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2008 Technology Review

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PolyOlefins Planning Service (POPS)
2008 Technology Review

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CHEMSYSTEMS – a brand owned by Nexant, Inc. that provides support to decision makers in the petroleum, chemical and petrochemical industries

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SECTION 1.

Introduction to the Program

The Program

The ChemSystems PolyOlefins Planning Service (POPS) program has provided the most detailed, accurate and insightful analysis, of the global polyethylene and polypropylene business since its first publication in the 1990s. The service is regarded by many in the industry as the definitive analysis and forecast program for polyolefins. By means of an annual Executive Report, Quarterly Business Update reports, three special topic reports per year plus a separate, tri-annual Technology analysis, the program delivers a comprehensive analysis of the industry.

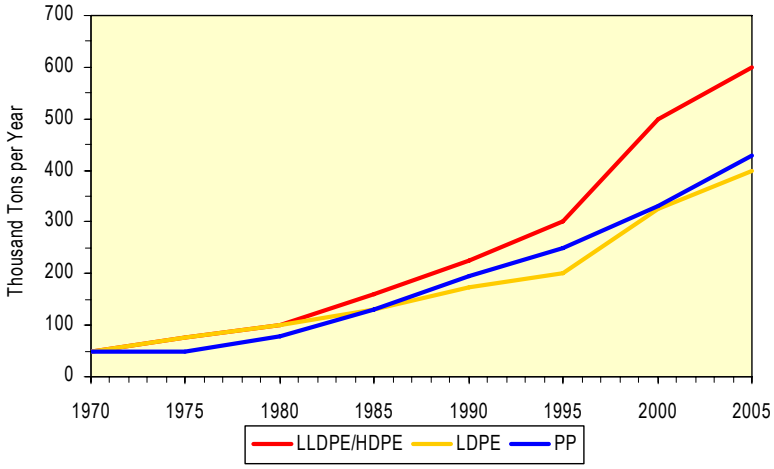
The Technology analysis (covered by this prospectus) is developed by Nexant's polyolefins consultants in consultation with all major polyolefins licensors. Detailed, non-confidential information for each key polyolefins technology is summarised in a profile and reviewed with the appropriate licensor. The profiles form the basis of the report and include a description of the technology and cost of production estimates.

The commercial analysis in the program is developed by Nexant's polyolefins consultants based on detailed research and field work for all global regions. The forecasts are developed using Nexant's ChemSystems Simulator, the state-of-the-art simulation model of the global petrochemical industry, ensuring that the forecasts are compatible and integrated with forecasts for olefins and competing commodity plastics. Subscriptions to the ChemSystems Simulator are also available allowing subscribers to develop private scenarios and forecasts.

Key Technology Issues

Three primary forces drive technology development: product performance, process technology, and process chemistry. Product developments include developing resins for new applications, replacement of other materials, and improving the resin for a given application. Process developments have focused on increasing plant scale (as shown in Figure 1), reducing plant cost, and the evolution of new technologies, such as BORSTAR from Borealis, SPHERIZONE from Basell (now LyondellBasell), and PRODIGY bimodal HDPE from Univation in recent years. Process chemistry developments focus mainly on catalyst systems - brand-new catalysts, modified formulations, and increased yield.

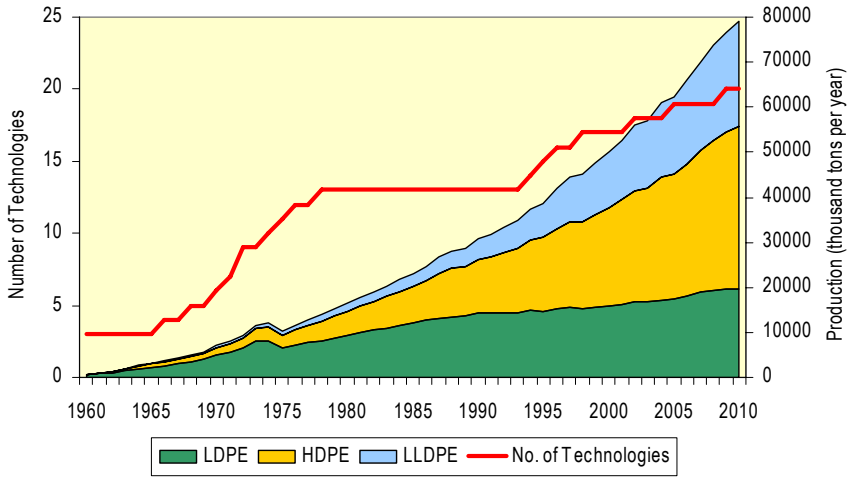
Figure 1 Single-Line Plant Size



POPS 2008 Technology Review Prospectus.xls\Line Capacity

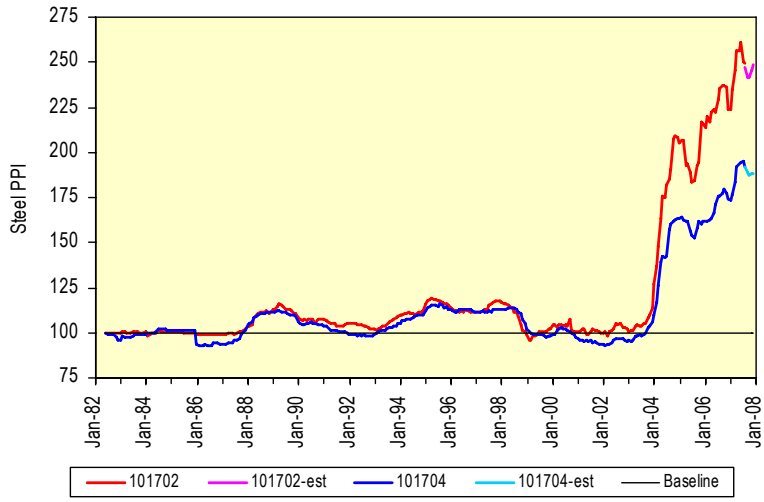
In addition to continual process improvement, many other issues face the polyolefins industry with regard to technology. Industry consolidation has led to less third-party licenses being available, while increased plant scale (as shown above) has reduced the number of individual licenses that are available. At the same time, the number of technologies available for license has also increased, as shown in Figure 2. This is the result of not only brand-new technologies, but some companies are now licensing their version of a previously licensed technology due to expiration of patents and license agreements.

Figure 2 Polyethylene Technologies for License



An additional concern for both licensors and licensees is increased costs, as illustrated by the price of steel (Figure 3), and project delays. Anything that a licensor can do to simplify their process and reduce the amount of steel used will have even more of an impact in the current economic environment

Figure 3 Steel Prices



POPS 2008 Technology Review Prospectus.xls\Steel Prices

Source: U.S. Department of Labor, Bureau of Labor

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SECTION 2.

Value of the Program

The POPS Technology report remains an industry benchmark for polyolefin technology, and presents Nexant's analysis of developments in polyolefin technology, and how these changes are likely to affect the polyolefins business.

Last updated as part of the POPS 2004 program, this fully revised and updated report provides a review of technology developments over a very dynamic period and significant advancement across a range of technologies.

The analysis includes technology-by-technology cost benchmarking, plus descriptions of the latest enhancements and developments for each technology. Each major licensor in the industry is contacted and encouraged to review and update their information. Every technology profile is revised with the most recent information and data publicly available.

The POPS program is used by, among others, Business Managers, Corporate and Business Planners, Industry Analysts, and Investors to understand the dynamics of this global business so that they may improve business performance and shareholder returns. The POPS Technology Review report is valuable enhancement to the recently published 2007 POPS program and the 2008 POPS program that will begin publishing later in 2008.

This report is essential reading for companies contemplating new investments, companies concerned over their competitive position, and companies involved in technology provision. Selecting the correct technology to strike the correct balance between scale, flexibility, and differentiation to exactly match market requirements requires considerable insight. The POPS Technology Review provides the key to appropriate technology selection. It is more important than ever for companies to have clear strategic direction in the polyolefin technology area.

Polyolefins Producers

Most of the global and regional polyolefins producers subscribe to the POPS program, relying on it to provide detailed market analysts and forecasting. In the complex world of polymer substitution, a reliable source of market forecasts is valuable and provides competitive advantage.

Polyolefin Consumers

Processors and component manufacturers need a sound understanding of their suppliers and the polyolefin industry. POPS provides the global benchmark for supply and market development.

Financial

The financial community has a need to understand polymer markets both through its role in project financing of polyolefin projects and in trading of polyolefin company bonds. The introduction of polymers futures on the London Metals Exchange has brought banks into the polymer business as traders of polyolefin paper.

SECTION 3.

Scope and Description of the Program

The POPS program provides analysis of the technical and commercial polyethylene and polypropylene industries. The three polyethylenes: low density polyethylene (LDPE), linear low density polyethylene (LLDPE), and high density polyethylene (HDPE), and polypropylene (PP) are analysed. The Technology Review report is a valuable enhancement to the annual program.

The Technology Review report will cover all major licensed technologies as well as some technologies that are not licensed but are important to the polyolefins industry. The technologies covered include:

- **LDPE** – tubular and autoclave processes
- **LLDPE/HDPE Swing** – gas phase, solution, and slurry loop processes
- **HDPE (Dedicated)** – Ziegler slurry and gas phase processes
- **Polypropylene** – gas phase, bulk, and improved slurry processes

The discussion for each technology will cover:

- **Recent Developments** including company news, new products, and new licenses
- **Background** including list of plants employing the technology and process history
- **Process Description** including simplified process flow sheets

In addition, **Cost of Production** economics (including capital and operating costs) will be presented for each technology discussed.

The annual POPS program has been structured to meet the information and analysis needs of our subscribers and to reflect the changing nature of the industry. Subscription to the program is corporate, allowing as many employees access to the data and reports as required. Each annual program provides timely topical data and valuable insights with commercial and technical information to support your company's competitive positioning in the industry. This consists of the following:

- **An Annual Executive Report** covering commercial aspects of the global polyolefins business (LLDPE, LDPE, HDPE, polypropylene and second generation technology products). This includes global, regional and country-by-country supply, demand, net trade, production, and operating rates.
- **Quarterly Business Updates** (QBUs) provide an executive level analysis of key developments in the polyolefins industry. The reports include data reflecting quarterly demand, trade and pricing for selected regions, an updated table of new capacity additions, and a listing and assessment of important industry events (mergers, acquisitions, outages, etc.). Special topics of interest and strategic importance to the polyolefins industry are also analysed in each QBU. These are published in the month following the close of each quarter.
- Three **Supplements** are provided covering in-depth analysis of key issues and developments that will likely impact the polyolefins businesses. Past topics have included: Metallocenes, Regional Cost Competitiveness, Latin America Update, Thermoplastic Polyolefin Elastomers, Middle East Update, and Alpha Olefins.

SECTION 4.

Costs and Subscription

The cost of the POPS 2008 Technology Review report is US$15,000. This report is priced separately from the main POPS 2008 program. All amounts are net of all local taxes, duties, and other applicable charges. Companies will be invoiced upon authorization payable within 30 days of receipt of the invoice. POPS 2008 Technology Review can be ordered using the form provided with this prospectus or online at our web site: www.chemsystems.com. Additional contact details are provided in Appendix B.

APPENDIX A.

Subscription Terms and Conditions

This Subscription Agreement (this "Agreement") is by and between the undersigned (the "Subscriber") and Nexant, Inc. ("Nexant"). Pursuant to this Agreement, Subscriber will purchase the ChemSystems PolyOlefins Planning Program (POPS) Technology Review 2008 report (the "Subscribed Report"), produced by Nexant in accordance with the following terms and conditions.

1. Subscribers to the Subscribed Report will receive two (2) copies in published form and access to the Subscribed Report via a password-protected area from www.chemsystems.com. All rights and limitations described above apply equally to hard copy and electronic versions of the reports. All amounts invoiced are net of all local taxes, duties, and other applicable charges. Additional published copies of the Subscribed Report are available at US$500 (five hundred U.S. dollars) each.
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9. A person who is not a party to this Agreement shall have no right under this Agreement.
10. This Agreement will be governed by the laws of the State of New York, United States of America.
11. By signing below, Nexant and Subscriber agree that this is the complete agreement between them regarding the Subscribed Report. No change, modification, extension, termination or waiver of this Agreement, or any of the provision herein, shall be valid unless made in writing and signed by duly authorized representatives of the parties.

APPENDIX A. **Subscription Terms and Conditions**

If the foregoing terms are acceptable, please sign below to confirm subscriber's agreement and return to Nexant.

AUTHORISATION

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