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## Flame Retardant markets to 2018

INDUSTRIAL MINERALS  
**in**EVENTS

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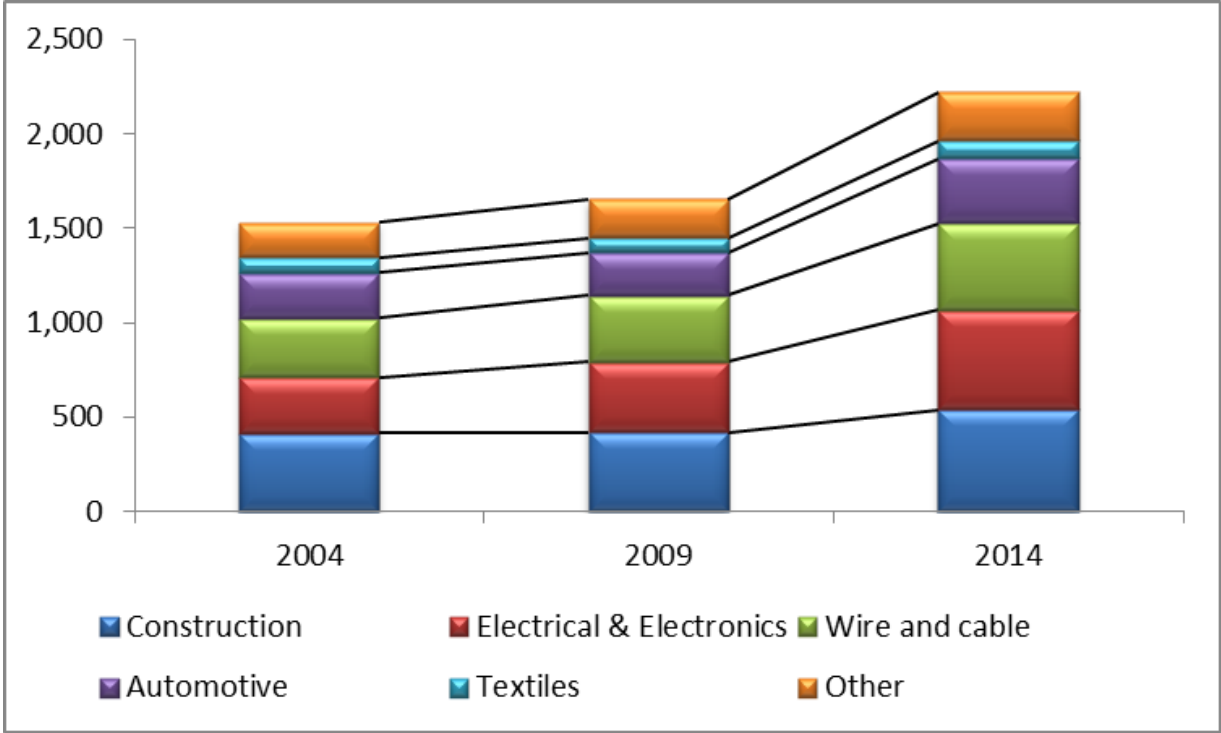
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- Flame retardant markets in 2014
  - MDH's niche
- Growth within this niche
  - Polymer markets to 2018 by region and by polymer
  - Growth drivers for MDH over the same period

# Flame retardant markets

# Demand for flame retardants grows faster than GDP growth

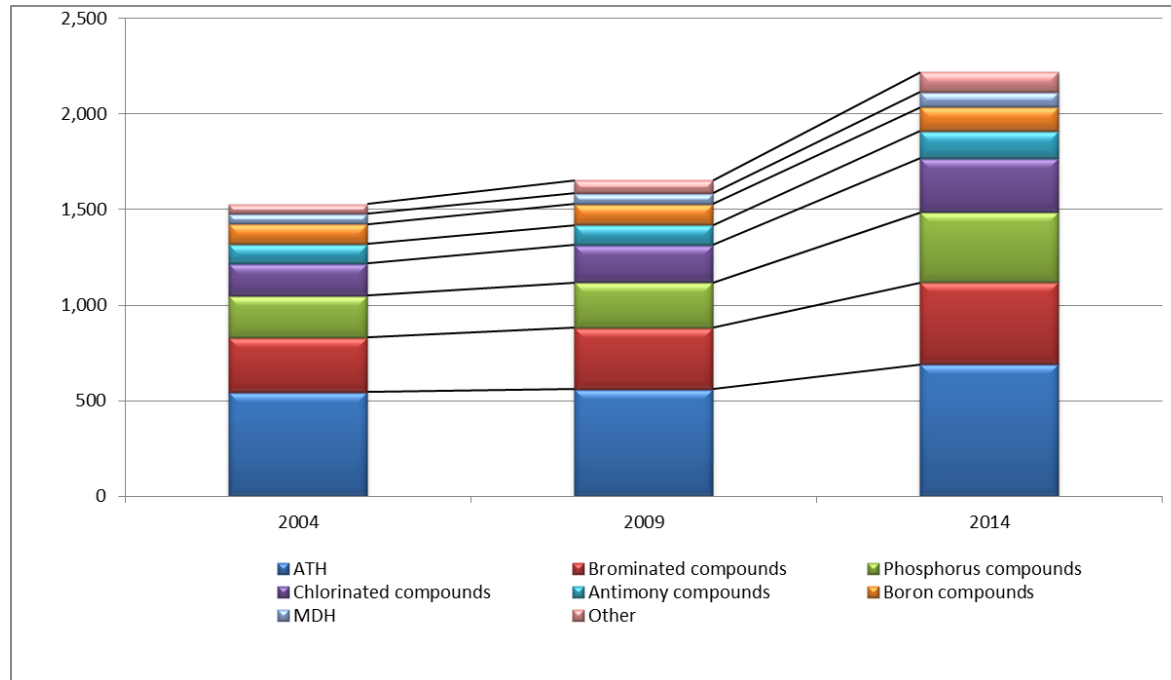
## World: Demand for flame retardants by end-use 2004 to 2014 (000t)



Source: Roskill

## MDH's niche only a fraction of the size of ATH market

### World: Demand for flame retardants by compound 2004 to 2014 (000t)



Source: Roskill

- Further penetration gains for FR polymers
  - Increasing affluence worldwide, but especially in Asia, driving demand for safer, flame retarded products
  - Prospect of more stringent fire safety standards and legislation in the BRICs
- Infrastructure spending to 2018

- MDH is more expensive than ATH, but is used as an alternative to ATH in polymers which have higher processing temperatures, because it is stable up to temperatures of  $>300$  C (versus ATH which decomposes around 200 C)
- Roskill analyses the markets for antimony, bromine, magnesium compounds, boron and alumina: Since 2005, some of these FR prices have quadrupled

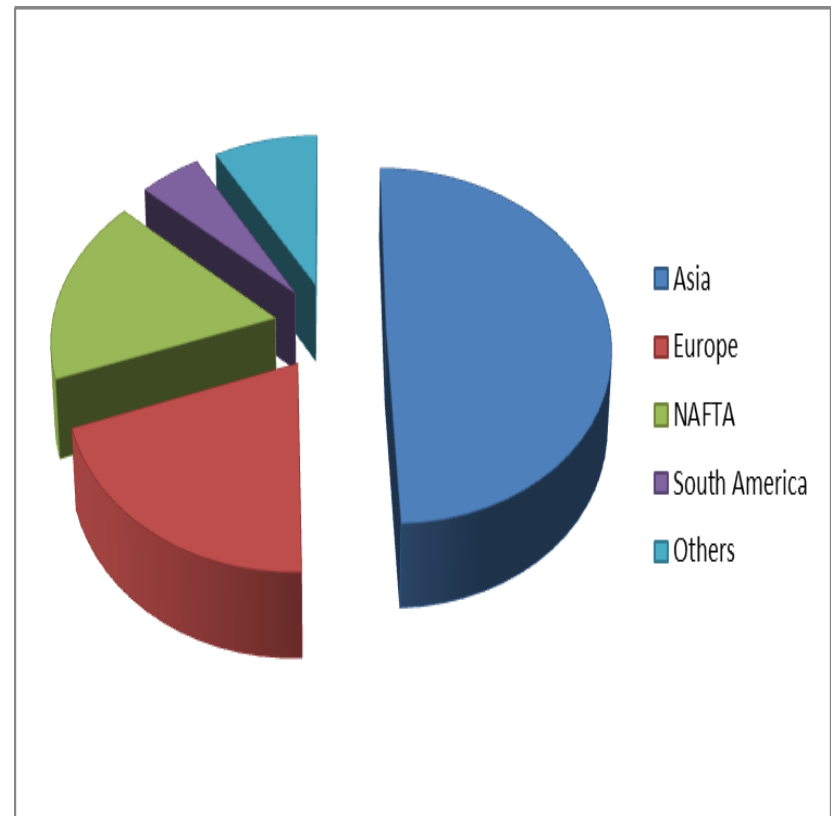


- Polymers are by far the largest market for metal hydroxide FR compounds
- MDH markets are a niche within a niche – metal hydroxide FR compounds are not the only FR option available to technical polymer compounders
- Polymer compounders, such as Inno-Comp here in Hungary, are the recipe mixing customers for MDH that exist between producers and processors

# Growth within the MDH niche

- World polymer demand increased by almost 6%py up to 2008 led by Europe, NAFTA and China
- Demand has recovered at <5.5%py since 2009 led by China (now the world's largest country market)
- World market for FR compounds driven by growth in automotive, electrical, appliances, cable

**World polymer demand by region, 2014 (Mt)**

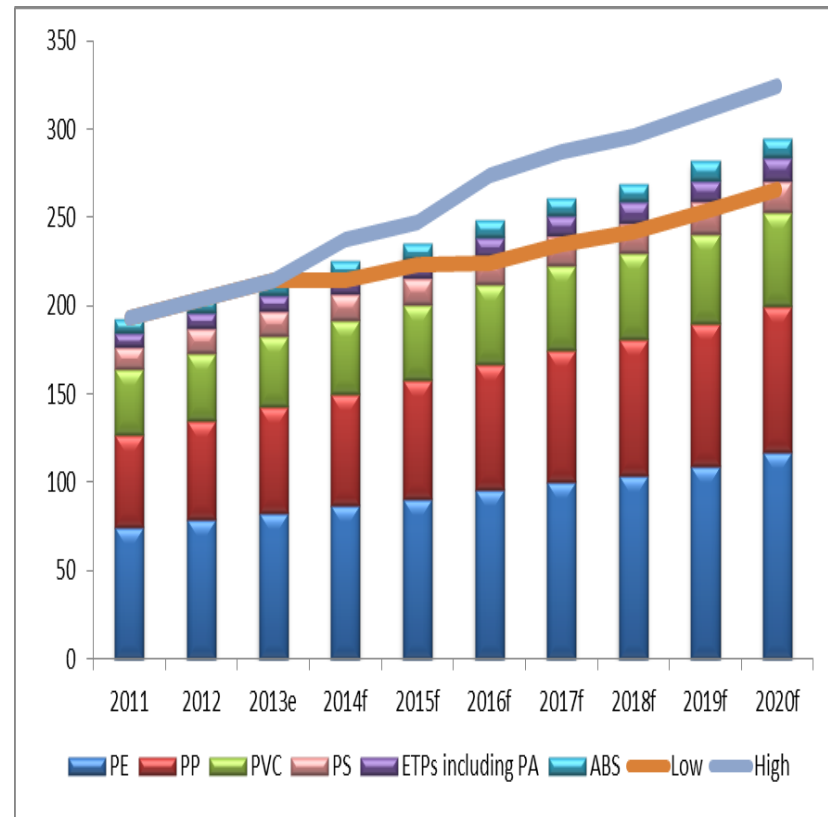


Source: Roskill

## ATH and MDH flame retardant compound demand

- Driven by legislation
- Most FR tests require loadings of 60 wt % ATH or MDH : 40 wt % polymer and other additives
- More stringent tests sometimes require >70 wt %
- FRs are expensive and these loadings can compromise other polymer properties

### World demand, selected polymers to 2018 (Mt)



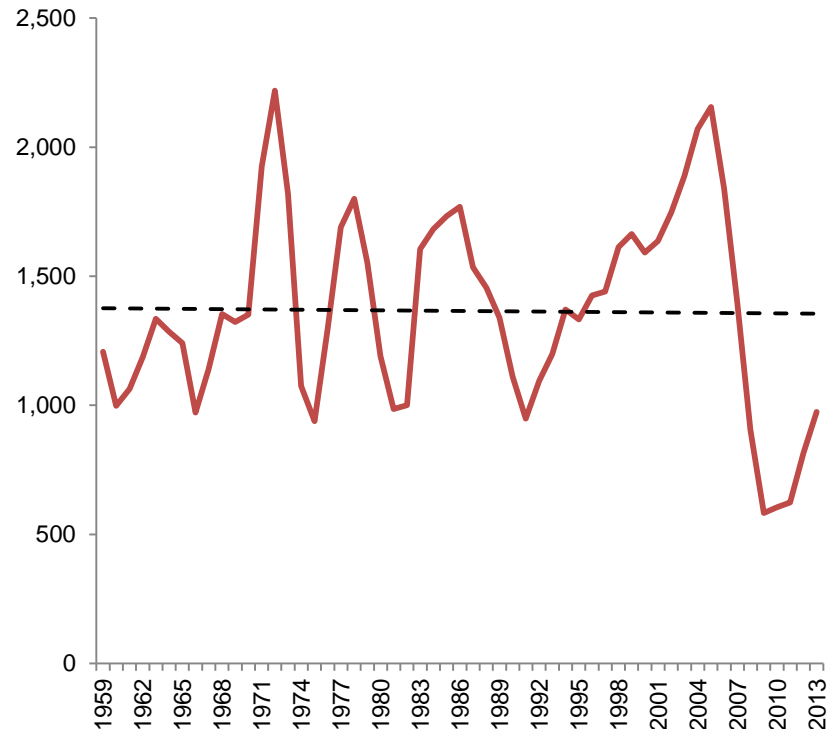
Source: Roskill

# Growth by region

## NAFTA is the largest regional market for MDH flame retardants

- NAFTA is a relatively large market for non-halogenated FRs – partly due to the voluntary phase-out of Deca
- Demand is finally recovering in North America, Japan and Europe
- 2014 will be the first year that GDP in these 3 mature economies grows simultaneously since 2010

### US housing permits, 1959 to 2013 (000)

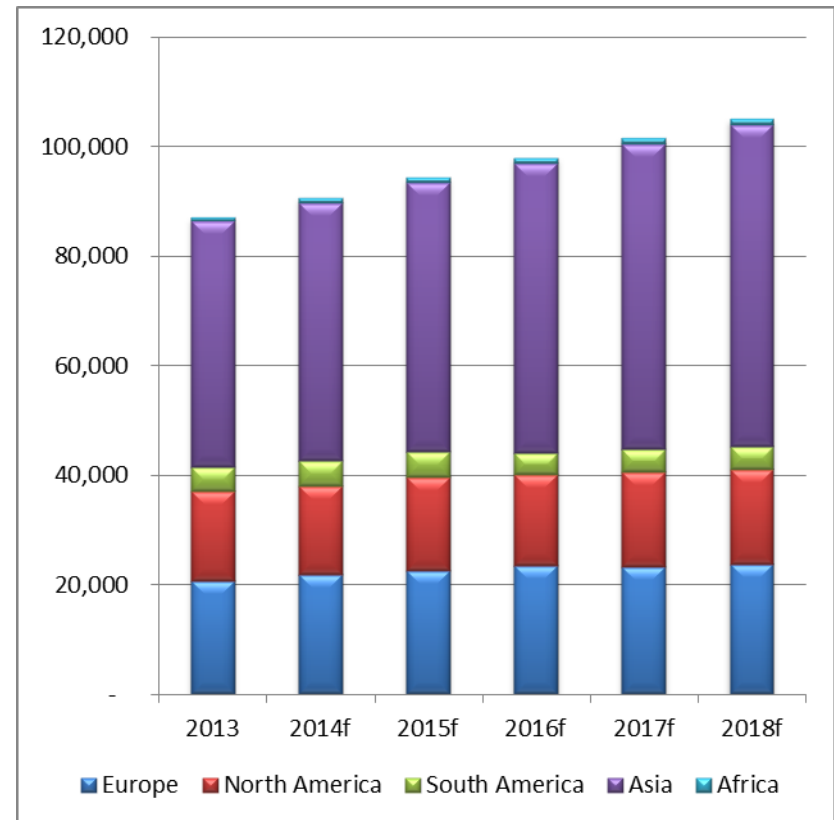


# Growth by sector

## Automotive - largest sector for the PP and PA compounds that use MDH

- For car producers, Asia (particularly China) represents the greatest opportunity for growth
- However, China believes that this position creates an opportunity to drive the standards and architecture of future automotive technology.
- A country's threshold of mobility lies near US\$10,000 GDP per capita (PPP) – this is where automobile ownership accelerates

**Vehicle production to 2018 (000 units)**





# Conclusions

- MDH markets, a niche within a niche, are concentrated within some notoriously cyclical industries, including:
  - construction, automotive and appliances
- The good news is that these industries are all on an upswing, recovering from the world economic recession
- Roskill expects world consumption of MDH in FR applications to average 4% py growth to 2018, reaching 108,000 tpy

# Roskill's report on Magnesium Compounds and Chemicals



**Thank you for your attention  
Any questions?**

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