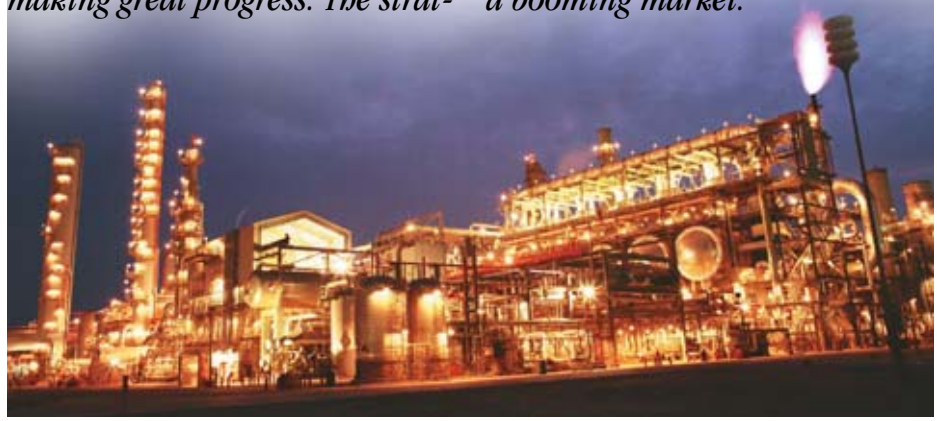
Our image of the Arab World as a backward crude-oil production monoculture is gradually becoming further and further removed from reality. The emphasis is shifting from crude oil production to the establishment of a petrochemical industry which is making great progress. The strategy of the Gulf States is to bring the entire value add chain from crude oil production right through to the final product into the region. As the following examples show, the scale of the projects is comparable to what is happening in China, which is also a booming market.



Picture: SABIC

Boom from *the Nile* to *the Gulf*

Linde to supply two polyethylene and one air separation plant to Al Jubail

Linde has been awarded the contract for supply and construction of two large polyethylene plants in Al Jubail, a center of petrochemical development in Saudi Arabia. The project was commissioned by a consortium led by Saudi Basic Industrial Corp. (SABIC) including investors from Japan. The order value is approximately €500 million. Dr. Aldo Belloni, member of the Executive Board of Linde and responsible for the business segment Gas and Engineering emphasizes the significance of Linde's first polythene plants in Saudi Arabia: "With this first polymer project to be delivered by Linde to Saudi Arabia, we further extend the technology platform in our business relationship with SABIC. So far, Linde has been primarily a supplier of tonnage oxygen plants to SABIC. This award, as well as the Linear Alpha Olefines (LAO) project already under construction at Al Jubail, demonstrate the ability of Linde to compete against its Asian peers in the region." The plants to be constructed turnkey by Linde's group company Linde-KCA-Dresden will have an annual production capacity of 800,000 tons of polyethylene and are scheduled to start operation in the first half of 2008. Additionally, Japan's Mitsubishi Heavy Industries and Linde signed a contract for the delivery of one of the worldwide largest air separation plants. The plant with a capacity of 108,000 cubic meters of oxygen will supply a new methanol plant also located in Al Jubail. The order volume for this project approximates €70 million. With this contract, Linde further strengthened its position as a leading supplier for air separation units. ■

Dr. Aldo Belloni, Linde: "With this first polymer project to be delivered by Linde to Saudi Arabia, we further extend the technology platform in our business relationship with SABIC."

Uhde wins contract for EDC plant complex in Oman

Uhde has been awarded a contract from Liwa Petrochemical Company LLC of Oman to build a new ethylene dichloride (EDC) complex in Sohar, some 200 km north-west of the capital Muscat. The EDC complex, which will have an annual capacity of some 300,000 tons, will include the construction of a chlor-alkali electrolysis plant. Uhde's scope of supplies and services will cover the licence, basic engineering and supply of equipment as well as training the operating personnel and assisting in the commissioning activities. The contract is worth some US$ 23 million. The plants are scheduled for completion in 2008. ■

Technip to build a major ethylene plant in Kuwait

Technip has signed a Memorandum of Understanding with The Kuwait Olefins Company, a joint venture between The Dow Chemical Company, Petrochemical Industries Company, Kuwait (PIC) and Kuwaiti Private Companies, for the construction of an ethylene plant at their new Olefins-2 Petrochemical Complex in Shuaiba, Kuwait. The plant, with a production capacity of 850,000 mt/year, will play an important role in Kuwait's program to significantly increase the country's ethylene derivatives production by 2008. Technip's engineering center in Rome (Italy) will execute the contract, which includes detail engineering, procurement and supply of equipment and materials, construction and pre-commissioning. The project is scheduled to be completed early 2008. ■

SABIC selects Aker Kvaerner for expansion project

Ibn Zahr, Saudi European Petrochemical Company (an affiliate of Saudi Basic Industries Corporation – SABIC) has signed a letter of intent with Aker Kvaerner for the provision of program management services and basic engineering services, for its Ibn Zahr Polypropylene III project, located at its existing site in Al-Jubail, Kingdom of Saudi Arabia. Aker Kvaerner's project scope includes program management services and basic engineering services for the polypropylene (PP) expansion and the associated OSBL utilities and offsite facilities. A new polypropylene line will be built with a capacity of 500,000 tons per annum (tpa), nearly doubling its current capacity. The additional capacity is expected to come on stream in the second quarter of 2008. The plant will make use of Dow's UNIPOL polypropylene technology. Aker Kvaerner also currently has a significant involvement in-Kingdom through the Butanediol (BDO) project that is being executed for GACIC (Gulf Advanced Chemical Industries Company). This 75,000 tons per annum facility is currently in the advanced stages of construction at Al Jubail, with five million field man-hours worked without a lost time incident. Plant start-up is scheduled for fourth quarter, 2005. ■

Borouge awards PMC and financial advisory

The Project Management Consultancy (PMC) and Financial Advisor contract awards linked to a proposed major UAE expansion were announced by Borouge – Borealis' joint venture with the Abu Dhabi National Oil Company (ADNOC). It has awarded the PMC to Foster Wheeler and the Financial Advisory contract to HSBC. This follows the completion of the feasibility study for a construction project to triple the current production capacity in Ruwais, Abu Dhabi of 600,000 tons of polyolefins per year to 2 million tons. With an investment in excess of $ 2.5 billion and completion slated for 2010, the company expects to expand its annual production to include an additional 540,000 tons per year Borstar polyethylene plant and two 400,000 tons per year Borstar polypropylene (PP) units. The new capacity will primarily address Middle Eastern and Asian markets, targeting demand for high-end, differentiated pipe and enhanced packaging solutions. ■

The Borouge complex in Ruwais

Picture: Borealis

New development: 30% energy savings in the production of chlorine

Bayer MaterialScience has now developed a method to dramatically reduce electricity consumption in the production of chlorine by electrolysis of hydrochloric acid. The recently developed oxygen depolarized cathode means energy savings of 30% over the conventional diaphragm process. This new development by the Inorganic Basic Chemicals (IBC) Business Unit of Bayer MaterialScience together with their research partners from DeNora was singled out for the Industrial Electrolysis and Electrochemical Engineering Award. This prize is awarded by the American Electrochemical Society (AES) for outstanding achievements in the field of industrial electrochemistry. The SVK unit at Brunsbüttel was developed and brought to industrial maturity in a cooperation between Bayer and UHDENORA, a joint venture between UHDE, Dortmund, De Nora, Milan, and De Nora North America. For the first time a purely metal electrolytic cell with an ion-exchanger membrane was applied in hydrochloric acid electrolysis. It is intended to license and commercialize this new technology. ■

...help to keep the damage at bay

In the chemical and other process industries, where equipment reliability and durability have a vast influence on almost every industrial operation, over 60% of all mechanical failures are effectively due to corrosion. For these reasons it is all the more important to be able to navigate the flood of scientific technical information on materials and corrosion by an efficient use of information systems and databases. The new electronic version of the Corrosion Handbook on CD-Rom reflects the state of the art in research. Faced with the task of optimizing a given environment-material system, users will find answers to the following:

- Is there information available on the behavior of the material under consideration in a particular medium?
- Which materials are out of question for the proposed purpose?
- Which materials can be used without hesitation in the medium concerned?
- What are the conditions under which a less resistant, less costly material will give satisfactory service?
- Which material offers best performance for value under the given circumstances?
- What protective measures exist: inhibitors, coatings, cathodic protection, etc.?

The CD has a similar structure to the well-known Corrosion Handbook paper edition (7000 pages) but in a modern, carefully hyperlinked electronic form. The user can browse through the entire compilation of corrosion data. Furthermore, the CD features a very advanced full text search and an index based on key concepts. ■

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http://www.dechema.de/corrosion

News from the European Technology Platform for Sustainable Chemistry

The European Technology Platform for Sustainable Chemistry (SusChem) was initiated in 2004 to help foster and focus European research in the areas of chemistry and industrial biotechnology. The SusChem vision foresees a sustainable European chemical industry with enhanced global competitiveness and minimal environmental impact powered by a world-leading, technological innovative drive. It is mapping out a research route to achieve this vision. This will provide new cutting-edge solutions that continue delivery of chemistry's essential benefits in areas from energy and healthcare to construction and clothing. Three critical technology areas have been identified where progress is required: industrial biotechnology; materials technology, and reaction and process design. The work of SusChem will soon result in a Strategic Research Agenda (SRA) that will have a significant impact on chemistry research in the 7th European Framework Programme and beyond. The 3rd SusChem Stakeholder workshop on November 25th will finalize the SRA and start work on developing detailed implementation plans. ■

Further Information:
http://www.suschem.org

Process intensification: revolution versus evolution

Process intensification (PI) is one of the most significant developments in chemical and process engineering and is increasingly attracting the attention of the chemical engineering community. Process intensification with its ambition and ability to make chemical processing plants substantially smaller, simpler, more controllable, more selective and more energy-efficient addresses the fundamental sustainability issues of the chemical process industry and represents the core element of Green Chemical Engineering. Numerous PI-oriented research programmes are being carried out in many research centres throughout Europe.

In the U.K. and in the Netherlands national PI networks have existed for a number of years. A similar network was founded in Germany this year (DECHEMA). The scientific societies active in this field – DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V., VDI-Gesellschaft Verfahrenstechnik und Chemieingenieurwesen (GVC), and Forschungsgesellschaft Verfahrenstechnik e.V. (GVT) – have set up a joint Subject Division Process Intensification. At its founding session on September 7th, 2005 during the GVC/DECHEMA Annual Meetings in Wiesbaden, Professor Norbert Schadler, Managing Director of Siemens AG, A&D Solutions Process Industries and Chairman of GVC, stated that the rationale for this move was to consolidate and thus speed up activities in this field by close cooperation between science and industry. Process intensification also plays an important role in CEFIC's Technology Platform on Sustainable Chemistry. The time was also ripe for giving PI an organizational place within the European Federation of Chemical Engineering. A new Working Party on Process Intensification (WP PI) was founded in September 2005 on the occasion of the 6th International Conference on Process Intensification in Delft/The Netherlands. The aims of the EFCE Working Party on Process Intensification are:

- anchoring of PI technologies in the European chemical industry;
- education, dissemination and exchange of knowledge of PI;
- stimulating collaborative R&D projects;
- collaboration with other European organizations, such as CEFIC'S Technology Platform on Sustainable Chemistry;
- collaboration with similar initiatives in non-European organizations (e.g. AIChE, SCE Japan, CIESC China, etc.).

The EFCE Working Party on Process Intensification will closely cooperate with other EFCE Working Parties, e.g. WP Environmental Protection and Sustainable Development, WP Membranes, WP Loss Prevention and Safety Promotion, WP CAPE and Education. In the coming three years guidelines will include preparation of a technology roadmap for process intensification, organization of the next International Conference on PI in 2007, and several aspects of education as well as knowledge and technology transfer. ■

Further information:
www.dechema.de/prozessintensivierung
www.efce.org/wp