



Global PO&E

POLYOLEFINS & ELASTOMERS

Strategic News Analysis – As the Events Unfold!
Delivered to Your Desktop – Every Other Monday Morning

Volume 1 Issue 10 ❁ Comments By Dr. Balaji B. Singh ❁ May 5, 2003

Welcome to the Global Polyolefins and Elastomers Strategic News Analysis!

Welcome to "The Global Polyolefins & Elastomers – Strategic News Analysis" – another strategic service from Chemical Market Resources, Inc. for clients in the polyolefins and elastomers to help them succeed.

What will the service provide?

- ❁ Provide a concise quick-read format of the Global events related to polyolefins and elastomers - every other Monday Morning on your computer – with our comments.
- ❁ **What we Bring to the table** -A reference to the relevant analyses from Chemical Market Resources Inc. – New Generation Polyolefins – Bimonthly Review from the past 9 years (54 issues), over 40 multicient studies and numerous published articles all related to polyolefins and elastomers – There is no major event in polyolefins and elastomers in the past thirteen years that we did not analyze in-depth.
- ❁ Timely, in-depth special analysis of major events like impacting the polyolefins and elastomers industry..
- ❁ This is just a beginning! Just wait and see us improve with time!.

What is the methodology?



- ❁ We scan all of the Global resources on a daily basis to track current events and announcements
- ❁ We are registered with all of the major polyolefins and elastomers divisions of the Global organizations to get their

press releases.

- ❁ The analysis events are analyzed based on the wealth of strategic information we have in-house based on our 13 years of excellence in marketing research and strategic analysis for the Polyolefins and Elastomers Industry
- ❁ The new developments are summarized in an easy to read format, supplemented by our comments.

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Another Unique Service From

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◆ Nova Chemicals Launches metallocene film grade PEs – SURPASS

Nova chemical is launching four film grade resins – the first of its new high-performance PE resins under SURPASS trade name, produced with NOVA SCLAIRTECH technology using proprietary single-site catalysts. SURPASS resins deliver a unique combination of properties like toughness, tear strength, clarity and processability.

The grades include FPs 117-c and FPs 117-F, targeting for applications that require extra toughness. HPs 900 used for application that require clarity while maintaining puncture and tear resistance. FPs317 offers strength and clarity in cast applications such as stretch film.

Comments: Nova's SCLAIRTECH and Advanced SCLAIRTECH have made significant contributions to film markets with the superior technology, so far focused on Z-N and Advanced Z-N Catalyst technologies. This group of products will be the first offering of metallocene based resins from NOVA.

Side Comment: The name SURPASS was selected in keeping with the spirit of the previously introduced metallocene based PE resins from Dow and Exxon – Attane, Affinity, Exceed, Exact, Engage etc., Now try and SURPASS that!

We at Chemical Market Resources, Inc. have no AFFINITY to ENGAGE in any EXACT Science as to which resins will EXCEED the performance to SURPASS customer requirements to ATTA(i)NE the ultimate status ☺

◆ Last of Dow's ESI facility Disappears

Dow Chemical Company discontinued the development and sale of ESI (Ethylene Styrene Interpolymers) after operating a commercial plant with 50 million pounds a year in Sarnia and the planned 300 million pounds/year world scale plant.

The Sarnia ESI facilities which produced 50 million pound/year commercial quantities will now be used to manufacture INSITE based PE waxes for Marcus Oil and Chemical, Houston, Texas.

Comments: ESI is one of the greatest technologies that created tremendous stir in the industry in the past ten years – but did not meet its objectives. We have covered the ESI developments and issues as a part of our New Generation Polyolefins (NGP) Bimonthly Review several times.

◆ Asahi Kasei and AtoFina together at last in SB Copolymers

AtoFina and Asahi Kasei have confirmed their 50:50 venture in SB Copolymers. AtoFina's business is focused in Europe and North America while Asahi Kasei is concentrated in Japan/Asia. AtoFina is currently restructuring its business in Europe to cut costs.

Comments – AtoFina acquired the SB copolymers business from Phillips (Solprene) in the mid 1980s because of Phillips' conflict with Shell Chemical Company. AtoFina, a producer of SB rubbers produced unsaturated SB copolymers under the tradename "Finaprene". AtoFina could not fulfill its goals of producing SIS and SEBS, the coveted products of SB copolymer family due to lack of raw materials and technology. The competition for unsaturated diblock SB copolymers intensified with the entry of Enichem, Dexco and more recently Dynasol into the business. Shell withdrew from the business, currently run by the holding company – Ripplewood as Kraton Polymers.

There were significant developments in saturated diblock copolymers via alternate technologies including the one from Dow Chemical Company under ESI technology. Asahi Kasei and Kuraray developed diblock SB copolymers that approach the properties those of SEBS.

The FlexPO2003 program to be held Sept 17-19th in Houston includes an overview of the SB copolymer worldwide market developments and presentations from Kraton Polymers, Kuraray, Asahi Kasei and Chemical Market Resources Inc. on all aspects of SB copolymer markets.

The Enichem Elastomers America, part of Polimeri Europa is currently for sale. SABIC evaluated Polimeri Europa along with DSM for potential acquisition and opted on DSM. Following that, Polimeri Europa announced the whole organization will be sold as a piece or in divisions by themselves. Enichem Elastomers division with operations in North America and Europe produces rubbers and elastomers based on SB and polyolefins.

◆ Polibrasil and PKN start up polypropylene units

Polibrasil, a joint venture between Basell and Suzano (Rio de Janeiro) started up their 300,000 MT per year Spheriopol process PP plant at Maua, Brazil. The unit will use propylene from Petrobras' Capuava refinery at Sao Paulo.

Basell and PKN Orlen started operations of their 50:50 joint venture at Plock, Poland called Basell Orlen Polyolefins.

Comments – Basell's actual market share in the Global PP licensing market involves joint ventures as a common strategy compared to Univation. It is also interesting to compare the market shares of major polyolefin technology suppliers with and without the joint ventures. Basell leads the pack in PP including the joint ventures and Unipol (Univation) leads the pack excluding the JVs.

◆ Asahi obtains Metallocene rights from Dow

Asahi Kasei has obtained global marketing rights from Dow Chemicals for Creolex high density

polyethylene (PE), Creolex is manufactured using metallocene catalyst in a slurry process plant. This technology was jointly developed by Dow and Asahi. Asahi plans to modify a 50,000MT/year plant at Mizushima, Japan to manufacture Creolex and two other metallocene PE grades.

◆ Eastman cutss salaries as part of cost-saving effort

Eastman Chemicals cut salaries by 3% for the employees and up to 6% for its executives. The moves were attributed to Eastman's quest to reduce the costs by \$100 million in the first half of 2003 and counter the raw material price pressures.

Comments- Eastman continued unique developments in metallocene and gas phase catalysts for polyethylene. Eastman licensed BP's Innovene process, and as part of its research program developed the Energx™ catalysts which showed much better performance compared to BP catalysts. BP has recently signed an agreement with Eastman to license the Energx catalyst to their Innovene licensees. BP's Innovene process also signed an agreement with NOVA to develop NOVACAT system for the Innovene process.

The increasing cost pressures have made Eastman maintain a low profile. Eastman is one of the most innovative polymer producers.

◆ Borealis to reduce technical work Force

One of the major polyolefins producers Borealis plans to reduce one-fourth of its European Research and Development work force. Borealis' R&D activities are located in Europe at four different locations including: (1) Porvoo, Finland (catalysis and process research and Borealis' Borstar technology), (2) Roenningen, Norway (film & fiber markets), (3) Stenungsund, Sweden (pipe, wire & cable), and (4) Linz, Austria (engineering applications). The company plans to

eliminate about 150 technical and research jobs by the end of this year.

Comments: Borealis is a unique organization with multinational staffing and facilities. The first signs of the financial problems were apparent in the Borstar licensing organization. Borealis during 1998-2001 was considered a major organization with tremendous emphasis on polyolefins R&D (both catalyst and process). There is no polyolefin/catalyst organization in the world that has not either discussed or formed a joint development program in polyolefins, most recent include Equistar, ExxonMobil, Mitsui, Rohm & Haas among others.

The Borstar licensing program was suddenly discontinued due to financial problems.

◆ ExxonMobil awarded \$416 Million in dispute with SABIC

A Jury in Delaware Superior Court awarded ExxonMobil Chemical \$416 million in a contract dispute with SABIC related to the 50:50 PE joint venture in Saudi Arabia. The jury found that SABIC had overcharged the JV for the PE technology. The verdict included \$184 million in over charges billed and \$324 million in "damages". – Most of the details are confidential to ExxonMobil and SABIC.

◆ Japan fines three polypropylene producers for price-fixing

Japan's Fair Trade Commission (FTC) fined Japan Polychem 845 million Yen, Chisso 435 Million Yen and Grand Polymers (Div. of Mitsui) 760 Million Yen on charges of conspiring to fix prices for polypropylene in 2000 and 2001. The other PP players, Idemitsu, Sumitomo and Sunshine (Montell JV) and Tokuyama Soda are still under investigation for their activities during this period.

Comments – Please read our 2001 Japanese industry special issue of New Generation Polyolefins

that presents the industry the role of companies and government in the Japanese polyolefin industry.

The Japanese polyolefin industry is under tremendous pressure from the recent developments from China and Asia, which essentially reduced their export opportunities. Simultaneously, the reduction of tariffs on imported materials into Japan increased the pressure to be competitive within Japan. Japanese polyolefin market traditionally never differentiated the polyolefins into: commodities, specialties and differentiated commodities – due to the size and grade requirements. All of the polyolefins were always sold as specialties – the concept which is now under pressure with the imports from Asia.

◆ Sunoco Buys PP unit from Equistar; agrees on propylene supply deal

Sunoco announced it has agreed to purchase Equistar's 400 million lbs/year PP plant unit at Bayport, TX and has signed a 15-year 700 million lbs/year contact to receive propylene from Equistar's La Porte, Cracker. The PP plant is based on the old Rexene slurry-process and approximately 50% goes into fiber applications.

Equistar now has reduced its already low PP holdings to just one plant at Morris, IL based on Novolen PP process. It is unlikely that they will divest this unit because Equistar part-owns Novolen technology with ABB Lumus.

Comments: Sunoco will be a factor to recon with in North American polypropylene. See the detailed article recently sent by email and included with this issue.

Sunoco a combination of Aristech, Old plant, old Huntsman plant and the current Equistar plant will make them a cost effective supplier of polypropylene especially for the automotive applications.

◆ **BP to quit EVA manufacture; switches capacity to Extrusion Grade LDPE**

BP is in the process of ceasing to manufacture EVA copolymers at their BP-Koln subsidiary at Colgne, Germany, in the later part of 2003. The production will be switched to making extrusion grade LDPE (low EVAs). The High EVA copolymers (>10% VA Content), are mainly used in high performance films (10-15% VA), adhesives and sealants (18-23% VA) and VAEs.

Comments: Manufacturing the high EVAs on the high pressure LDPE unit decreases the capacity utilization and plant output. The impact of cost on per pound of product becomes significant and increases with the VA content. Most high EVAs are priced in the market as specialty value added polymers more than justifying the cost penalties.

However, the high EVAs are marketed separately from the low EVAs and require extensive technical services.

The low EVA High Pressure LDPE, commonly referred to as LDPE is widely known in the industry as survivor. Since the introduction of LLDPE in the mid-80s most polyolefin consultants forecasted the demise of LDPE. However, selected properties of LDPE (especially in the extrusion coating applications) and the newer tubular and autoclave technologies have made them cost competitive to other polyethylenes.

Please see approximately ten different articles by Chemical Market Resources, in the past 8 years that tracked the LDPE by markets and maintained the position that LDPE will not completely be replaced.

For further information ask for our newer multiclient study and the Licensing Fair Proceedings that discussed the LDPE markets and technologies in great details.

◆ **Sumitomo and Mitsui abandon merger plans – No impact on polyolefin operations**

Sumitomo Chemical Company and Mitsui Chemicals Inc. have scrapped their plans to merge following a recent change in share prices. Sumitomo's share prices was higher than Mitsui's when the merger was announced in 2000. The Mitsui's share price has overtaken that of Sumitomo. This major shift values the companies in a different situation.

Comments: This should however not affect the last year's 50:50 polyolefins joint venture between the two organizations. Sumitomo/Mitsui combination with JPO, JPC and the independents – Asahi, Idemitsu and Tosoh (all of them with oil company parentage) complete the picture of Japanese polyolefins and take them back to late 80s effective organizational groups under MITI supervision.

Most Japanese mergers & acquisitions are driven by the need for operational improvements to compete effectively against developing countries the Government's decision to lower the tariffs for imports.

◆ **Mitsui Elastomers plant start-up in Singapore for TAFMERS**

Mitsui Elastomers Singapore has brought online a 100,000 MT/year performance elastomers plant at Jurong Island, Singapore. The plant will produce Mitsui's Tadmers elastomers, an alpha-olefin copolymers with excellent blending characteristics. Approximately 30% of the production is targeted for Japan, 40% in Asia and the rest in North America and Europe. The company also operates a specialty elastomer plant at Chiba, Japan with the capacity of 100,000 Mtons/year. However, the plant was an all-purpose plant that made several other ethylene elastomers in addition to Tadmers.

Comments: TAFMERS, both A-Series and P-Series were introduced into North America and Europe in 1989 from 10,000 MT/ year pilot plant in Japan. TAFMERS were considered most superior products in the family of ethylene elastomers during that time and they became the bench-mark polymers for all the new elastomeric products produced using metallocene and advanced Z-N catalyst products introduced later.

Chemical Market Resources, Inc. has presented several analyses in the last 15 years on this product. The classical mistake committed by Mitsui in 1989 was introducing a superior product without adequate manufacturing capability, resulting in limited market penetration in North America.

◆ ExxonMobil to license PE Technology to Thai polyethylene

ExxonMobil has agreed to license its high pressure low-density polyethylene (LDPE) technology to retrofit Thai Polyethylene's ICI process plant at Map Ta Phut, Thailand.

The project will debottleneck the 90,000 MT/year capacity plant; improving product quality and expanding product portfolio to include ethylene-vinyl acetate. Thai Polyethylene is a subsidiary of Cemanthai Chemicals.

Comments: LDPE technology has come a long way from the capacity limited, high cost, high pressure reactors of yesteryears. The higher costs associated with equipment and maintenance combined with highly publicized performance improvements of LLDPEs have impacted the thinking of most consultants and organizations into LDPE disappearance.

We at Chemical Market Resources, Inc. maintained our position that LDPE will never be replaced by LLDPE for the last 15 years. With the new

developments in Higher Pressure reactors for LDPE that can meet and/or exceed LLDE capacities the fate of LDPE is forever changed. Not only will the LDPE never be replaced, but several metallocene technologies are focusing on developing LDPE look-alikes.

◆ China approves LG's PVC Plant

The State Planning Commission has approved a polyvinyl-chloride (PVC) plant at Quanzhou. The plant is a joint venture between LG Chemical and Fujian Petrochemical. The project includes a 160,000 MT/year chlor-alkali plant and a 450,000 MT/year PVC plant.

The PVC plant is LG Chemical's second in China. Tianjan LG Dagu Chemical, a jv with Dagu Chemical operates a 240,000 MT/year at Tianjan.

◆ Dow Chemical Company commercializes specialty Polymers line based on functionalized polyolefins

Dow Chemical Company has launched a new range of functionalized polyolefins. The products are from their PO&E Polyolefins and Elastomers business division.

The functionalized polyolefin family group of products include: (1) EEA copolymers, (2) selected EVA copolymers, and (3) MAH grafted copolymers.

The products are newest from the UCC-Dow acquisition based product expansion. Union Carbide already had the products based on EEA and EVA. Dow combined these products with the recently developed MAH grafted polymers to optimize and expand the markets beyond the traditional packaging applications.

Comments: The lack of polarity in the polyolefin back-bone has been one of the major short-comings of polyolefins. Acid copolymers, Ionomers, high EVAs and MAH grafted copolymers extend the basic polyolefin applications to include blending and adhesion to polar substances.

Please see our multiclient studies on: (1) Acid Copolymers & Ionomers, (2) Tie Layers and MAH grafted copolymers, and (3) Grafted Polyolefin New Development articles from our New Generation Polyolefins.

◆ ATOFINA Increases Polyethylene Production

ATOFINA has increased Polyethylene (HDPE) production capacity at its Antwerp plant in Belgium. The capacity was increased by 160,000 tons/year bringing the site's overall capacity to 510,000 tons/year. The increase in capacity will enable the Antwerp plant to produce new bimodal grades for various applications, resins from metallocene catalysts, and a wide range of colored resins for pipe, in addition to conventional resins.

The Antwerp Polyethylene plant accounts for 10% of Polyethylene (HDPE) consumption in Western Europe (13% when taking into account the Feluy plant, also in Belgium), and is the largest single production site for colored HDPE resins.

Comments: The bimodal pipe resin market has experienced healthy growth rates over the past few years, mainly due to regulatory changes and a push by the PE100+ Association for the use of higher performance pipe grades.

Please see our analysis of Bimodal technology current and future direction in NGP Volume 7 Issue 2.

◆ DuPont offers to buy DuPont Canada

Dupont has put up an offer to buy DuPont Canada for \$943 million which is 24% of the shares it does not

already own. The move is part of a plan to spin off DuPont Textiles & Interiors (DTI) unit by the end of the year. DTI is 38% of DuPont Canada's C\$2.47 billion 2002 sales.

Comments: Dupont of Canada was the original polyolefin part of DuPont. The polyolefin portion of DuPont of Canada was acquired by Nova Corporation – circa 1988 – Now Nova Chemicals. The SCLAIRTECH process of the old DuPont of Canada is the main technology platform of Nova Chemicals. Nova Chemicals has improved the SCLAIRTECH process to Advanced SCLAIRTECH with the Z-N catalyst system and now most recently with the metallocene catalysts. Nova Chemicals also formed catalyst development agreements with BP.

DuPont in the last five years has developed the VERSIPOL technology. DuPont after announcing the 500/500/500 patent in our FlexPO conference in 1997 at San Antonio, TX has not progressed it as much as people anticipated. We left to wonder what would have been the status of VERSIPOL developments if SCLAIRTECH was not divested ??

◆ Cryovac to open new facility in Arkansas

Cryovac a division of Sealed Air Corp has planned to open up a shrink film plant at Rogers site in Arkansas by beginning of 2004. The plant will consist of a new 165,000 square-foot facility.

The plant will extrude shrink film for food packaging application in poultry, pork and beef products. Cryovac has been one of most innovative organizations in keeping up with the new technologies and developing innovative film applications.

◆ A Schulman to Close TPO Plant in Orange, Texas

A Schulman, one of the first TPO compounders, is expected to close its Orange, Texas plant by end of

August. The move comes as a result of higher resin prices, competitive pressure and weak demand for value added engineered products.

The plant is 145,000 square foot with 60 million pound capacity. The plant produces black concentrates and thermoplastic olefin compounds for the automotive industry. A Shulman is North America's third largest compounder.

Comments: Compounders have also witnessed increased competition from reactor TPO products. Such products developed by the larger resin suppliers have been able to traverse down the value chain and capturing value from the compounder level. Reactor TPO products have made substantial gains in the roofing and automotive markets.

During the early 90s, TPO compounding became grounds for competition for dominance from compounders and resin producers. A Schulman, Republic and Dexter were the three most prominent TPO compounders in North America. Republic was acquired by Himont (now Basell) followed by Solvay's acquisition of Dexter Plastics. A Schulman the only surviving TPO compounder avoided being acquired by resin companies by reorganizing their units (poison pill).

◆ Kuraray to Expand EVOH in Europe

Kuraray has started work to double production capacity of its Eval ethylene vinyl alcohol (EVOH) copolymer at its Eval Europe subsidiary at Antwerp. The current manufacturing capacity of EVOH at this site is 12,000 MT per year and will be increased to 24,000 MT per annum. The expansion is scheduled for completion by third quarter 2004. Kuraray has a total EVOH capacity of about 45,000 MT at Antwerp, Belgium; Okayama, Japan; and Pasadena, TX.

◆ PetroChina to use Spheripol PP Technology

Basell Polyolefins has signed an agreement with PetroChina Co Ltd to license its Spheripol polypropylene technology. The total capacity in the agreement is 800,000 MTons/year at Daqing and Lanzhou PP projects each having a capacity of 300,000 MTons/year and the Dalian plant having a capacity of 200,000 MTons/year.

PetroChina is the largest integrated oil and gas producer in China. PetroChina business includes refining and production and sale of chemical products. China at present has highest growth rate for PP consumption.

Comments: Basell has been at the forefront of PP process and catalyst technology. In fact, the Spheripol process is responsible for over 35% of the global PP capacity base. Basell is also continually developing new PP catalyst technologies such as the diether and succinate systems to further differentiate their product/licensing offerings.

◆ Sinopec Expands Ethylene Output

Guangzhou Petrochemical Corp a subsidiary of Sinopec has completed an expansion of 85,000 MTons/year of ethylene at its ethylene plant. The addition will bring the total capacity to 200,000 MTons/year.

GPC will now be able to double its polyethylene capacity to 200,000 tons/year and raise its polypropylene to 100,000 tons/year from 70,000 tons/year.

Comments: Unlike many of the other regions, China's demand for polyolefins outstrips domestic supply. A significant amount is currently imported from countries like Korea, Saudi Arabia and Taiwan. In an effort to become self-sufficient, the Chinese have been expanding the domestic polyolefins industry with the aid of foreign equity-based joint ventures. Such arrangements have allowed the industry to capitalize on foreign capital as well as state-of-the-art technologies.

◆ Use of PP to Manufacture Water-Repellent Coatings

According to researchers at Kocaeli University, they developed an easy and cost effective method to make a superhydrophobic water-repellent coating from isotactic polypropylene (iPP). The process utilizes a solvent processing step to form a gel-like iPP coating. The rough surface of this coating mimics that of the water-repelling lotus-leaf.

Comments: Development of Breathable, waterproof membranes and coatings have been the quest for PP film suppliers for the last one decade. The overall objective is to develop a poor man's GORTEX – that is based on biaxially oriented Teflon films that created holes in the film that are large enough for the sweat beads to get out, but small enough to prevent water droplets.

The PP film producers (CT Films and Amoco) attempted to do the same with the PP film. CT Films' process involved making the holes with a braided wheel, which Amoco attempted to selectively dissolve certain crystal sites in the PP film via solvent treatment process. Both have successful products in the market.

The new process essentially turns this into a coating that can be applied to fabrics – a poor man's waterproof blue jean vs. Gortex jeans that cost a bundle.

◆ BP to focus on fewer chemicals

BP has decided to concentrate on seven key chemicals specifically acetic acid, acrylonitrile, ethylene, high-density polyethylene (HDPE), paraxylene, polypropylene (PP), and purified terephthalic (PTA). These products with propylene account up to 70% of the total chemical business.

Comments: The recent raw material cost pressures and the anticipated lower returns from the downstream operations have forced several oil company owned chemical divisions to re-evaluate their chemical operations. The trend started with Shell Oil, followed by DSM is now continuing to BP.

◆ Cargill to Concentrate on Bio-based Chemicals

Cargill is planning to concentrate developing specialty chemicals, polymers, and other industrial products made from renewable agricultural commodities. The development will be headed by Jim Stoppert, the senior director of industrial product development. Mr. Stoppert had served as president of Dow Cargill, the 50-50 JV Dow Chemical and Cargill that produces polylactic acid.

Comments: Dow-Cargill is the best example of a combination of a chemical company and a traditionally agricultural product company developing biodegradable plastics based on Polylactic Acid.

We have reviewed the technology extensively in the past New Generation Polyolefins Issues.

◆ Tredegar to add PP Film line

Tredegar Film Products is set to add a cast polypropylene film line at its Pottsville plant. The line is expected to be operating in the fourth quarter. The move is in response to growth in coextruded masking film (normally used for surface protection during delivery, fabrication and installation) and other markets.

Comments: Tredegar's cast film applications include food pouches, medical pouches, candy wraps

and laminations. Tradegar films has five plants in the United States, two in South America, three in Europe and two in China.

Chemical Market Resources has completed a PP film multiclient study that gives a detail analysis of the global PP film industry.

◆ **SABIC to acquire full ownership of StaMax BV**

SABIC Euro Petrochemical is set to acquire Owen Corning's 50 percent share in StaMax BV. Under the agreement SABIC will manufacture StaMax P composite under license from Owen Corning and will have exclusive production and sales rights in the European Market.

StaMak BV was a joint venture formed in 1999 between Owens Corning and DSM NV to manufacture StaMax[®] P, a light weight long glass Fiber polypropylene composite material. StaMak P end use applications include front end modules, door panels and other structural components in the automotive industry.

◆ **Oriental Petrochemical Company to double PP capacity in Egypt**

Oriental Petrochemical Company (OPC) is set to double its pp capacity. OPC currently operates a polypropylene plant with an installed production capacity of 160,000 metric tons per year.

Oriental Petrochemical Company built Egypt's first polypropylene plant and uses Unipol PP process technology.

◆ **Indonesian Polyethylene producer, PT Peni sold**

PT Peni, the Indonesian polyethylene producer got sold to a local group Indika for \$50 million. British

Petroleum (BP) was a major share holder owning 75% of the company. The other owners include Sumitomo and Mitsui, both having 12.5% ownership. The plant has a 450,000 tons/year capacity and is located at Merak in West Java. The plant uses BP's innovene gas phase technology.

PT Peni manufactured the full range of HDPE and LLDPE resins primarily serving the local Indonesian market.

◆ **Huntsman to build World's largest LDPE plant in UK**

Huntsman is to build a 375 – 400 thousand metric tons/year LDPE plant in Wilton, Teeside UK, which would be the largest in the world. The company is discussing the project with three providers of technology and expects to come to a final decision by the end of April 2003. The main LDPE technology providers include: (1) Basell, (2) Equistar, (3) ExxonMobil, (4) Polimeri Europa and (5) Sabtec.

Comment: Chemical Market Resources, Inc. organized a licensing fair in 2002 presenting all of the major LDPE technology suppliers in the world.

Chemical Market Resources, Inc is currently in the process of completing the worldwide LDPE markets, technologies and trends multiclient study.

◆ **Dow Announces Agreement to Supply PE Waxes to Marcus Oil & Chemical**

The Dow Chemical Company has entered into a commercial agreement to supply PE waxes based on INSITE technology to Marcus Oil and Chemical, Houston Texas. Marcus will market and sell 100% of the PE wax produced by Dow under the agreement.

Metallocene technology brings major improvements to PE waxes – traditionally considered recovered products.

◆ ABB Unit Files for Chapter 11

ABB subsidiary Combustion Engineering filed for Chapter 11 bankruptcy protection as a part of its attempt to resolve asbestos claims. Combustion Engineering is involved in the manufacture of industrial boilers insulated with asbestos. The company has offered a \$1.2-billion settlement plan that has been approved by 103,000 of its 138,000 asbestos claimants. ABB Lummus Global, a division of ABB is a licensor of Novolen PP technology.

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**Example of the review
of the Latest Events.**



EQUISTAR SELLS ITS BAYPORT POLYPROPYLENE UNIT

A CMR Inc. Analysis

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INTRODUCTION

On March 27, 2003 Lyondell Chemical Company announced that its joint venture Equistar Chemicals, LP, was entering into a long-term propylene supply arrangement with Sunoco, Inc. and is selling its Bayport polypropylene manufacturing unit in Pasadena, Texas, to Sunoco. The transaction will be effective as of March 31, 2002. Beginning April 1, 2003, Equistar will supply propylene to Sunoco for a period of 15 years. Equistar will supply a total of 700 million pounds of propylene to Sunoco; 500 million from the La Porte partnership and 200 million pounds based on a long-term contract. The price will be determined based on a cost-based formula.

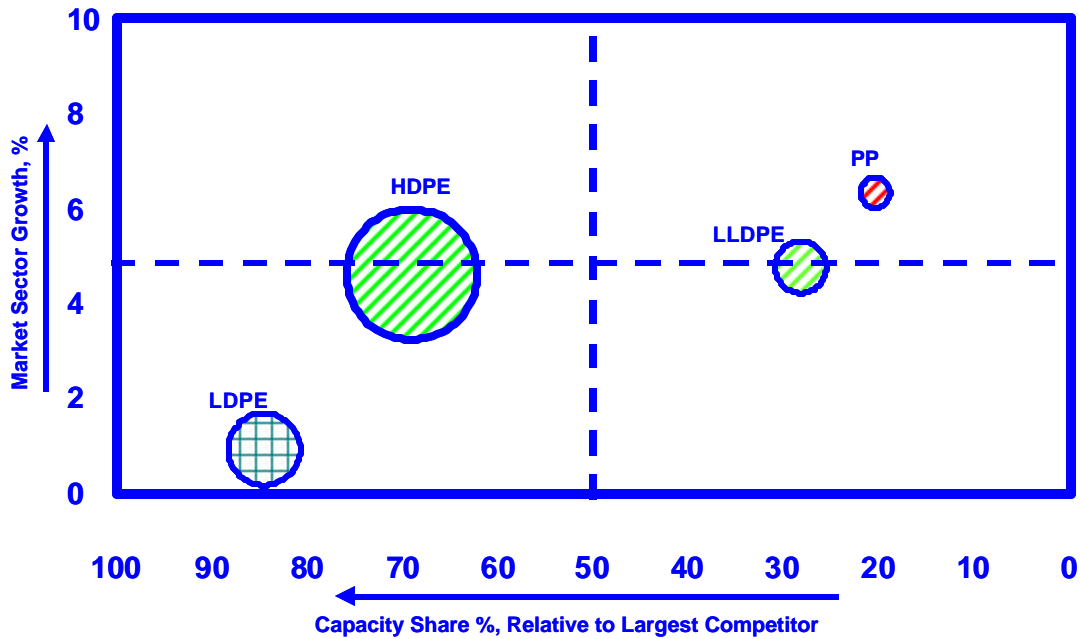
Equistar will retain the ownership of its Bayport low-density polyethylene unit as well its Novolen-based polypropylene manufacturing plant in Morris, IL. Sunoco will operate both the PP and LDPE unit at Bayport. The total value of the transaction for Equistar is \$190 million plus the value of the Bayport polypropylene inventory.

RATIONALE FOR EQUISTAR

Equistar is one of the largest producers of polyethylene while polypropylene is a very small part of its overall business. The growth share matrix analysis for Equistar conducted by Chemical Market Resources, Inc., clearly suggests that Equistar is one of the leading suppliers in both HDPE and LDPE markets. Their involvement in LLDPE is small but provides opportunities for future expansion with newer technologies. However its involvement in polypropylene is negligible and has less synergy with the rest of the organization. Chemical Market Resources, Inc., in 1997 expressed its opinion by stating that its polypropylene unit is a likely candidate for divestment, in the August/September 1997 issue of its bimonthly periodical *New Generation Polyolefins*. The issue also provides an overview of the Lyondell-Millennium joint venture.

The current divestment of the polypropylene unit will help Equistar: (1) focus on its core polyethylene business and (2) enhance liquidity by cash received through the transaction. Equistar will be able to achieve these benefits without impacting its propylene business as it has acquired a 15 year contract for supplying propylene to Sunoco

Growth Share Matrix of Equistar Chemicals



Note: Bubble diameter is proportional to capacity

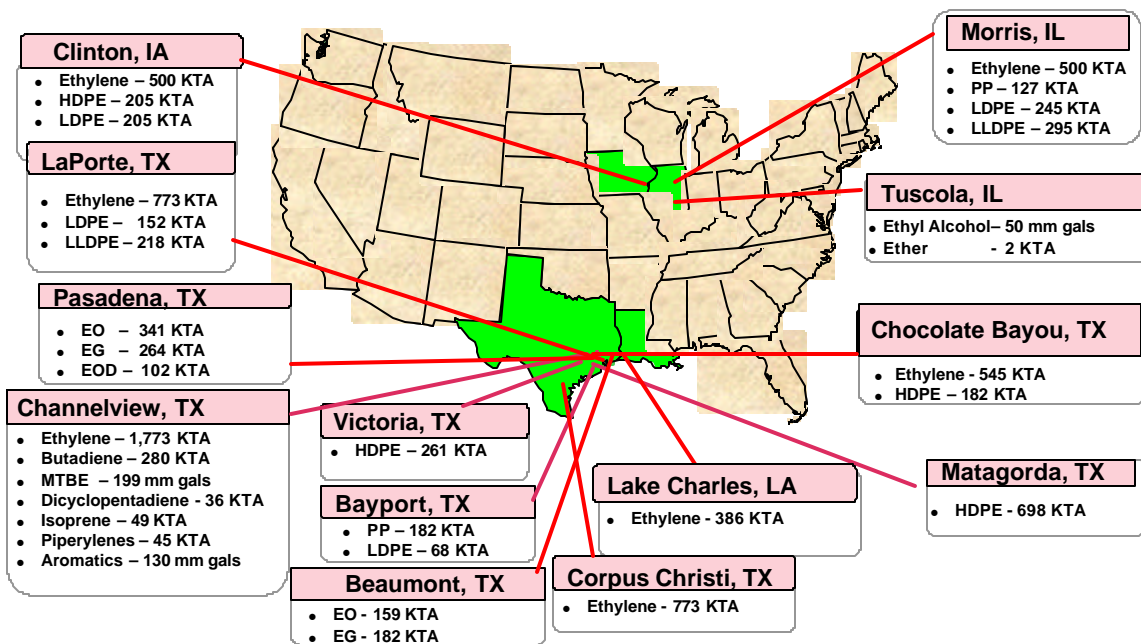
Source: Chemical Market Resources, Inc. based on Industry Data

In our opinion the reason why Equistar's plant in Morris, IL was not a part of this deal is because the newer Novolen plant provides them flexibility to provide differentiated products, due to its gas phase operation and silica supported catalyst. Its silica supported catalyst is metallocene ready which provides Equistar with the competitive edge to be prepared for the newer technologies. Another reason for not selling this plant is Equistar's 20% stake in the licensing of the Novolen technology.

Equistar was formed with the joint venture of Lyondell Petrochemical and Millennium in December 1997. Lyondell has 57% stake while Millennium has the remaining 43% stake. Equistar is a major producer of ethylene, propylene, and polyethylene with facilities in Texas and Illinois. Equistar had polypropylene facilities in two locations; a 400 million pound facility in Bayport, TX and a 280 million pound facility in Morris, IL. The exhibit below presents an overview of all the plants and capacities for Equistar.

RATIONALE FOR SUNOCO

Sunoco outlined their strategy of strengthening its polypropylene position. This was demonstrated by its acquisition of: (1) Aristech in 2001 and (2) taking control of Epsilon in 2001. The acquisition of Equistar's polypropylene seems to be one more step towards solidifying Sunoco's position in polypropylene. Sunoco currently operates an 800 million



pounds-per-year polypropylene plant at La Porte, TX, as well as polypropylene facilities at Neal, WV and Marcus Hook, PA. This acquisition enhances Sunoco's position as one of the largest North American polypropylene producers, with an operational capacity of 2.5 billion pounds. Sunoco considers propylene integration as a key success factor for PP markets.

In addition, Equistar is offering a price guaranteed discount to Sunoco of 4 cents over Gulfcoast economics (naphtha plus operating costs), with a 50/50 split for margins above 4 cents. The price discount is sufficient to provide a payback in 4 years. Visit www.Suncoinc.Com to get the detailed presentation on the margin analysis

Please read our analysis of SUNOCO A New PP Leader in the Making in our next New Generation Polyolefins Bimonthly Analysis..,

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