Polyethylene
Global Overview

Esteban Sagel, Director Polypropylene
Foro Pemex
Junio 2012
Ciudad de Mexico
Today’s Presentation

• Global Overview
• Mexico In The Global Context
• Short Term Forecast & Dynamics
Today’s Presentation

- Global Overview
- Mexico In The Global Context
- Short Term Forecast & Dynamics
Polyethylene: Still The Largest Polymer

2012 World Polymer Demand = 211 Million Metric Tons

- HDPE: 17%
- LLDPE: 11%
- LDPE: 9%
- PP: 25%
- PVC: 18%
- PET: 9%
- PC: 2%
- ABS: 4%
- PS: 5%
Cost Position Beneficial for PE Growth

Delivered Discounted Basis

U.S. Price, Cents Per Cubic Inch

- LLDPE
- PVC
- HDPE
- LDPE
- PP
- PS
- PET
- ABS

2007
2012
Growth Generalized, but Uneven

GDP Growth, %

Demand, Million Metric Tons

<table>
<thead>
<tr>
<th>Year</th>
<th>World GDP Growth</th>
<th>Demand TotPE</th>
<th>Demand LDPE</th>
<th>Demand LLDPE</th>
<th>Demand HDPE</th>
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</table>

AAGR 06-11: 2.1%  AAGR 11-16: 5.7%

LDPE 0.6% 3.5%
HDPE 3.1% 5.3%
LLDPE 4.5% 5.8%
Tot PE 2.9% 5.0%
GDP 2.1% 5.7%

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Developing World Driving Growth

Northeast Asia 31%
West Europe 15%
South America 6%
North America 20%
Other 28%

2006-2011 AAGR
- West Europe = -2.1%
- North America = -1.3%
- South America = 4.4%
- Northeast Asia = 6.4%
- Global = 2.9%

2011 Total Global Demand = 76 Million Metric Tons
Developing World Driving Growth

- Northeast Asia: 33%
- West Europe: 13%
- South America: 7%
- North America: 18%
- Other: 29%

2011-2016 AAGR
- West Europe = 1.7%
- North America = 2.8%
- South America = 5.8%
- Northeast Asia = 6.5%
- Global = 5.0%

2016 Total Global Demand = 97 Million Metric Tons
Capacity Continues To Grow

Global Capacity AAGR 11-16: 4.0%
Global Demand AAGR 11-16: 5.0%
In Spite of Growth, Global Market Oversupplied

Excess Capacity, Million Metric Tons

Excess Capacity as a % of Global Demand

- Excess Capacity, Million Metric Tons
- Excess Capacity as a % of Global Demand
- Global Excess Capacity
- Cumulative Global Excess Capacity
- Excess Capacity as a % of Global Demand

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In Spite of Growth, Global Market Oversupplied

![Graph showing global excess capacity and operating rate over years](image-url)

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Margins To Recover; Gas Based Production Enjoys Higher Margins

(Discharged Price, Integrated Producer)

Dollars Per Metric Ton

North America
West Europe
Asia


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North America: Advantaged Production

PE Cash Cost, Cents Per Pound

(Integrated Producers)

North America
West Europe
Southeast Asia

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Driver of Advantage: Shale Gas

Dollars Per MMBtu

Gas-to-Crude Ratio

Crude (WTI)  Natural Gas  Gas-to-Crude Ratio

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China Will Become Increasingly Self Sufficient

Domestic Demand, Million Metric Tons

Imports as a % of Domestic Demand

- China Domestic Demand
- Imports as a % of Domestic Demand
Trade Flows to Change

2011 Net Trade
-2789
-1444

2016 Net Trade
-2691
-1906

(Thousand Metric Tons)
Global Prices to Tighten Up

Cents Per Pound

Dollars Per Metric Ton


NAM LLDPE
CHINA LLDPE (Spot)
Mexico LLDPE
WEP LLDPE

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Today’s Presentation

• Global Overview
• Mexico In The Global Context
• Short Term Forecast & Dynamics
Mexican Petrochemical Demand and Production

Million Metric Tons

- Domestic Demand
- Production

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Polyethylene Demand in Mexico Growing

- Extrusion Coating
- Film & Sheet
- Pipe & Profile
- Blow Molding
- Wire & Cable
- Injection Molding
- Rotomolding

Mexico Growth Rate, Percent

-6 -4 -2 0 2 4 6 8

AAGR Domestic Demand 11-16 = 5.5 %

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Mexico: Net Polyethylene Importer

Net Trade, Million Metric Tons


South America USA Canada Mexico Americas

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Where is Material Going to Come From?

**2011**

- North America: 98.3%
- Middle East: 1.0%
- Other: 0.8%

**2011 Total Imports** 1.15 MMT

**2016**

- North America: 90.0%
- Middle East: 6.8%
- Other: 3.2%

**2016 Total Imports** 1.09 MMT
## Thousand Metric Tons

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<th>LDPE</th>
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* No firm announcements, CMAI speculation

** Sasol announced a new cracker in Lake Charles, LA (1.4 million tons per year). The startup year was not released.
Mexico Prices To Be Competitive

Cents Per Pound

NAM LLDPE
CHINA LLDPE (Spot)
Mexico LLDPE
WEP LLDPE

Dollars Per Metric Ton

Jan-08  Oct-08  Jul-09  Apr-10  Jan-11  Oct-11  Jul-12  Apr-13

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Today’s Presentation

- Global Overview
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Polyethylene Current Situation: US

- Domestic Demand: -0.05% through April
- Export demand – 12.5% through April
- April weakest demand month of the year
- Prices poised to decline
- Buyers purchasing on as needed basis only
- ExxonMobil has announced a 4 cent drop for May
- Further drops anticipated
Domestic sales down 2 percent in the first quarter of this year compared to 2011.

Most contract prices for commodity grades ended April up by approximately the increase of the ethylene contract price of €30 to €40 per metric ton = best margins of 2012.

An initial settlement was agreed upon for the May ethylene contract price at €1,325 per metric ton, a decrease of €20 per metric ton compared to April.

Polyethylene prices are decreasing well beyond the ethylene decrease of €20 per metric ton.

June prices are forecast to go down strongly.

Middle Eastern producers are likely to increase supplies to Europe as a reaction to the continuing weak demand for imports from China.

<table>
<thead>
<tr>
<th></th>
<th>2011 (Q1)</th>
<th>2012 (Q1)</th>
<th>AAGR 11-12</th>
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<tbody>
<tr>
<td>Thousand Metric Tons</td>
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<tr>
<td>Production</td>
<td>2,937</td>
<td>2,841</td>
<td>0.2%</td>
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<tr>
<td>Blow Molding</td>
<td>376</td>
<td>341</td>
<td>-2.7%</td>
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<tr>
<td>Inj. Molding</td>
<td>424</td>
<td>384</td>
<td>-3.5%</td>
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<tr>
<td>Wire &amp; Cable</td>
<td>88</td>
<td>81</td>
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<td>Mono/Split</td>
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<td>36</td>
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<td>1,565</td>
<td>1,478</td>
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<td>Dom. Demand</td>
<td>3,053</td>
<td>2,833</td>
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<td>Imports</td>
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<tr>
<td>Exports</td>
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<td>614</td>
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</table>
In 2012, the trade balance of HDPE is likely to shift with the start-up of Saudi Polymers’ HDPE plants in Al-Jubail, Saudi Arabia with a combined annual capacity of 1.1 million metric tons.

The output of these new plants is expected to impact Europe as shareholder Chevron Phillips does not own polyethylene assets in Europe.

The first quarter price increases in Europe, combined with continued weakness in the Asian markets, provide incentive for more imports into Europe from the Middle East.
Demand weakened in April and into May
Market sentiment remains bearish and trading activities are thin
Sinopec and PetroChina continue running at reduced rates due to weak demand and negative margins
PE inventories are very high at both producer and converter: Inventory at the ports is at 95% of capacity
The agricultural peak season ended in a disappointing fashion in mid April
Supplies from the Middle East are ample
Further price reductions appear likely
Some converters are mixing in recycle PE in order to lower production costs
China’s Q1 PE imports reached 2.1 million metric tons, 6.5 percent higher than Q1 2011, but about 8.7 percent lower than Q1 2010.
Conclusions

- Polyethylene demand growing on global basis
- Low relative cost helping
- Industry globally oversupplied; demand growth and restrain in investments will help improve supply and demand balance
- Light feedstock advantage will help Mexico and North America
- Trade to become challenging, as China increases self sufficiency
- Mexico net importer of PE; situation to remain the same even after Braskem Idesa starts up
- Mexican prices to remain competitive
- Global markets situation challenging in first half of 2012; depressed market sentiment to prevail in future months