While the governments of the Middle East have been much in the political news in recent months, the region’s plastics industry has also been making news, with the start-up of additional petrochemical capacity and announcements of even more to come, as well as the buildup of additive supply and polymer parks and innovation centers focused on downstream processors.
The plastics industry in the Middle East can be said to have started in the 1980s with the construction of petrochemical plants designed to take advantage of readily available feedstocks that are byproduct of the region’s oil production. Petrochemicals production in the region has continued to expand, with several polyolefin producers starting up plant expansions in the last two years and more planned for the near future. Market research and polyolefin consulting firm Townsend Solutions (Houston, Texas, USA), which was scheduled to publish its annual global report on polyethylene (PE) and polypropylene (PP) last month, estimates that annual polymer production in the region will grow from just over 24 million tonnes in 2011 to nearly 34 million by 2016. Borouge, a joint venture between the Abu Dhabi National Oil Company and Austria-based Borealis, for example, tripled its annual polyolefin production in Abu Dhabi to 2 million tonnes in 2010, and plans to introduce an additional 2.5 million tonnes of annual capacity by mid-2014.

In the last ten years, regional governments have initiated and funded growth of the plastics industry in a new direction—downstream of polymer production. The Gulf Petrochemicals & Chemicals Association (GPCA) says that currently, out of 25 million tons of plastic resins produced in the Gulf annually, close to 3 million are converted into finished and semifinished industrial and consumer plastic products, and that the Gulf Countries are eager to see more local processing. Industrial centers such as the Abu Dhabi Polymer Park in the United Arab Emirates (UAE) (http://polymerpark.com) and the Rabigh Conversion Industrial Park (www.rabighcip.com) in Saudi Arabia are designed to attract foreign investors to build world-scale processing facilities that will market significant portions of their products to local markets. Both investment in the parks and local consumption of downstream products have been growing more slowly than hoped, partly because of the global recession, says David Anderson, business director of Global Polyolefin Solutions at Townsend Solutions. Osama Al Zamil, general manager for corporate business development of the Saudi-based Zamil Group Holding Co., which owns several companies in the downstream polymer processing industry, agrees that growth on the converting side has been slow. From his perspective, part of the problem is that the market for specialty polymers is not growing locally, and that local converters don’t have access to markets in Europe and North America. However, Anderson says, local consumption may come, noting, “Growth rates that had been down in the last couple years are back up to between 8% and 9% for both PE and PP, and the potential is there.”

Governments hope that growth in plastics processing will stimulate economic growth in the region and create employment opportunities for the growing population of underemployed young people. One source, for example, estimates that 65% of the employable population in Saudi Arabia is under 30 years old. This large demographic group is itself fueling consumption of plastics, as young people increasingly purchase cell phones, computers, and many more of the modern conveniences available in the developed world. The Middle East is also seeing urbanization, as young workers move from rural areas to the cities, seeking work in industry. Urbanization drives growth in housing and all types of infrastructure, causing growth in plastics applications like vinyl window profiles, pipes, and wire and cable. Upcoming projects such as stadiums and related infrastructure for the 2022 FIFA World Cup tournament in Qatar will add to demand.

Infrastructure is, therefore, a major growth market for polyolefins in the Middle East. Packaging also continues to be a key market, both for local use and for exporting to China and India. Borouge says advanced packaging is a growing area for polyolefins, in applications like coextruded and laminated structures, shrink films, and greenhouse films. Townsend’s Anderson notes that while primary food packaging is not yet widely established, it is expected to grow in the future as processors of packaged “convenience” foods come into the region.

**Compounded and engineering resins beginning to grow**

As more technical applications like pipe, wire and cable, and rotomolding take off, manufacturers are looking beyond polyolefin resins, which have been the staple here, to compounded and engineering resins. Saudi Basic Industries Corp. (SABIC) and ExxonMobil recently announced that their joint venture to produce synthetic rubber and thermoplastic specialty polymers in Jubail Industrial City, Saudi Arabia, has progressed to the front-end engineering and design stage. Industry watchers anticipate greater capacity for a broader range of polymers in the coming years to supply the growing downstream industry.

Growth in more technical applica-
Clariant Masterbatches’ plants in Saudi Arabia and Pakistan started up in 1993 to produce Clariant’s range of additive, color, and black and white masterbatches. Luigi Taglioretti, head of IMEA [India, Middle East, Africa] for Clariant, comments, “Local plants and application labs allow Clariant to offer both quick delivery times and customer support. We can also source carrier resins locally to help minimize coloring costs for customers.” Clariant says that infrastructure growth will continue to create unprecedented demand for color and additive masterbatches. Polymer fibers for textiles, which have a long tradition in the region, also continue to be a strong market.

Other growing uses for masterbatches include consumer goods and packaging, as locally made products replace those imported from outside the region, and eventually will support exports as well, says Taglioretti. He notes that Clariant has already increased capacity in both its Middle Eastern plants in anticipation of growing demand. Clariant is promoting its CESA UV stabilizer masterbatches to protect plastics such as cables or stadium seats from the

Spectators welcome. Qatar expects to host the FIFA World Cup football (soccer) tournament in 2022. Photo courtesy of Clariant.
region’s harsh climate conditions. The company also sees growing use of its pelletized anti-termite masterbatches, which have many advantages over widely used insecticidal oils. “Pelletized masterbatches reduce inventory costs because it is not necessary to maintain a stock of oil-treated PVC along with the untreated compound. The masterbatches are easy and safe to handle, reducing [concerns about] employee health and pollution, and it is easy to control the total amount of additive used to meet specific customer needs,” says Taglioretti.

In June 2010, Cabot opened a plant for manufacturing black masterbatch in the Jebel Ali Free Zone in Dubai in the United Arab Emirates (UAE). Sean Keohane, vice president and general manager for Cabot’s Performance Segment, explains, “Within the Middle East there is already a strong demand for polyethylene and polypropylene compounds for use in building infrastructure for water supply, electricity, and telecommunications projects. These are key applications for black masterbatch. This new site offers significant quality and service advantages to Middle East producers who are global exporters of compounds.”

Meeting the needs of the growing compounding industry

A growing compounding industry also means growing use of additives, minerals, and compounding equipment, and global suppliers are taking notice. Coperion, which recently signed an agreement to build the materials-handling and compounding system for Borouge’s upcoming polyolefin plant expansion, also plans to form a joint venture with Saudi Arabian company Golden Wing. The JV, Coperion Middle East, will optimize customer service with faster response times and replacement parts for compounding customers, as well as offering project execution, says Coperion.

Testing-equipment supplier Dynisco recently announced that it would hire new managers in the Middle East to work more closely with existing distributors and customers, learning their requirements and developing products and services that meet the unique needs of the region. “The market in the Middle East is not as well developed as that in Europe, but the potential exists for very strong growth over the next five to ten years, and we want to position ourselves to catch that wave of development,” says Lorenz Kirberich, sales manager for Dynisco Plastics Segment in Europe.

Additives producer Chemtura’s joint venture with the Saudi Zamil Group Holding Company, Gulf Stabilizers Industries (GSI), began production of antioxidants and additive blends in 2001. In April this year, GSI started up an expansion that increased phenolic and phosphate antioxidant capacity to 6000 tons and almost doubled the plant’s capacity for non-dust blends (NDB™) to 16,000 tons.

Chemtura’s NDBs offer a solid “powder-free solution” that has a strong position in hot Middle Eastern climates, where powdered additives are particularly difficult to handle. The non-dusting, free-flowing prill can contain standard or custom blends of up to seven additives, including phenolic and phosphate antioxidants and UV stabilizers, for example.

Another product long favored by many players in the polymer industry is liquid phosphite antioxidants, which
are easy to handle and dose. Chemtura is in the process of launching its new liquid phosphate antioxidant, Weston 705. This new technology will also be used to make a series of different phosphate and phenolic antioxidant blends. “These liquid blends will use the feeding systems already in place for liquid phosphites, and will replace both the individual phosphate and the powdered phenolic, offering significant benefits to polymer producers in the Middle East,” says Peter Smith, president of Chemtura’s antioxidant and UV stabilizers business. GSI plans to add capacity for liquid antioxidants as well as another 8000 tons/yr of NDB blends in the near future.

“Significant expansions of polyolefin facilities, as well as expected growth in the compounding industry, are driving demand for these antioxidants,” comments Smith. He adds that growth in the region’s compounding industry is also expected to drive demand for other additives such as flame retardants.

Dow Plastics Additives, which has been involved in the Middle Eastern market for over 30 years, opened a manufacturing facility in Gebze Kocaeli, Turkey, in January 2009. The plant has a nameplate capacity of 40,000 metric tonnes of acrylic impact modifiers used in building and construction applications. While it primarily serves the growing domestic Turkish market, it is also geographically well-positioned to serve Russia and the other CIS countries as well as the Middle East. The impact modifiers produced in Gebze were specifically developed to meet the needs of customers in these regions, and had been sourced from Dow’s plant in France before 2009.

“Most processors here are relatively new and often lack sophisticated processing technology, so they need a robust additive that allows a broad processing window,” explains Robin Madgwick, business market manager for Europe, Middle East, and Africa. He adds that although the end markets are relatively new, consumers here demand top quality, and the Dow impact modifier helps processors meet that need. Because of high market demand for Dow’s product, the Gebze plant has already filled the capacity of one of two production lines, and is preparing to start up the second line in the near future, says Madgwick. He notes that although the Middle East building market doesn’t use much vinyl siding, it has a large and growing market for PVC window profiles. Dow also sees growing use of both tin-based and non-
heavy-metal heat stabilizers, lubricants, and impact modifiers for a range of plastics applications including packaging.

Additives supplier BASF is also strengthening its presence in the Middle East to support the growing regional polymer industry. BASF currently supplies customer specific antioxidant blends (CSB) to the Middle East through a tolling agreement with Saudi Arabia’s Astra Polymer Compounding Co., Ltd., as well as through other global production facilities. In October 2010, BASF announced plans to build a production facility for CSBs in Bahrain, and is currently in the final planning stages. “With the new production facility, in addition to our tolling agreement, we will be able to support the fast growth of our customers in the Middle East region while providing the flexibility in supply and service speed that our customers require,” says Hans W. Reiners, president of BASF’s performance chemicals division.

Tokyo-based additives supplier Adeka recently announced acquisition of a 49% stake in Al Ghurair Additives (Dubai, UAE). The renamed Adeka Al Ghurair Additives is building a plant in Abu Dhabi Industrial City, scheduled for completion.

### GPCA Recognizes Innovators

In April, the Gulf Petrochemicals & Chemicals Association (GPCA) recognized several companies and individuals with its inaugural GPCA Plastics Innovation Awards, sponsored by the Saudi firm Tasnee, at a ceremony in Dubai.

Green Vision (Saudi Arabia) won the award in the Plastic Products category for an “eco-friendly turf system” that was developed to replace real grass in regions affected by droughts.

Zamil Plastics (Saudi Arabia) won the award in the Processing and Conversion category for “a holistic system to convert non-plastic parts to plastic parts to improve cost position for customers.”

Taghleef Industries (Dubai) won the award in the Plastics and Environment category for its BOPLA sustainable packaging film, made of fully biodegradable polylactic acid (PLA) resin.

Naser S. Alghamdi and Krishna Prasad Rajan, both from Yanbu Industrial College (Saudi Arabia), won the award in the Talents in Plastics category for their development of completely biodegradable biocomposite materials based on date-palm fiber.

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This year’s show will be held October 2-5, 2011 at the Troy-Marrriott and will feature sessions on Material Development, PP Compounds, Application Development, Surface Enhancements, TPO/TPE Innovations, and a new session on Polyolefin Foam & Processes.

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tion this summer, to produce “one-pack” polymer additive blends. Adeka predicts that the Mideast polymer additives market will grow 10% per year from an estimated $120 million.

Research centers and education initiatives feed innovation

The Gulf Petrochemicals & Chemicals Association, which hosted its annual Plastics Summit in April and distributed Plastics Innovation Awards recognizing excellence in plastics conversion (see sidebar), says that a culture of innovation is critical for the region’s growth. Key players in the region are doing their part to foster innovation by building research facilities and encouraging plastics education. Borouge’s Innovation Centre in Abu Dhabi, due to be completed by the end of 2011, will work with the European innovation centers of Borealis as well as with local and international educational institutions such as the Petroleum Institute of Abu Dhabi to further develop the competence of polymer science in the United Arab Emirates, says the company. SABIC is building the Sabic Plastics Application Development Center at the Riyadh Techno Valley research complex inside the King Saud University campus, and expects to be operational in 2012. Recently the company announced an agreement to build a Research and Innovation Center at the King Abdullah University of Science and Technology. Saudi Arabian producers Tasnee and Saudi International Petrochemical Company (SIPCHEM) have also established innovation centers. In addition, non-profit educational initiatives include the Higher Institute for Plastics Fabrication (www.hipf.edu.sa), in Riyadh, Saudi Arabia, and the Gulf Plastics Pipe Academy, which has a branch in the HIPF facility and also in Borouge’s new innovation center.

The Middle East is poised for growth not only in petrochemical production, but also in research, development, and plastics innovation.