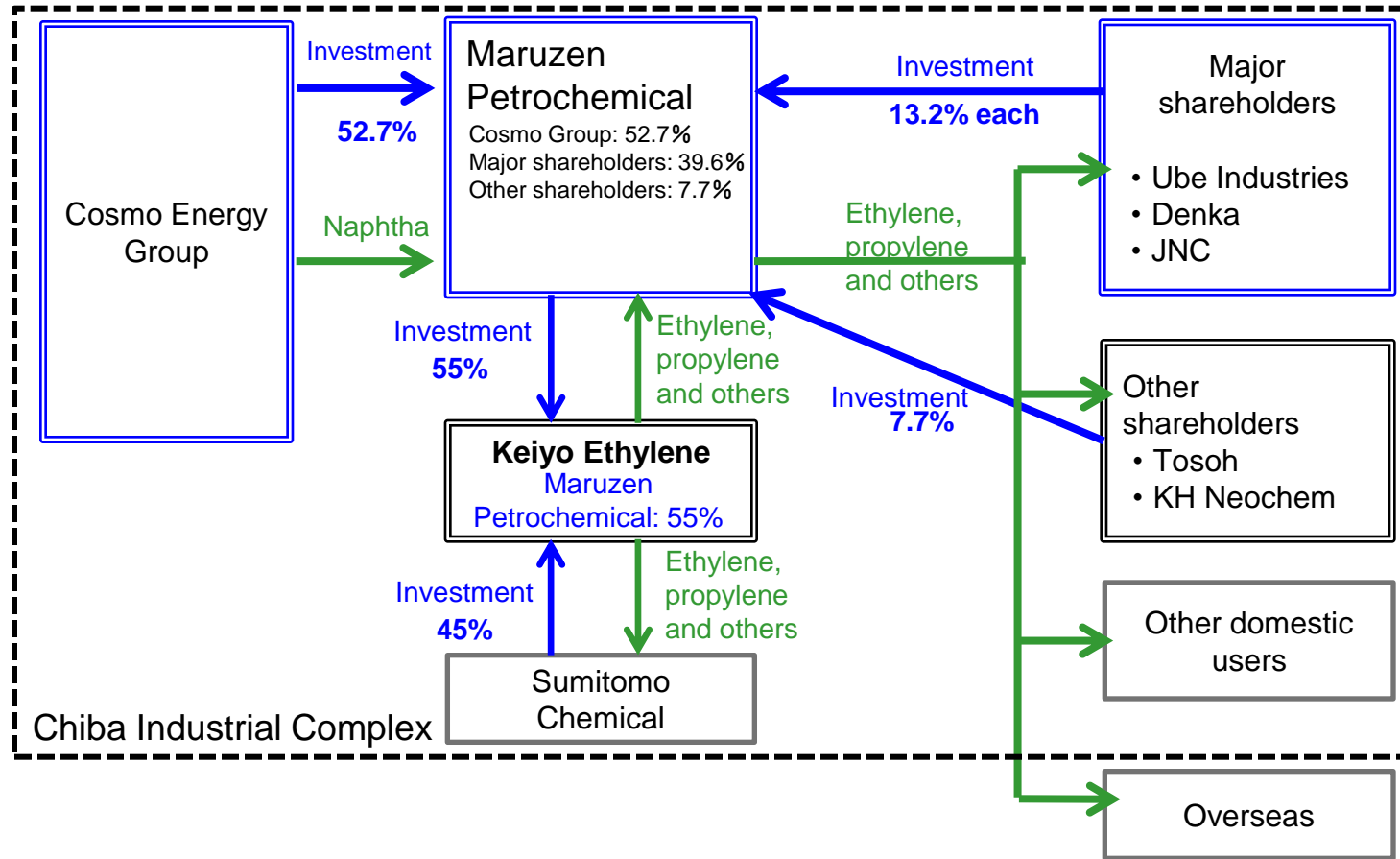


※Keiyo Ethylene Co., Ltd. is a consolidated subsidiary of Maruzen Petrochemical with a 55% stake.

# 《Capital Relationship with Industrial Complex of Maruzen Petrochemical》

→ Product flow

→ Investment (Ratio of voting rights)





## Mixed Xylene

A raw material used to manufacture para-xylene. Mixed xylene is mainly produced based on reformat (base material for gasoline) that is manufactured by an oil company.

Please refer to “Para-xylene.”

## Number of Cards in Force

The net number of “Cosmo The Card” cardmembers after the deduction of the number of ex-cardmembers.

The actual number of cardmembers as of today.

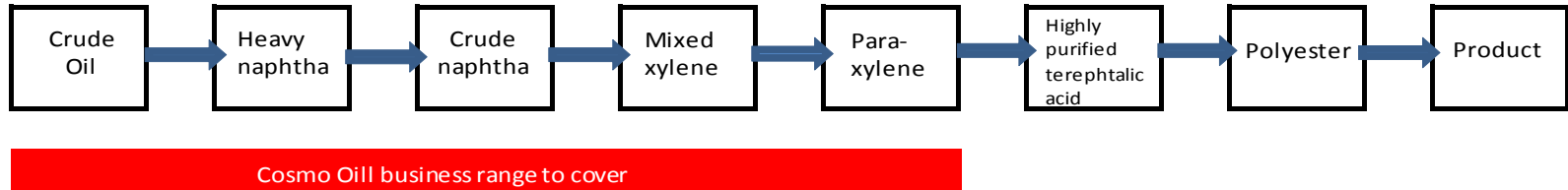
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## Operations Management System (OMS)

- OMS is a mechanism to set an activity policy consisting of 23 requirements as essential and important items to achieve safe operation and stable supply and for the head office and refineries to enhance their efforts in each activity based on the policy.
- Cosmo Oil, which assumes the supply sector of the Cosmo Energy Group, established its own Operation Management System (OMS), which is the company-wide unified management system to maintain the appropriate operation management and promote continuous improvement thereof, and began operating it in January 2016.
- Cosmo Oil aims to achieve the safe operation and stable supply of the world standard or better by continuously operating and strengthening the OMS.

## Para-Xylene (PX)

- Aromatic compounds that are used to manufacture PET bottles and polyester textile products.
- Production Process from Crude Oil to Product .

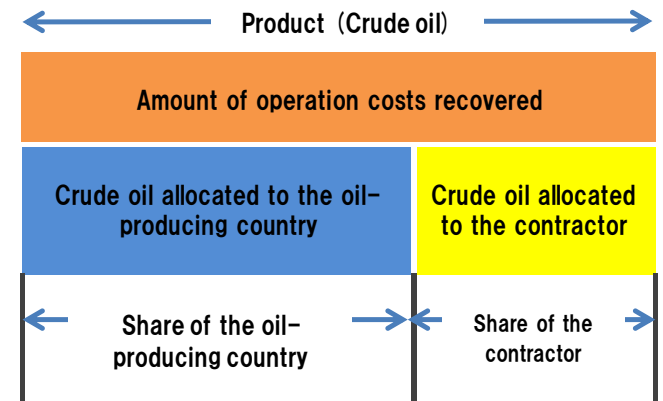


- Mixed xylene: Please refer to the section of “CM Aromatics Co., Ltd
- Para-xylene: Please refer to the sections of “Hyundai Oilbank Co., Ltd.” and “Hyundai Cosmo Petrochemical Co., Ltd.”

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## Production sharing contract (PS contract)

- A contract by which one or more than one petroleum and natural gas development company contracts for exploration and development works at its own costs from the government or a state-run oil company of an oil-producing country as a contractor and recovers the costs and receives payments by products.
- If oil or natural gas comes to be produced as a result of exploration and development works, the contractor will recover the exploration and development costs from certain of the products and allocate the remaining products between the government or the state-run oil company and the contractor according to a certain allocation ratio.



## Sales Unit, or SS Sales Unit

A monthly sales volume of automobile fuel oil per SS

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## Service agreement

Agreement by which an oil company contracts for exploration and development works and receives certain payments.

## Sogo Energy Corporation

In November 2012, Cosmo Oil acquired all the shares (97.08%) owned by Sojitz Corporation in its subsidiary, Sojitz Energy Co., Ltd. In February 2013, the name of corporation changed from 'Sojitz Energy Corporation' to 'Sogo Energy Corporation'. The numerous procurement sources, loyal customers, talented personnel and know-how of Sojitz Energy, will all strongly contribute to Cosmo Oil's domestic marketing strategy, and furthermore, create significant synergies in our supply stability and logistics network.

«Company Logo»



# SS NV Index

This refers to a management evaluation index that provides navigation for SS operators to strengthen their management of SSs (or to build the management basis to improve profitability even if they face such an unfavorable business environment that may reduce operating margins).

The primary objective of the introduction of this index is to have SS operators understand the management policy of minimizing costs to operate an SS, while maximizing a value added gross margin (to be earned from selling statutory car inspection, lubricating oil change, car wash and other services and tires, batteries and accessories and other products) and gasoline and diesel fuel sales.

A dealer would become stronger if it achieves a smaller index value (or even minus figures).

Minimize SS operating expenses

Calculation method = 
$$\frac{\text{Direct SS operating expenses} - (\text{Value added gross margin} + \text{Kerosene gross margin})}{\text{Automobile fuel (gasoline + diesel fuel) sales volume}}$$

Maximize a combined non-fuel gross margin

Maximize a combined fuel sales volume

# Sulfur-Free Gasoline and Diesel Fuel

Gasoline and diesel fuel containing 10 ppm of sulfur or less, respectively.

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## Three core companies

- Collective term for Cosmo Energy Exploration & Production Co., Ltd. (oil development and production), Cosmo Oil Co., Ltd. (oil refining and petrochemical) and Cosmo Oil Marketing Co., Ltd. (sale of petroleum products and the retail business, etc.)

## Topper ( Crude Distillation Unit )

An atmospheric distillation unit. Generally speaking, the crude oil processing capacity of an oil refinery is represented by its CDU's processing capacity per day.

## Total Number of Cards Issued

The cumulative number of "Cosmo The Card" cards issued so far, including the number of cardmembers who have been withdrawn.

## Wind power generation

→ Please refer to "EcoPower Co., Ltd."

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## Yokkaichi Kasumi Power Co., Ltd. (electricity wholesale supplier)

It plans to carry out modification works, which enable it to generate electricity by means of petroleum cokes as well as conventional residual, and then operate the power plant, using Yokkaichi Kasumi Power Plant of Cosmo Oil.

### 《Overview》

- (1) Business
  - Modification works of power plants (diversification of fuels)
  - Electric power generation and selling business
- (2) Power generating capacity 200,000kW
- (3) Established February 2016
- (4) Capital ¥10.5 billion (including legal capital surplus)
- (5) Shareholders and ownership Cosmo Energy Holdings Co., Ltd. 61% and Development Bank of Japan Inc. 39%