

# Polycarbonate Market Overview

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# IHS Markit addresses strategic challenges with interconnected capabilities

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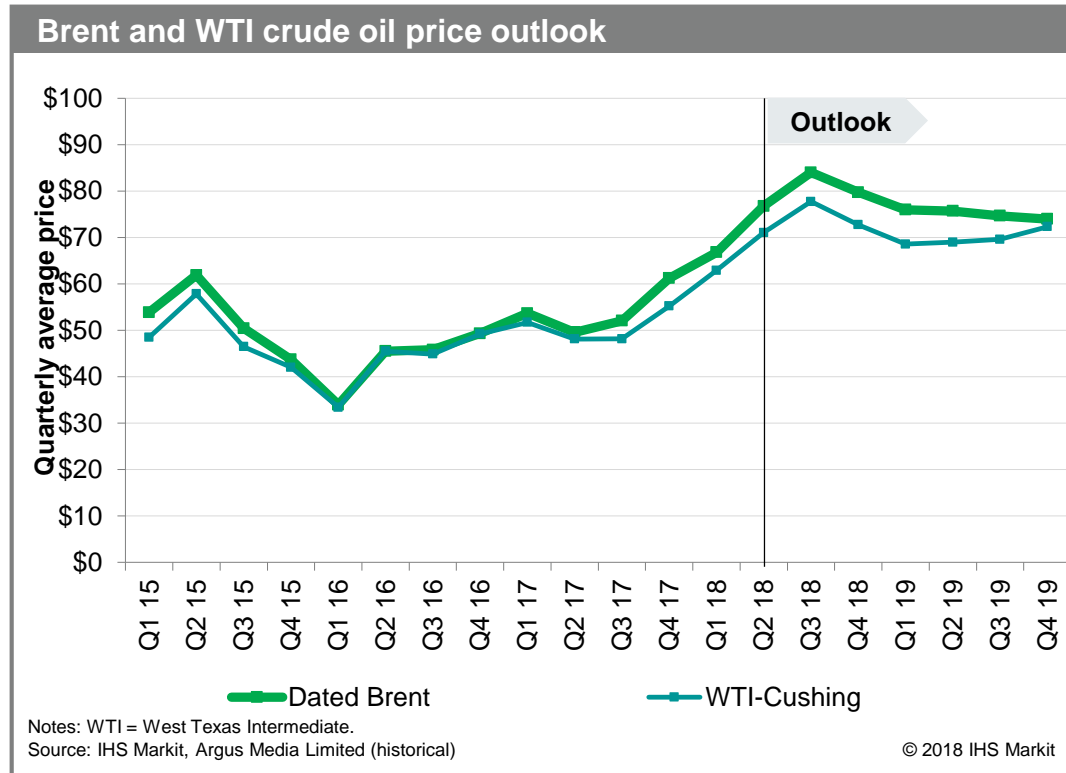


# Agenda

- Energy – cost drivers
- Supply Overview
- Pricing

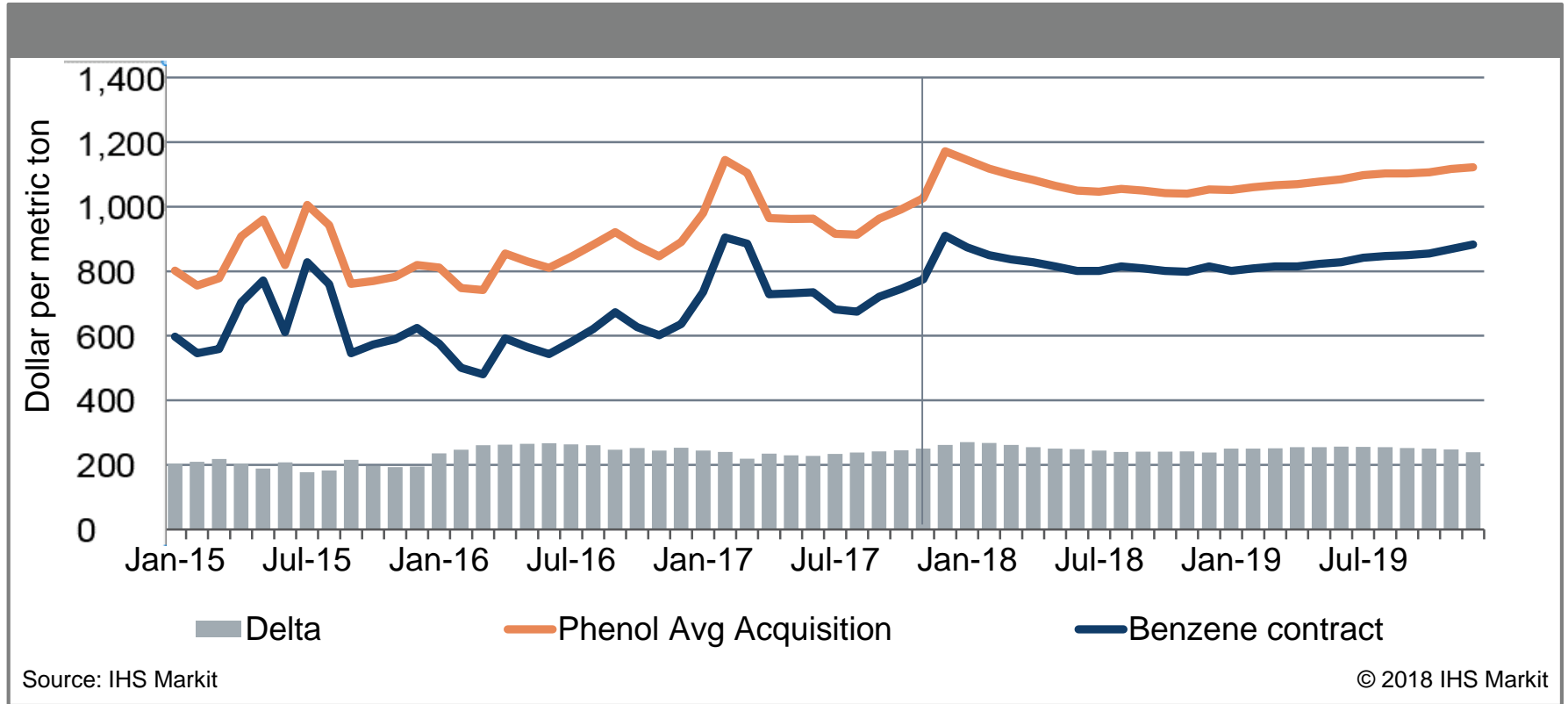


## Oil prices to stay loftier for longer, sustained by supply outages and risks



- **World demand.** World liquids demand growth stays robust this year, at 1.8 MMb/d, Growth eases to 1.5 MMb/d in 2019.
- **OPEC production.** The Gulf-3, led by Saudi Arabia, maintain output restraint through most of 2018, while output from the rest of the group falls in part because of involuntary losses, especially from Venezuela. Russia and KSA announced recently a lift in output.
- **US production.** With the annual WTI price averaging roughly \$70/bbl this year and next, US crude output rises at a blistering annual pace of 1.3 MMb/d in 2018 and 1.1 MMb/d in 2019.
- **Global liquids balance.** Lower OPEC output and strong world demand growth help tighten the liquids balance in 2018, even as US supply rises rapidly.

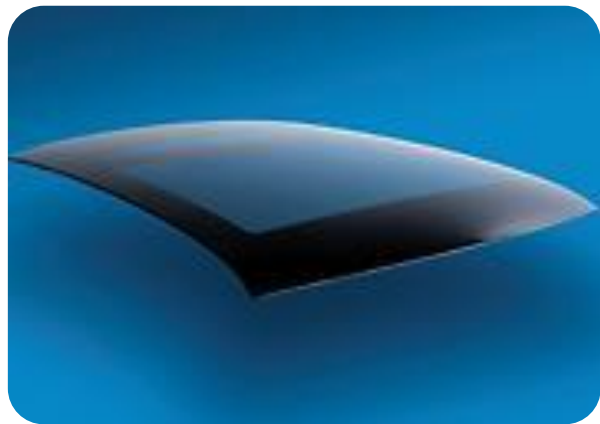
# Phenol Follows Benzene's Lead



Source: IHS Markit

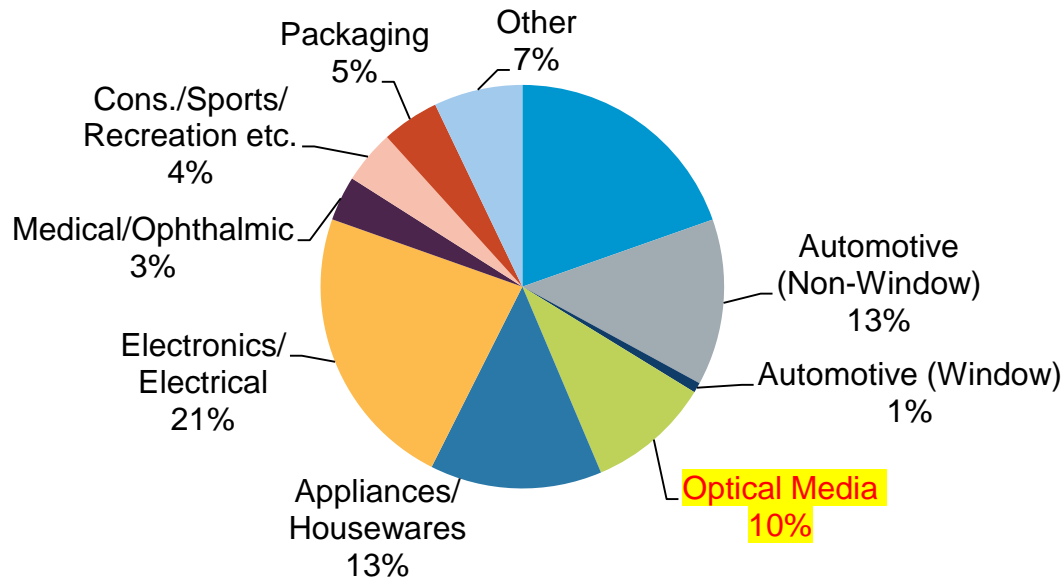
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## Polycarbonate Highlights



- ❑ Rationalization of plants in the US, Singapore, Japan and Brazil have removed excess capacity raising operating rates
- ❑ Increased vulnerability to interruption
- ❑ Prices continue to move up
- ❑ New plants announced in China add significant capacity in 2019 and beyond

# Global Polycarbonate Demand by End Use



Source: IHS Markit

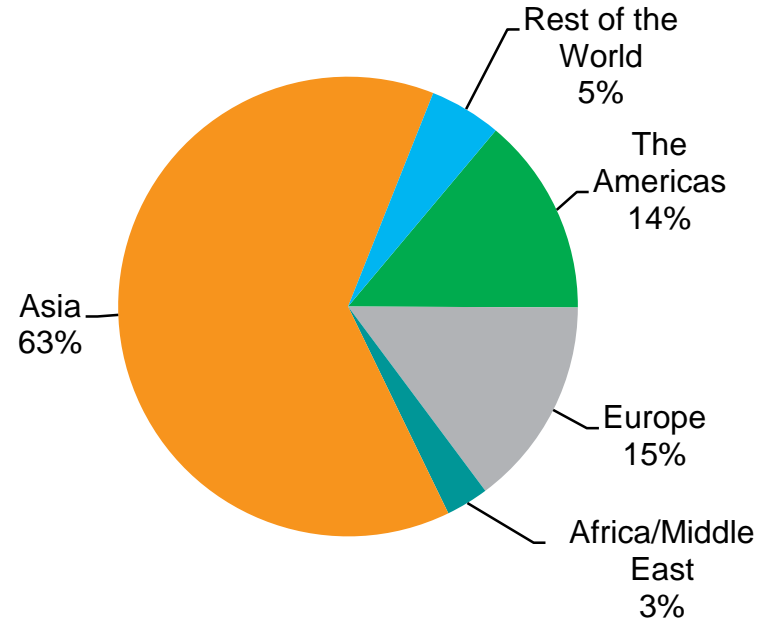
**Demand = 4.1 Million Metric Tons**

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# Polycarbonate Demand Growth

- Forecasted average annual growth rate to improve to 3.3% for 2017 – 2022 from 2.2% in the prior five years.
- Shrinking optical media demand is a large headwind to polycarbonate growth but more than offset by strong increases in other applications
- Asia consumes 63% of global supply.

World: 2017 Polycarbonate Demand by Region



**2017 Global Demand = 4.1 Million Metric Tons**

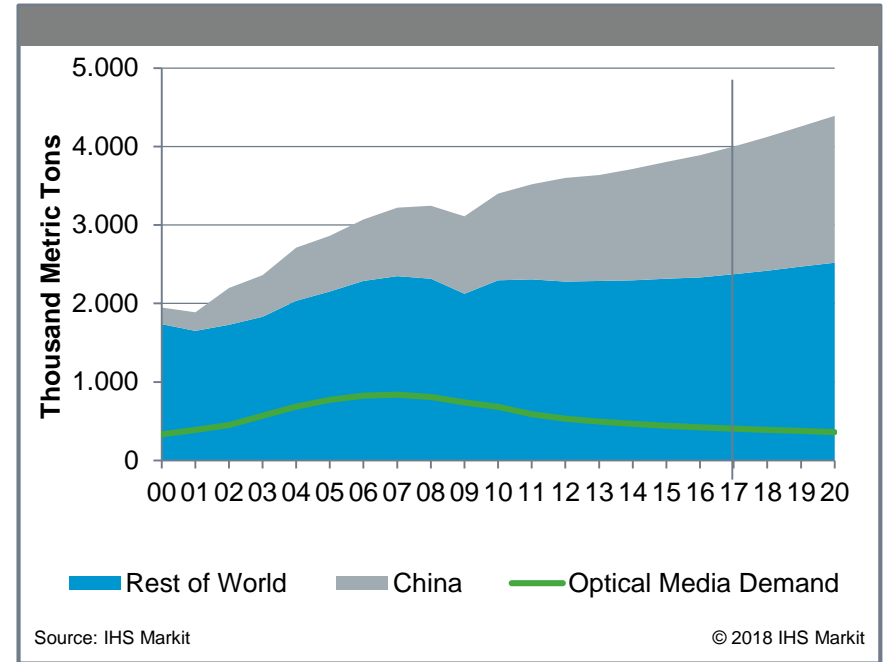
Source: IHS  
Markit

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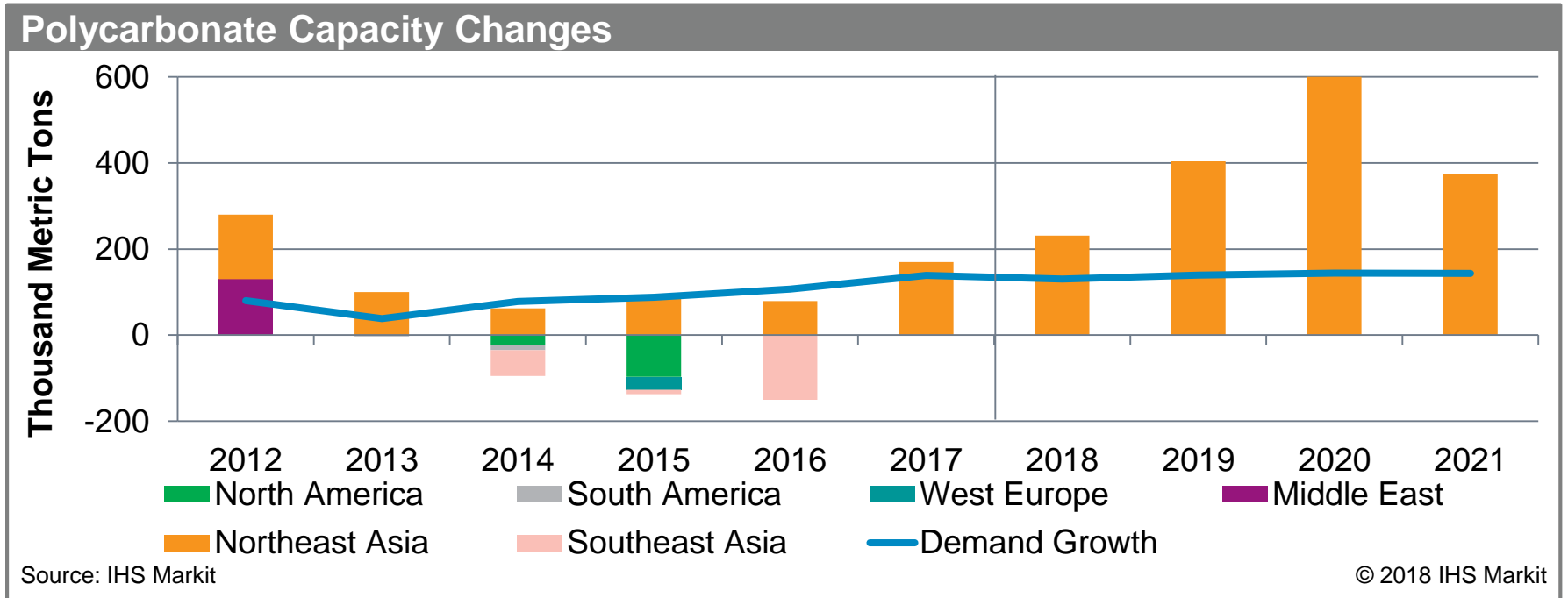


# China Demand is driving the change

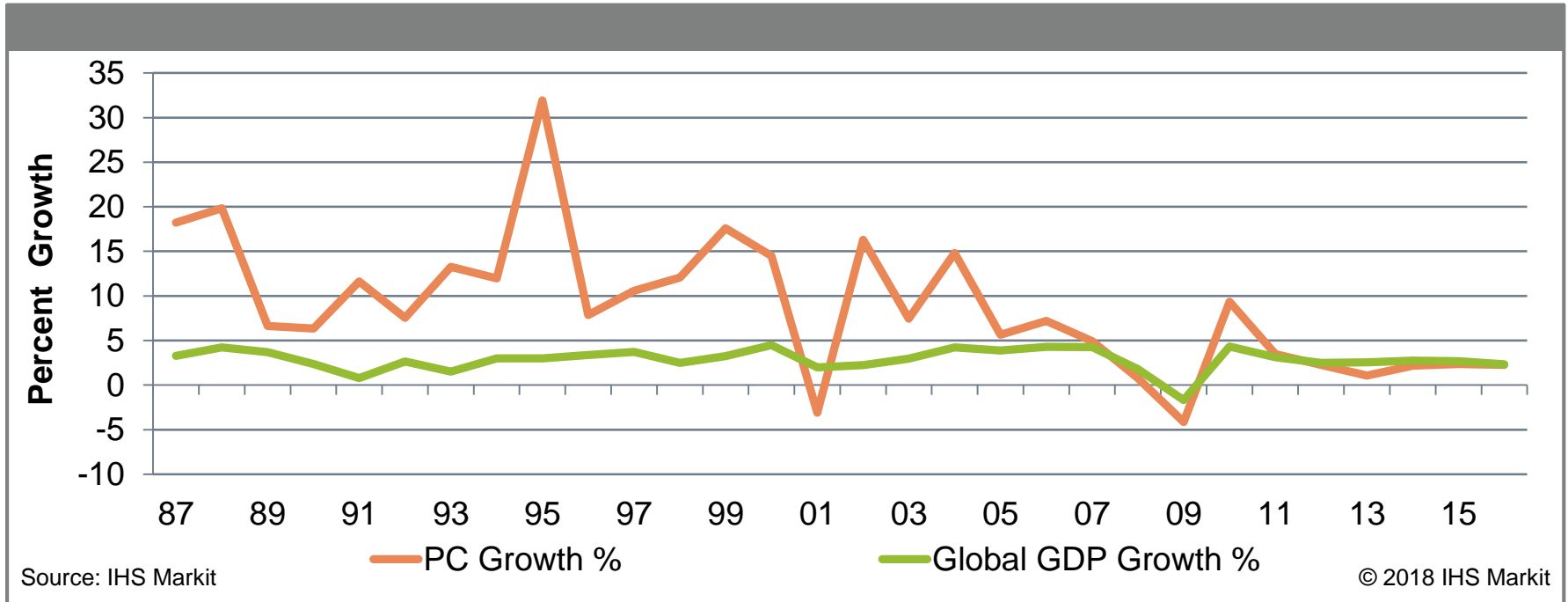
- China grew to 40% of global PC demand while becoming the 'workshop of the world'
- China is  $\frac{2}{3}$  of Asia demand, growing 5% annually
- China has only 14% of capacity
- New plants announced in China add significant capacity in 2019 and beyond



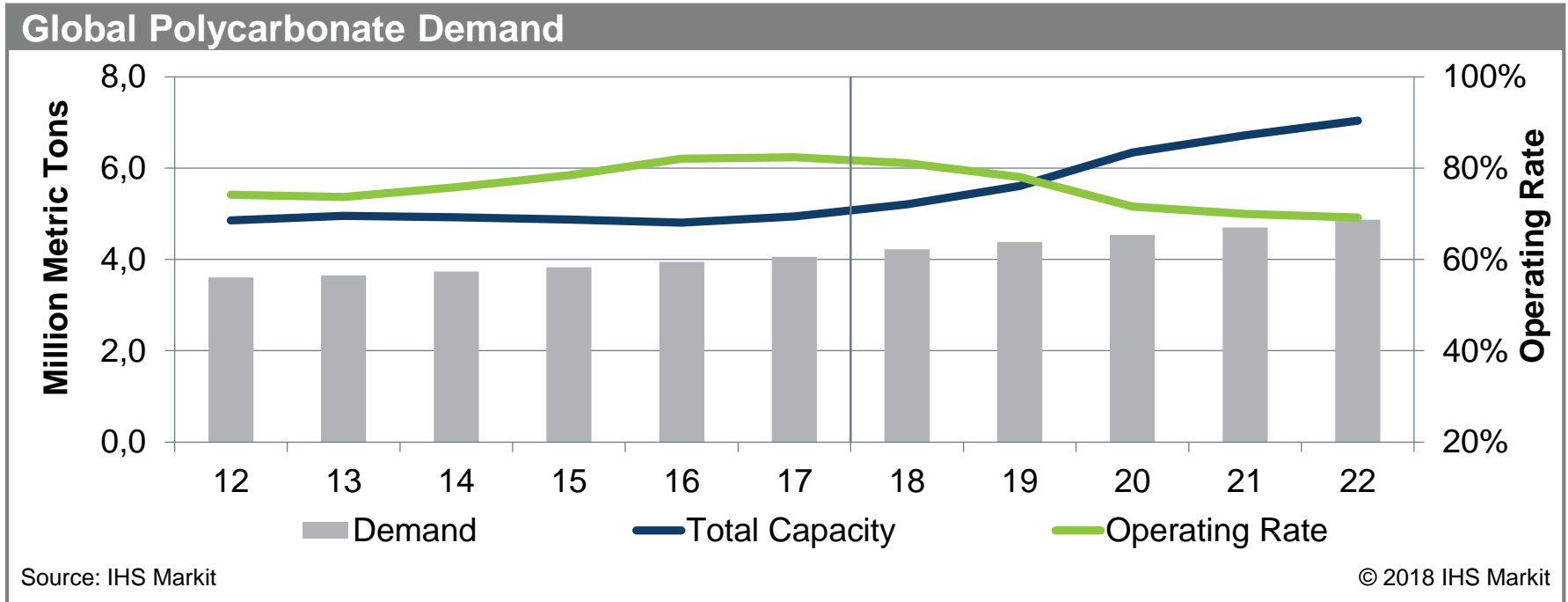
# Plant Closures Restore Market Balance for Now



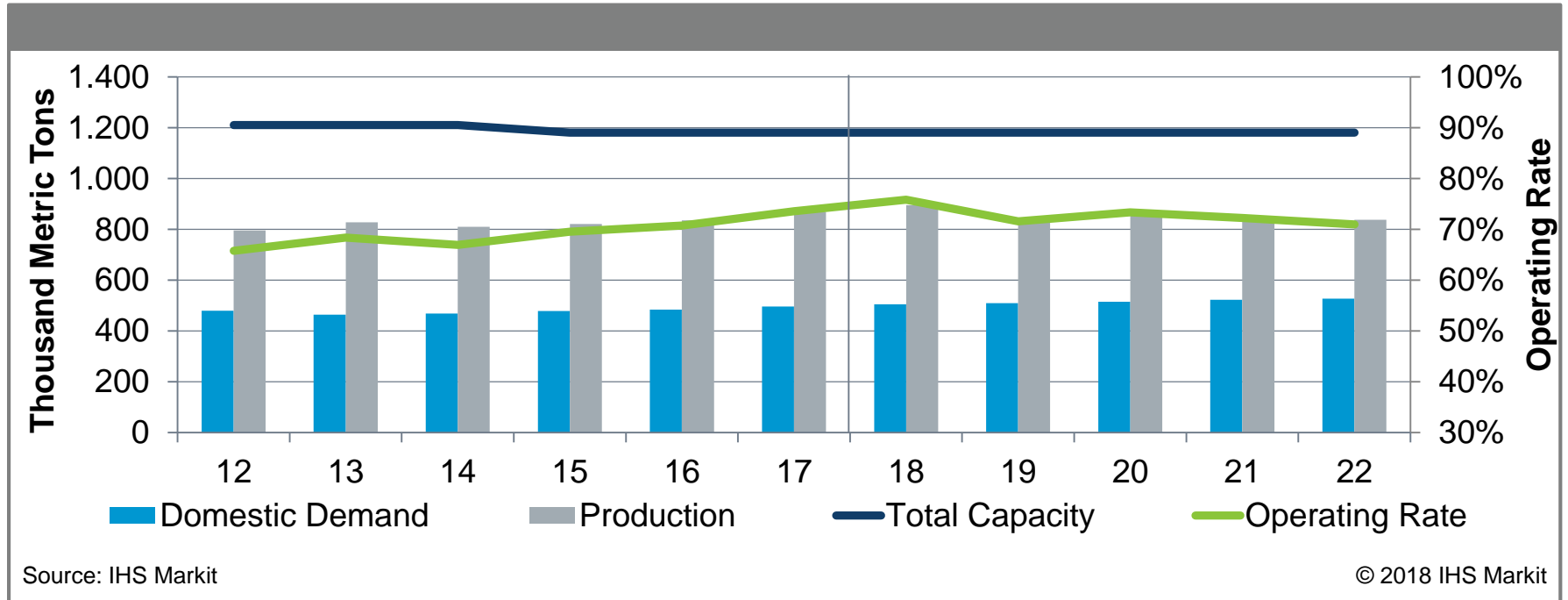
# Growth slowed – PC became commodity



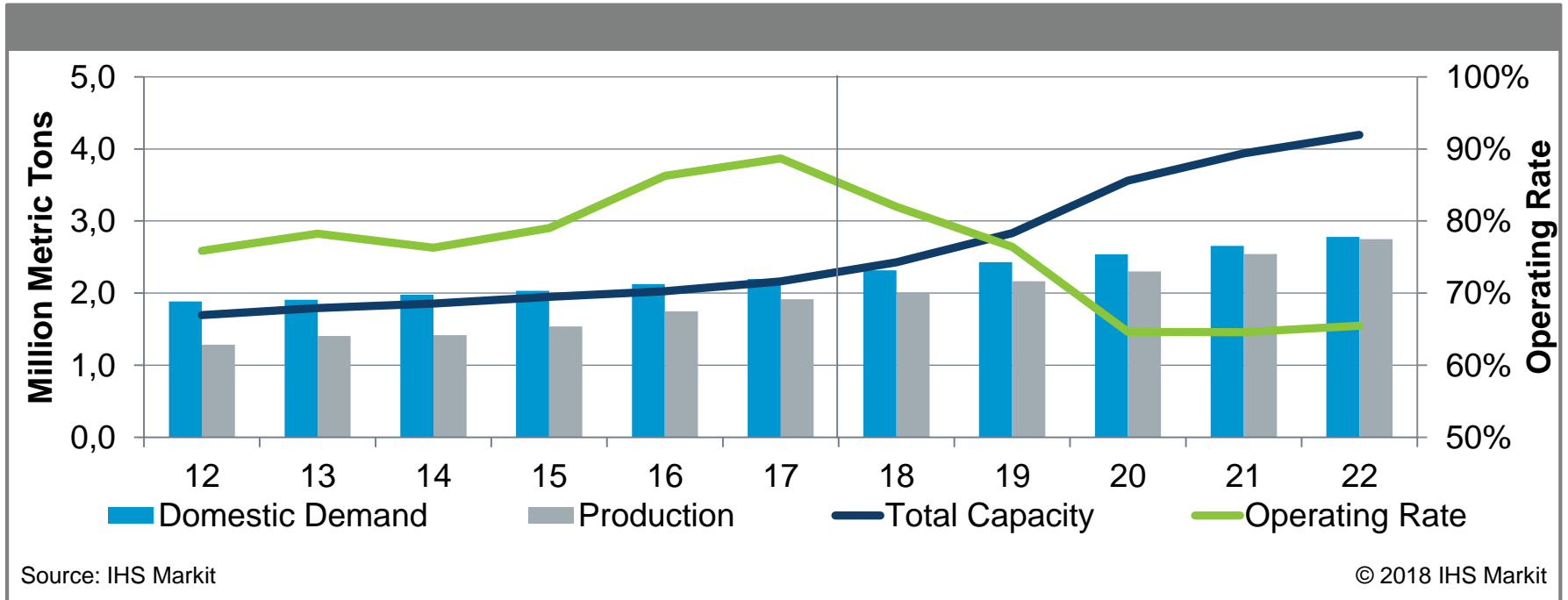
# Prospects for Moderate Growth



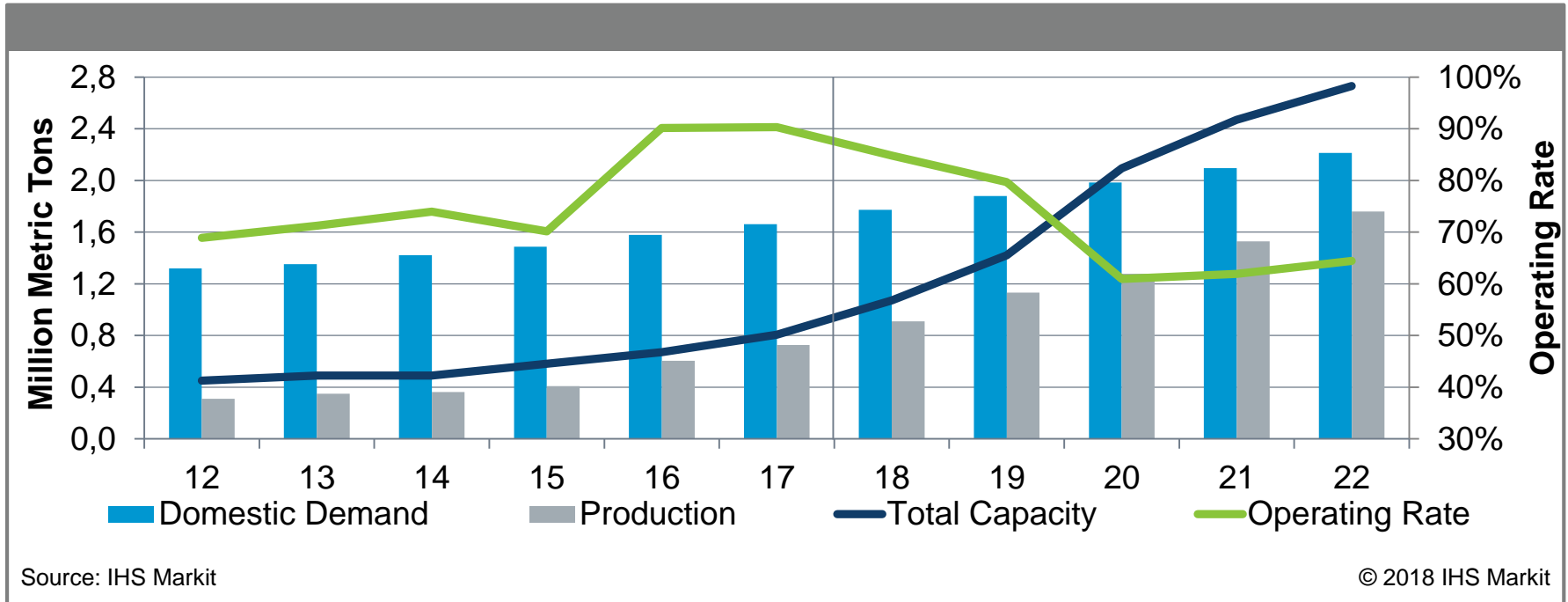
# W. Europe Polycarbonate Supply & Demand



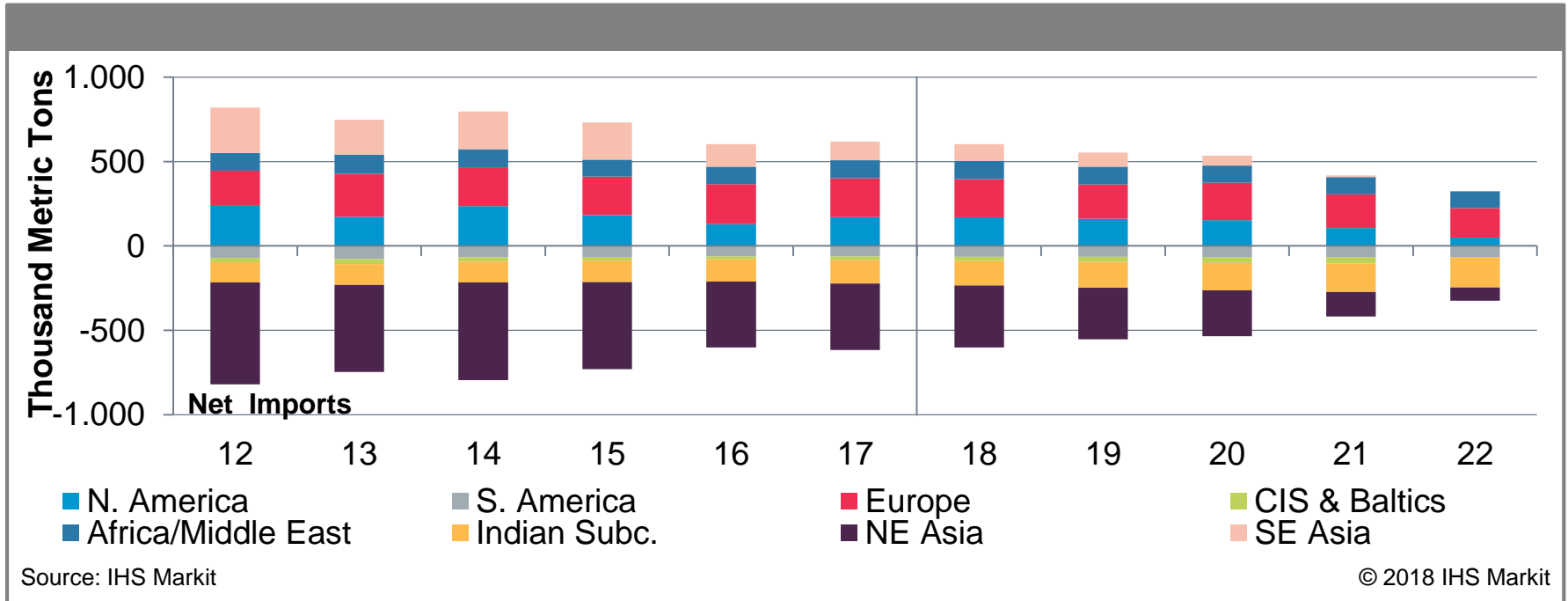
# N.E. Asia Polycarbonate Supply & Demand



# China Polycarbonate Supply & Demand

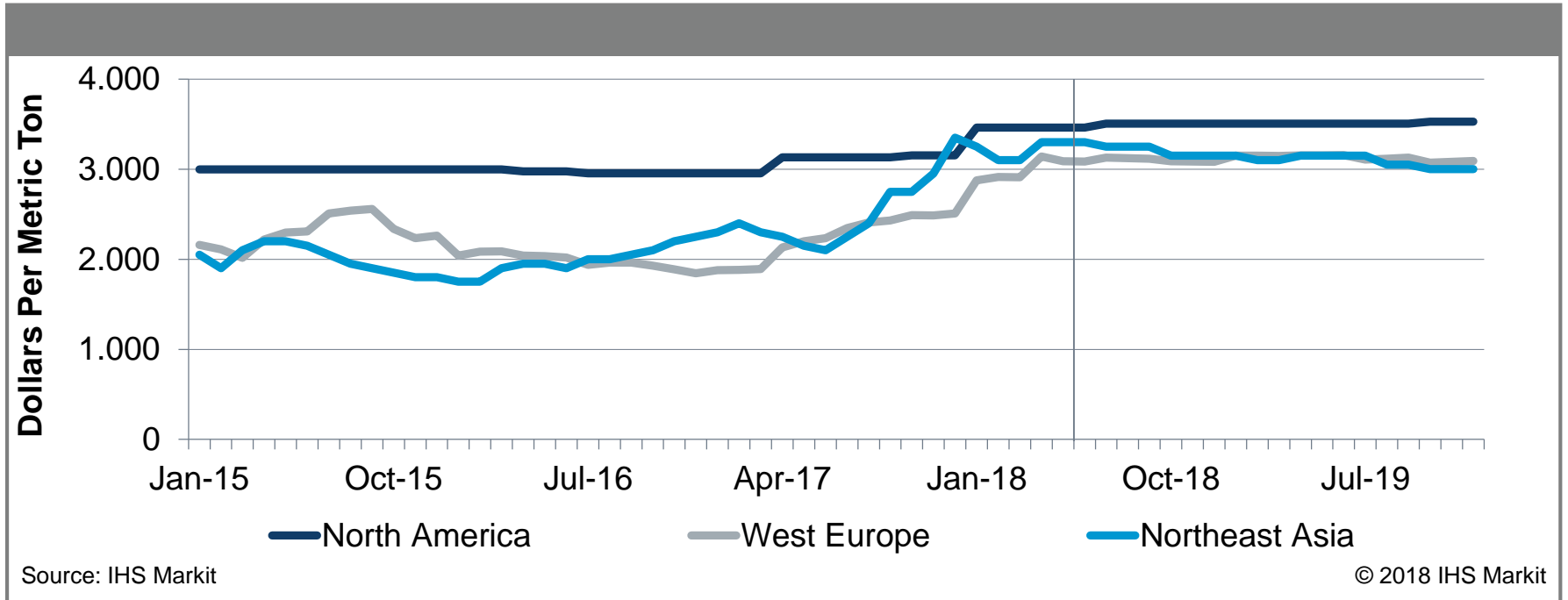


# Polycarbonate Regional Net Trade

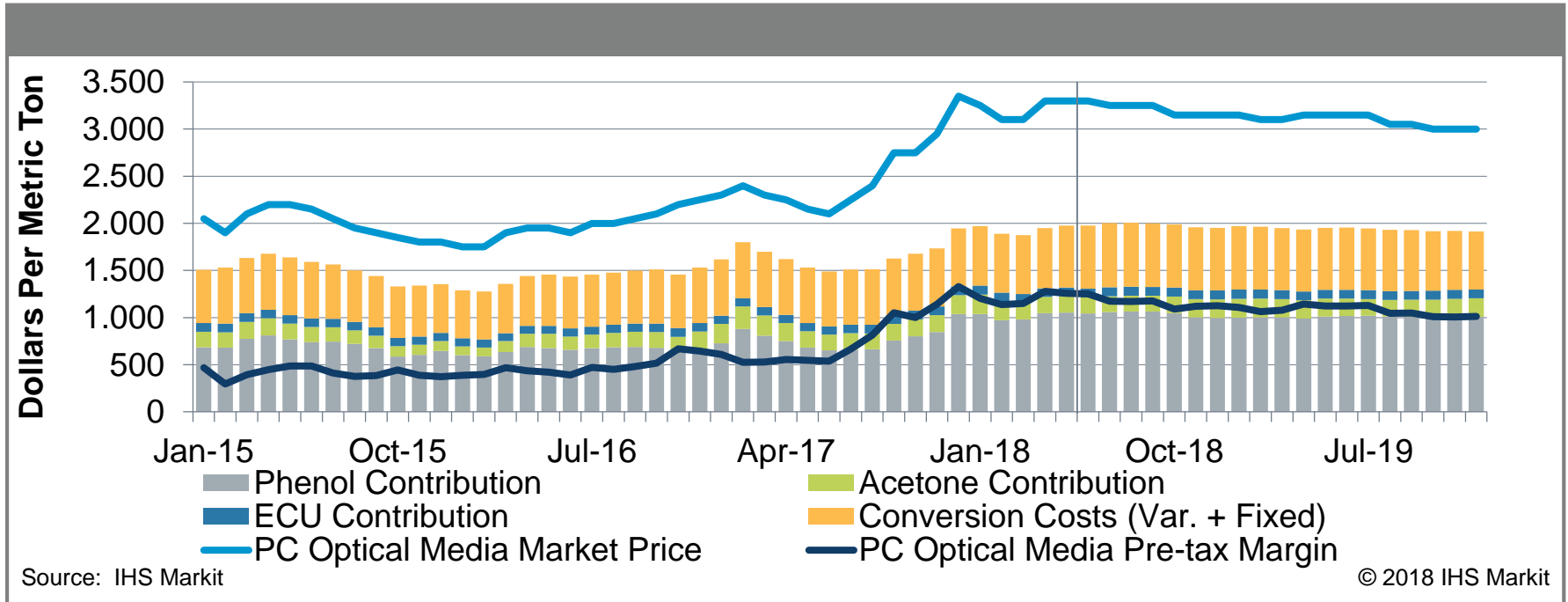




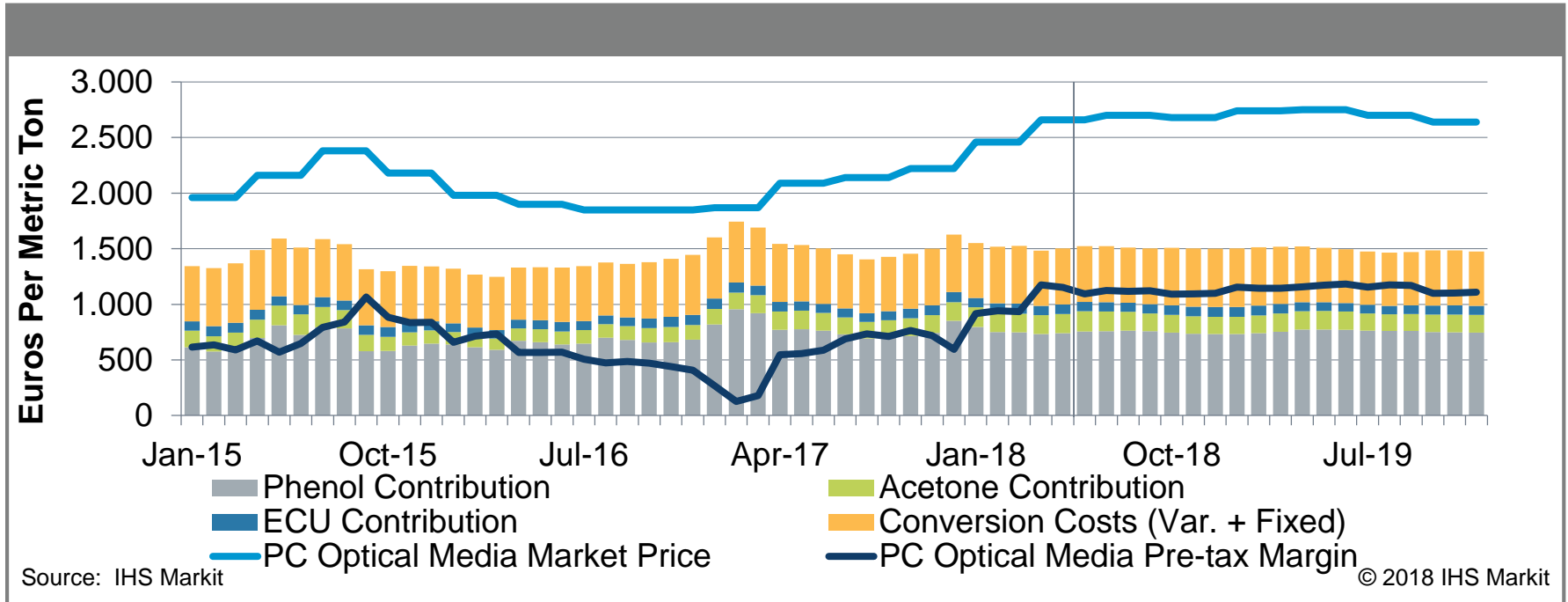
# Optical Media Grade – Lower spread between the regions



# Polycarbonate Margins NE Asia (Optical Media Grade)



# Polycarbonate Margins W. Europe (Optical Media Grade)



## Strategic Implications Polycarbonate

High operating rates through 2018 amplify interruption risk.

Prices and producer margins will be maintained

Entry of new Chinese companies is a game changing development

Growth in demand forecasted at just above GDP and not all the new capacity required...

Thank you