A

- **Amino acid**
  Amino acid is a general term of organic compounds containing amino group (-NH2) and carboxyl group (-COOH) within its molecule. Most organic proteins consist of 20 types of amino acids. However, there are amino acids that are not included in proteins.

- **AR and GA oilfields**
  “AR” refers to the Umm Al Ambar Oil Field, and “GA” to the Neewat Al Ghalan Oil Field. Abu Dhabi Oil and its affiliate Mubarraz Oil operate the AR, GA and Mubarraz Oil Fields, mix the crude produced by the 3 fields and ship it as “Mubarraz Blend”.

- **Aromatics**
  Compounds that have benzene and benzene rings as part of their chemical structure. They may have two or more condensed aromatic rings, or the hydrogen atoms on the ring may be replaced by a member of the alkyl group (toluene, xylene, etc.)

- **Associated gas**
  This refers to gas that emerges from an oil field during crude oil production. There are two types of associated gas, sweet and sour. Sour gas refers to natural gas containing more than trace amounts of acid gas such as carbon dioxide and hydrogen sulfide.

- **Atmospheric distillation unit**
  Crude oil is composed of a variety of hydrocarbon compounds. The atmospheric distillation unit takes advantage of the different boiling points of these compounds to “crack” crude oil into separate fractions—gasoline, kerosene, diesel fuel, fuel oil and other components—under atmospheric pressure. In general, the scale of a refinery is defined by the process capacity of its atmospheric distillation unit.

B

- **Barrel**
  A unit for expressing oil volume, equivalent to approximately 159 liters.

- **Benzene**
  Benzene has attracted concern for its hazardous effects on human health and has been classified by Japan’s Ministry of the Environment as a noxious air pollutant requiring priority action.

C

- **Catalytic reformer**
  A unit that raises the octane number of naphtha that has been cracked by the atmospheric distillation unit, producing a gasoline component. Hydrogen, a by-product of chemical reactions in this unit, is used in desulfurization.

- **COD**
  Refers to chemical oxygen demand, an index of water pollution. Expresses the volume of oxygen required for oxidation of oxidizable substances (organic matter, etc.) in water.

- **Cogeneration system**
  An energy supply system that uses heat emitted at the time of electricity generation to meet demand for heat for heating, cooling or hot water. This is expected to lead to an improvement in integrated energy efficiency.

- **Crude oil equivalent throughput**
  Value used when calculating the unit energy consumption of a processing equipment, which is obtained by converting the volume of oil passing through it into an equivalent amount of crude oil processed by the atmospheric distillation unit. This value is meant to reflect the operating conditions of each equipment, offsetting discrepancies in the type and structure of facilities used in different refineries. The crude oil equivalent throughput of a processing equipment is derived by: [throughput volume] x [complexity factor]. The complexity factor of a given equipment is its construction cost per throughput, relative to the atmospheric pressure distillation unit (whose complexity factor is 1). The crude oil equivalent throughput of a refinery on the whole is the aggregated crude oil equivalent throughput values of its entire processing equipment fleet.

D

- **Decentralized power source**
  A small-scale power source utilized in a business or home, such as a cogeneration system, fuel cell or wind power generator. This has a number of advantages, such as that energy loss is reduced at the time of transmission as compared with electricity supply from a remote, large-scale power station.

- **Dioxins**
  Refers to PCDD (polychlorinated dibenzodioxins), PCDF (polychlorinated dibenzofurans) and coplanar PCB (polychlorinated biphenyl) collectively. They are claimed to be toxic and carcinogenic.

- **Double-hulled tankers**
  Ships fitted with a double-hulled structure to prevent oil spillage in case of accident.

- **DPF**
  Stands for Diesel Particulate Filter, a filter that removes the soot from the exhaust gas of diesel automobiles.

E

- **Electrostatic precipitator**
  An electrostatic precipitator is a device that administer an electric charge to fine particles and liquid mist, etc. floating in gas and removes them using electrostatic energy. Highly efficient collection of even fine particles is possible with low pressure loss, so this equipment is widely used at large scale generating facilities such as thermal power stations.

- **Emissions trading**
  Emissions trading often seems to be used with reference to trading in accordance with Kyoto Mechanisms under the Kyoto Protocol. Emissions trading is a mechanism allowing countries that have commitments to meet targets for greenhouse gas emissions reductions to acquire or assign portions of their emissions allowance.
  Emissions rights, i.e. “rights to emit” or “credits for absorbing” greenhouse gases, are also being traded under various systems and contracts.

- **Environmental risk management**
  Environmental risk is a possibility (threat) that environmental contamination or changes (environmental impact), which are generated by human activities, affect human health or ecosystem through environmental pathways under certain conditions. Environmental risk management is a process of confirming, evaluating, selecting and implementing of necessary measures in order to reduce the environmental risk.

- **EPS**
  Stands for Environmental Priority Strategies In Product Design, a life cycle impact assessment method managed by the Centre for Environmental Assessment of Products and Material Systems, a research organ of Shalmas University of Technology in Sweden.

- **Exhaust gas denitrizer**
  A device for removing NOx from exhaust gas. One method involves reduction using ammonia and a catalyst, and another method involves having NOx absorbed by an absorbing liquid.

F

- **Fluid catalytic cracker**
  This unit uses a minute-particle catalyst to crack heavy fuel oil. The cracked oil is divided into LPG, gasoline, diesel fuel and heavy fuel oil. The gasoline component produced by this unit has a high octane number, and accounts for a high proportion of ingredients mixed in other products.

- **FTSE**
  A joint venture company of the Financial Times and the London Stock Exchange which publishes various stock indices. In March 2003, Cosmo Oil was included as the first Japanese oil company on the FTSE4Good Global Index, an international socially responsible investment index.

G

- **Green purchasing**
  Green purchasing is purchasing of goods and services at which purchasers carefully examine the necessity of those and selectively purchase in order from those with the least environmental impact.

H

- **HCCI combustion**
  Stands for homogeneous-charge-compression-ignition combustion, a technology for igniting fuel without using a spark plug that can be used for developing a engine that can high efficiency matching that of a diesel engine, without emission of nitrogen oxide and soot, etc.

- **Hydrocarbon vapor**
  Hydrocarbon vapor is a type of hydrocarbon steam generated by gasoline, benzene or toluene. In most cases it diffuses from oil storage depots, loading zones for oil tankers or distribution bases for chemical products. It is recognized as one of the causes of photochemical smog and malodor.

- **Hydrodesulfurization unit**
  This unit uses a catalyst to make the sulfur compounds in the petroleum react with hydrogen, converting the sulfur to hydrogen sulfide, which is then removed. Desulfurization can be performed for each fraction, such as naphtha, kerosene, diesel fuel, and heavy fuel oil, etc. Industry has installed new gas oil desulfurization units to respond to tougher regulations on sulfur content and to meet voluntary targets. Heavy fuel oil desulfurization units are further divided into residue and vacuum gas oil (VGO) desulfurization units. The former removes sulfur from heavy oil fractions that have been cracked in an atmospheric distillation unit. The latter removes sulfur from heavy oil fractions after the asphalt fractions have been cracked in a vacuum distillation unit.

I

- **Immuno assay method**
  It is a method to measure target substance in a specimen making use of antibody's property of specifically combining with antigens.

- **ISO 14001**
  International standards for environmental management systems, issued by the International Organization for Standardization, which prescribe standards for establishing measures for reducing the environmental impact of business activities, goods and services.

J

- **JHFC**
  The Japan Hydrogen & Fuel Cell Demonstration Project is a project implemented by the Ministry of Economy, Trade & Industry, composed of “Research and demonstration of fuel cell vehicles” and “Demonstration study of hydrogen fueling facilities for fuel cell vehicles.”

K

- **Kerosene heat pump air conditioner**
  A heat pump is a system for collecting heat from a low-heat object and transferring it to a high-heat object. A kerosene heat pump air conditioner involves the movement of a compressor using kerosene as fuel, repeating vaporization and liquefaction of the medium transmitting the heat and thus providing heating or cooling.

- **Kyoto Mechanisms**
  With a target to stabilize the concentration of greenhouse gases, etc. in the atmosphere, the United Nations Framework Convention on Climate Change was signed in the Earth Summit 1992 in Rio de Janeiro. To achieve the specific targets of this treaty, the Kyoto Protocol was adopted at the COP3 (the Third Conference of the Parties). The Kyoto Protocol mandates developed nations to reduce greenhouse gas emissions (Japan 6%, US 7%, EU 8%) between 2008 and 2012 from the 1990 level. Kyoto Mechanisms are the economic means introduced aiming to achieve the targets more flexibly with higher cost/benefit rate.
  Kyoto Mechanisms include three mechanisms; emissions trading, CDM (Clean Development Mechanism) and JI (Joint Implementation).
  CDM is the mechanism to allow developed nations with reduction targets to obtain emission rights for the amount equivalent to the amount of greenhouse gas emissions reduced (absorbed) through their efforts implemented in developing nations that do not have reduction target. JI means transfers and acquisitions of the emission rights between developed nations that are obtained as a result of implementation of activities for reduction of greenhouse gas emissions and enhancement of absorption.

L

- **Life cycle inventory (LCI)**
  A quantitative and objective catalogue of the environmental impact of a product throughout all stages from the obtaining of raw materials through production, transportation, use, disposal, etc.

N

- **NOx (nitrogen oxide)**
  A collective term for nitrogen oxides, of which the principal air pollutants are nitrogen monoxide and nitrogen dioxide. Most factory smoke and automobile exhaust gas consist of nitrogen monoxide, which under the influence of ultra-violet rays, reacts with oxygen and ozone to form nitrogen dioxide. Nitrogen dioxide is the subject of air pollution controls based on health concerns. Nitrogen oxides are a cause of photochemical smog, and also of “acid rain” the same as sulfur oxides. Dinitrogen monoxide (nitrous oxide) is also a greenhouse gas.

O

- **Octane number**
  The octane number is one gauge of motor gasoline quality. The higher the octane number, the less engine knocking will occur. JIS standards specify an octane number of at least 89.0 for regular gasoline, and at least 96.0 for premium gasoline.

- **Oil boom**
  A boom to prevent oil from spreading on the surface of the sea. It is located on piers and is extended over the water surface by tugboats.

P

- **Particulate matter (PM)**
  Particulate matter in the atmosphere. Suspended particulate matter (SPM) is held to be a cause of air pollution, and is defined as particulate matter suspended in the air with a particle diameter of 10m or less. “Minute-particle matter”, where the particle diameter is 2.5m or less, is called PM2.5, and is regarded as a cause of asthma and bronchitis.

- **PCB**
  Stands for Polychlorinated Biphenyl, an excellent thermostat and electrical insulator, having been used in transformers, condensers, heat transfer media and carbonless paper. However, PCBs are difficult to dissolve, accumulate in the body and are toxic, causing skin problems and damage to liver functions. Currently the manufacture and import of PCBs is in principle prohibited, and their storage and disposal is controlled by law.

- **PRTR**
  Stands for Pollutant Release and Transfer Register. Businesses must keep track of, and report to the authorities the volumes of releases into the air, water and soil and the transfers outside their plant as waste material of prescribed chemical substances. Enacted in 1999, the system came into force in 2001.

R

- **“Research and Development of Petroleum Refining Pollutant Reduction Technology” Project.**
  This is a project commissioned by NEDO (New Energy and Industrial Technology Development Organization) to PEC (Petroleum Energy Center) aimed at developing technologies for reducing environmental pollutants included in petroleum products, etc.

S

- **SL**
  An international standard for gasoline engine oil prescribed by the API (American Petroleum Institute).

- **SOx (Sulfur oxide)**
  A collective term for oxides of sulfur, of which the principal air pollutants are sulfur dioxide, sulfur trioxide and sulfur mist generated by the combination of the sulfur oxides with water in the air. When sulfur oxides react with water they show strong acidity, and are a cause of acid rain.

- **Stowage ratio**
  The ratio of the actual stowage volume to the capacity of a tank.

- **Sulfur free fuel**
  Automobile fuel having sulfur content not exceeding 10ppm. Planned to be introduced in Europe in 2009.

- **Sulfur recovery unit**
  The unit collects sulfur from by-product gases containing hydrogen sulfide emitted from hydrodesulfurization unit or other oil refinery facilities.
  Large quantity of sulfur oxide is emitted when gases containing hydrogen sulfide are directly used as fuel. Oil refineries therefore remove hydrogen sulfide from by-product gases before using them as fuel, and collect sulfur from the hydrogen sulfide.

- **Sour water treatment unit**
  The wastewater discharged from hydrodesulfurization units and other refinery equipment contains hydrogen sulfide and other odorants. This unit uses steam injection to remove odorous materials. The hydrogen sulfide removed by this unit is then processed by the sulfur recovery unit.

U

- **Unit energy consumption**
  It is a value calculated when dividing total energy consumption at oil refinery by crude oil equivalent throughput. The unit is “kl-crude oil/1000kl”.Total energy consumption is converted into crude oil, and the unit is “kl of crude oil”.

V

- **Vacuum distillation unit**
  A unit that distills under reduced pressure. When oils with a high boiling point, such as heavy fuel oils, are heated, they may break down before vaporization can happen. By reducing the pressure in the unit, the boiling point of the oil is reduced, allowing for efficient cracking of fractions.

- **VOC (Volatile organic compounds)**
  A collective term for organic compounds that are volatile at normal temperatures, covers a variety of substances including trichloroethylene, tetrachloroethylene and formaldehyde. VOCs easily spread out in the air and are a cause of photochemical smog. They not only cause pollution but also climate change.

Z

- **Zero emissions**
  Refers to a production system with “zero waste”, using the waste generated by an industrial process as recycling material in another industry.