Plasticizer Market Update

SPI Vinyl Products Division

22nd Annual Vinyl Compounding Conference

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BASF Corporation

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Agenda

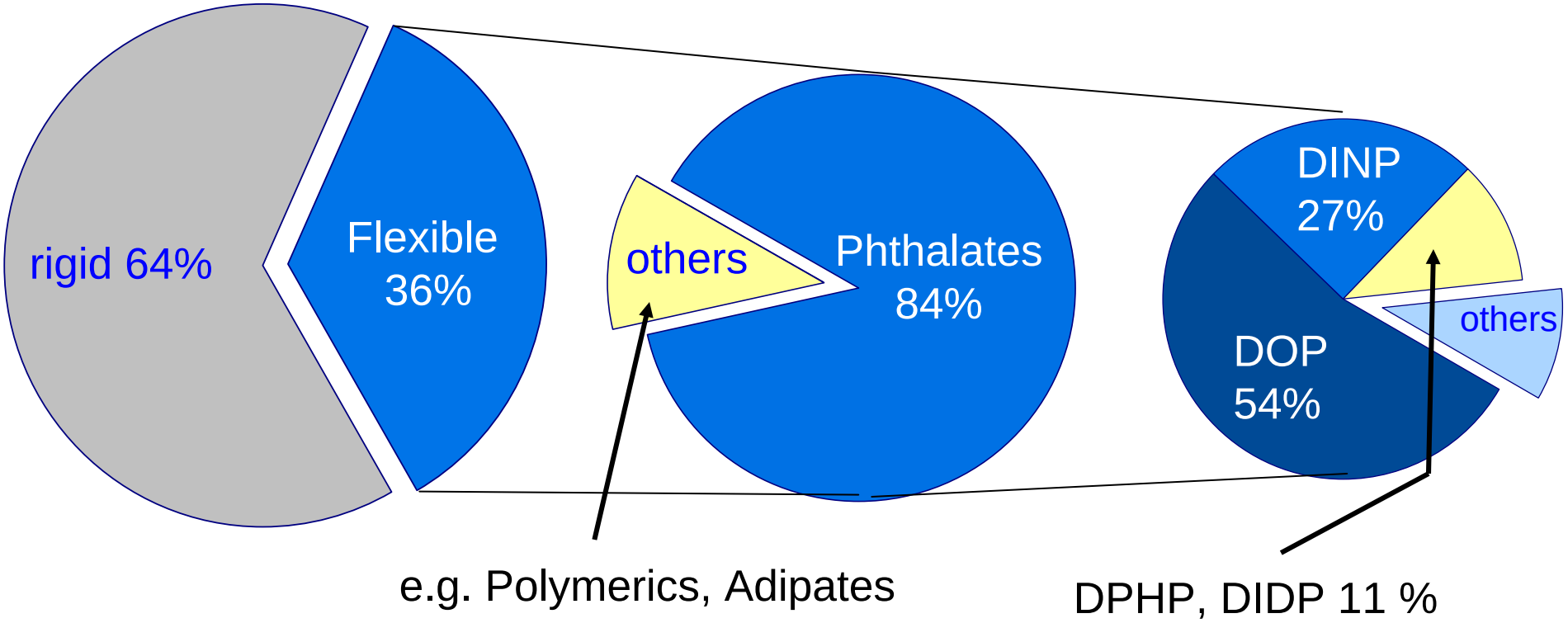
- **Global Plasticizer Market – Consumption, Capacities, Trends**
- **North American Plasticizer Overview**
- **Phthalate Esters Issues Update**

Global Plasticizer Market Structure 2010

34 Mio. t PVC

5.8 Mio. t Plasticizers

4.9 Mio. t Phthalates



Source: SRI, CMAI, BASF estimates

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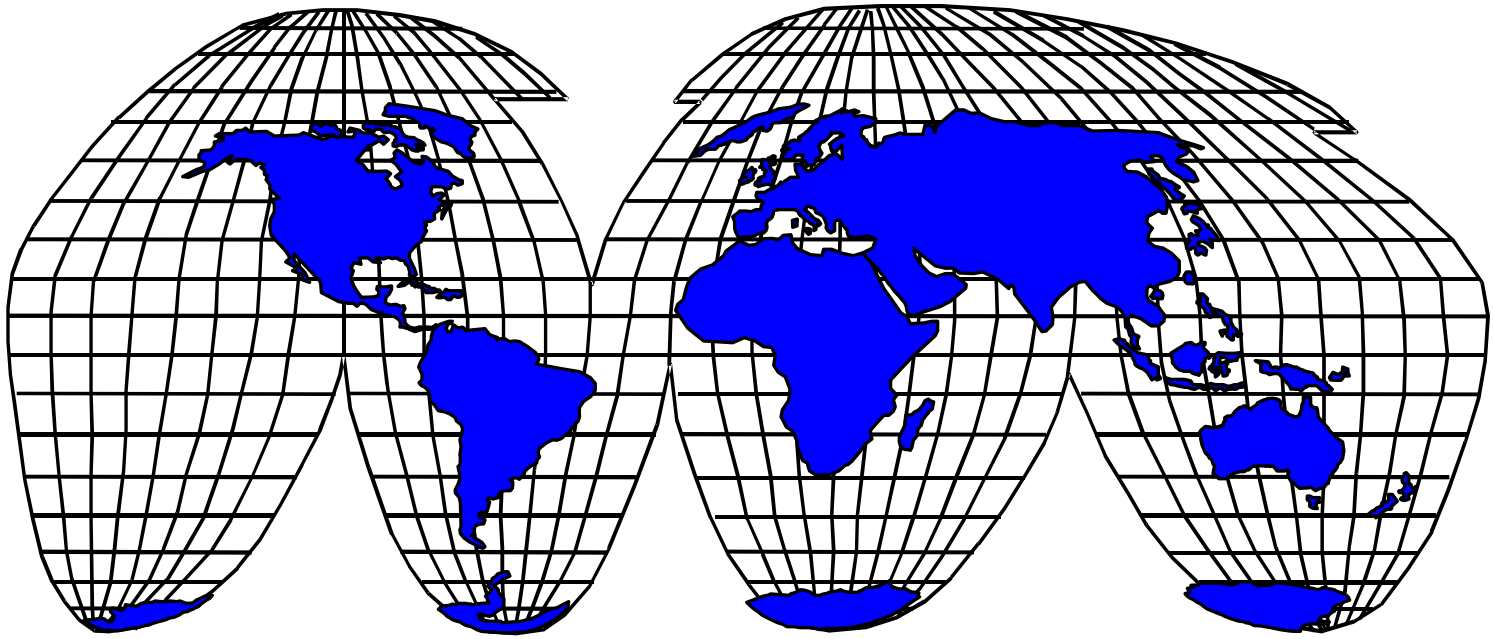
World Plasticizer Market

Estimated Consumption 2010



Region	*Americas*	*Europe, M.E., Africa*	*Asia*
Consumption	1.1 Mio. t	1.4 Mio. t	3.5 Mio. t
		Total ~ 6.0 Mio. t	

Source: SRI, CMAI, BASF estimates

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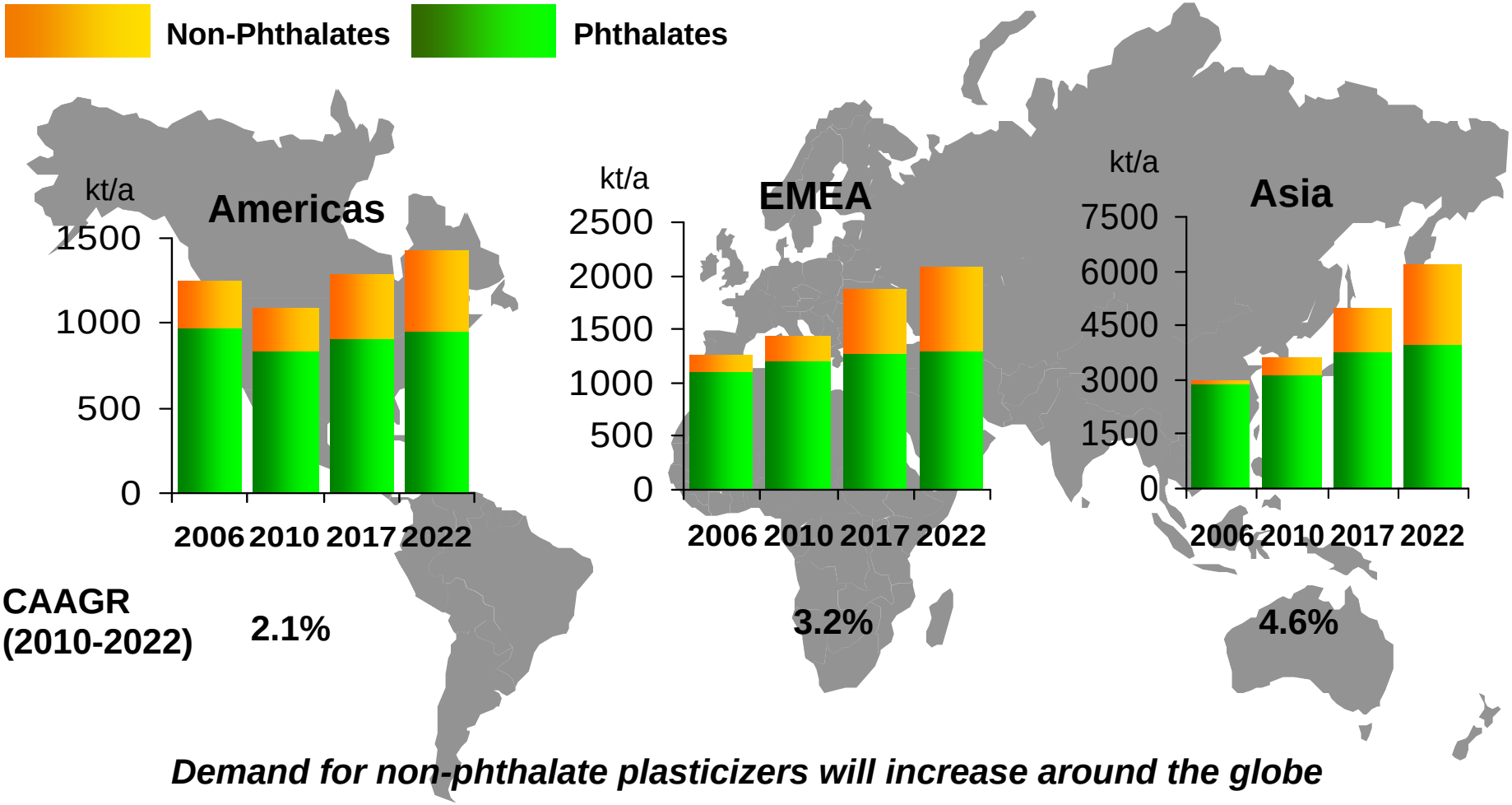
Aspects Effecting Plasticizer Growth

	North America	Western Europe	Asia
Politics, legislation	Neutral to negative PVC considered as versatile, “phthalate issue” discussions increasing	Negative PVC and phthalates under pressure, replacements pursued actively	Neutral to positive PVC and phthalates gaining marginal attention, mfg growth oriented policies
Demographics	Positive 475 Mio., ~ 0.97 % population growth	Neutral 450 Mio., limited population growth, aging population	Positive 4000 Mio., 1.2 % growth, young & growing population
Economic structure	Negative Manufacturing less a driver of the economy, Asian imports replace domestic production (USA)	Neutral Migration of some manufacturing to Far East is partially off-set by CEE and MEA growth. Strong manufacturing base	Positive Strong manufacturing and increasing exports / domestic consumption
Expected consequences for growth	Plasticizer demand will grow but less than GDP **GDP (2010-15): 3.3 % CAGR**	Plasticizer demand will grow slowly approx 1.5% **GDP (2010-15): 2.4 % CAGR**	Plasticizer demand will grow with GDP **GDP (2010-15): 7.7% CAGR**

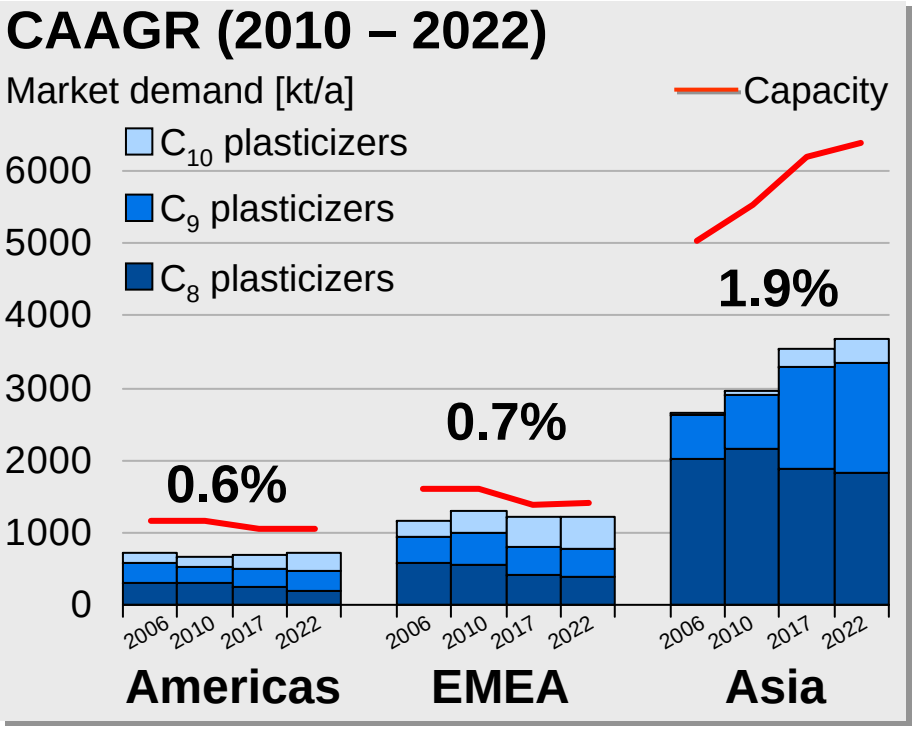
Growth around GDP. Phthalates remain dominant.



Demand for non-phthalate plasticizers will increase around the globe

Source: SRI, CMAI, BASF estimates

C9 and C10 phthalates will remain key products



Demand:

- C9 and C10 phthalates growing at expense of C8 (DEHP)

Supply:

- EMEA/Americas: sufficient capacities available, capacity reductions expected
- Asia: high plasticizer overcapacities (2.2 Mio. t in 2010)

➔ ***Currently available capacities sufficient to cover projected future demand***

Source: SRI, CMAI, BASF estimates

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World Plasticizer Market 2010

A Global Perspective

%	USA	Western Europe	Asia
DOP	19	16	60
C9/C10 Phthalates	33	63	21
Linears/other Phthalates	19	6	9
Non-Phthalates	28	16	10
TOTAL	100	100	100

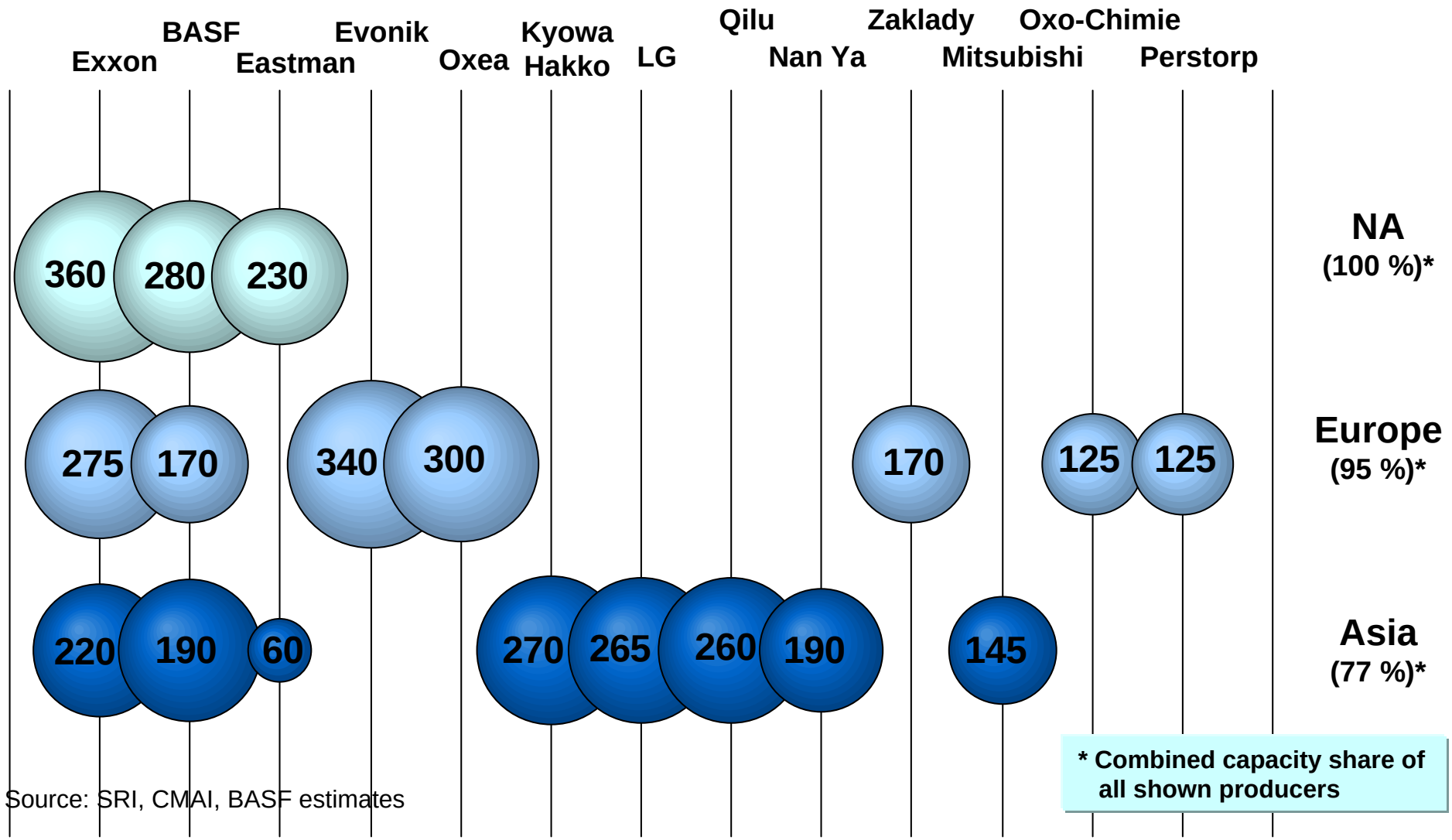
Source: SRI, CMAI, BASF estimates

Trends:

- DOP replacement by C9/C10 phthalates.
- Selection of alternative plasticizers for sensitive applications will continue.
- Activists pressure on PVC and phthalates requires increased efforts on advocacy.
- Asia has 65% of the global Plasticizer capacity - the key driver for future growth is Oxo capacity.
- Access to C8 - C10 plasticizer alcohols key success factor.

Major Global Manufacturers of Alcohols 2010

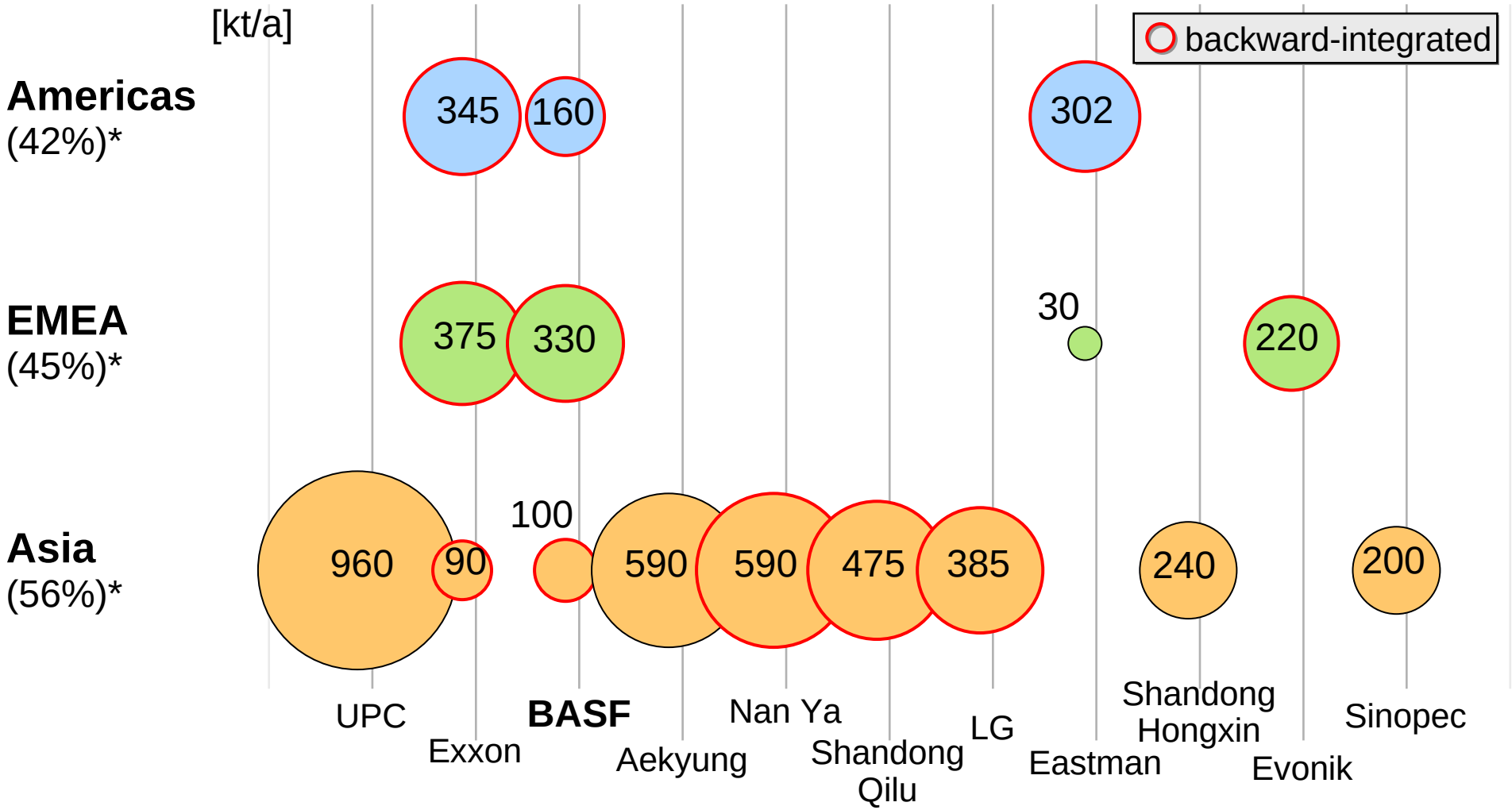
C8-C10 Plasticizer Alcohols



Source: SRI, CMAI, BASF estimates

* Combined capacity share of all shown producers

Major Global Producers of Plasticizers 2010



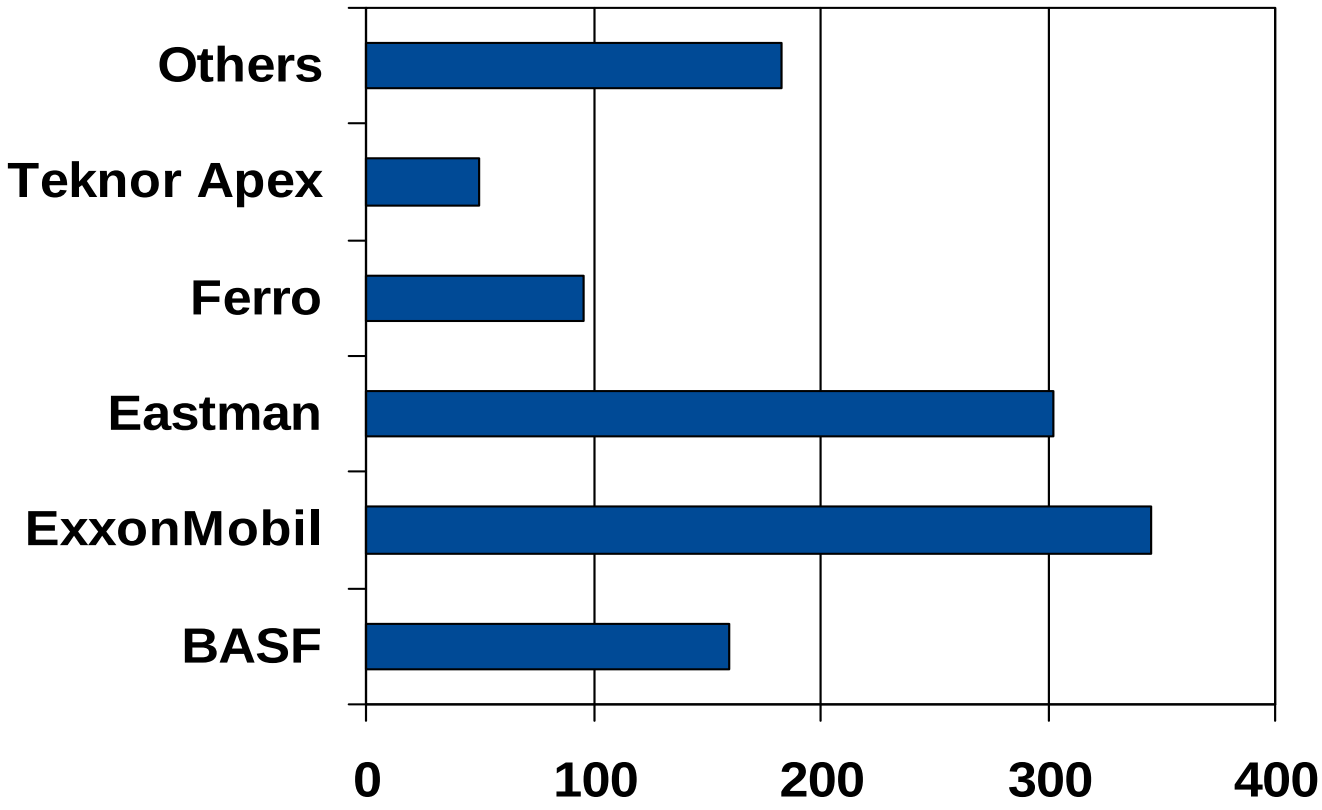
* Cumulative capacity share of shown competitors

Source: SRI, CMAI, BASF estimates

North American Plasticizer Market

Plasticizer Producer Summary (Published Capacities)

Published Ester Capacities NA (name-plate [kt]):

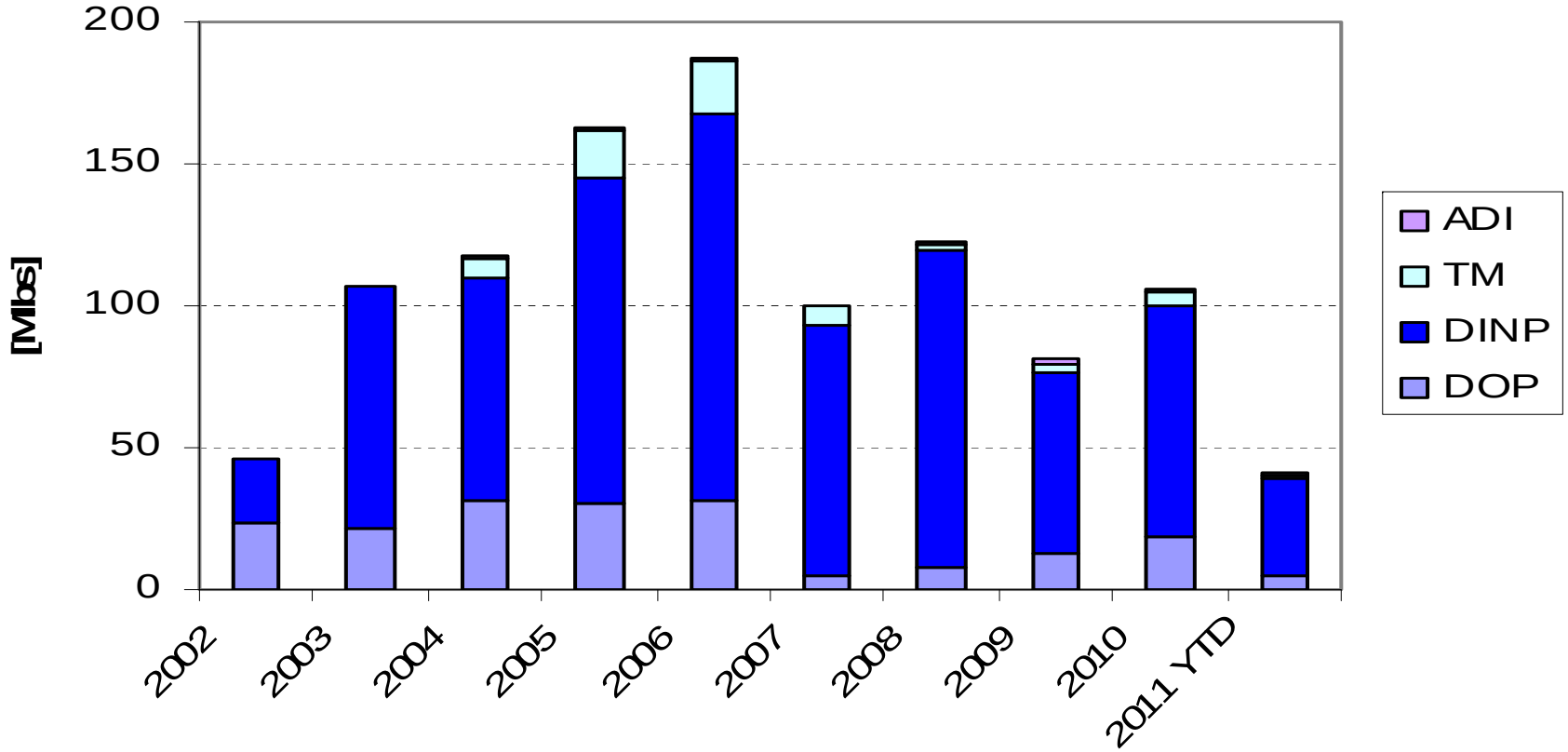


- Market consolidations occurring in NA

Source: SRI, CMAI, BASF estimates

Plasticizer Imports into US

2002 – YTD

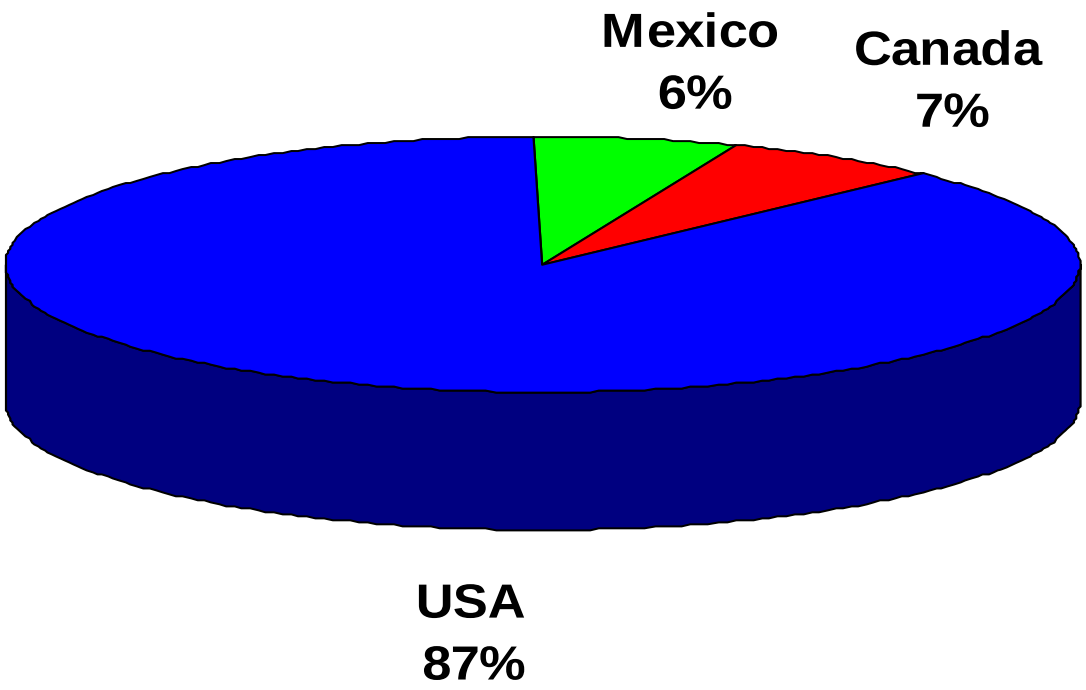


- DINP is major imported plasticizer
- Regional arbitrage or regional shortages drives trade balance

Source: SRI, CMAI, BASF estimates

North American Plasticizer Market

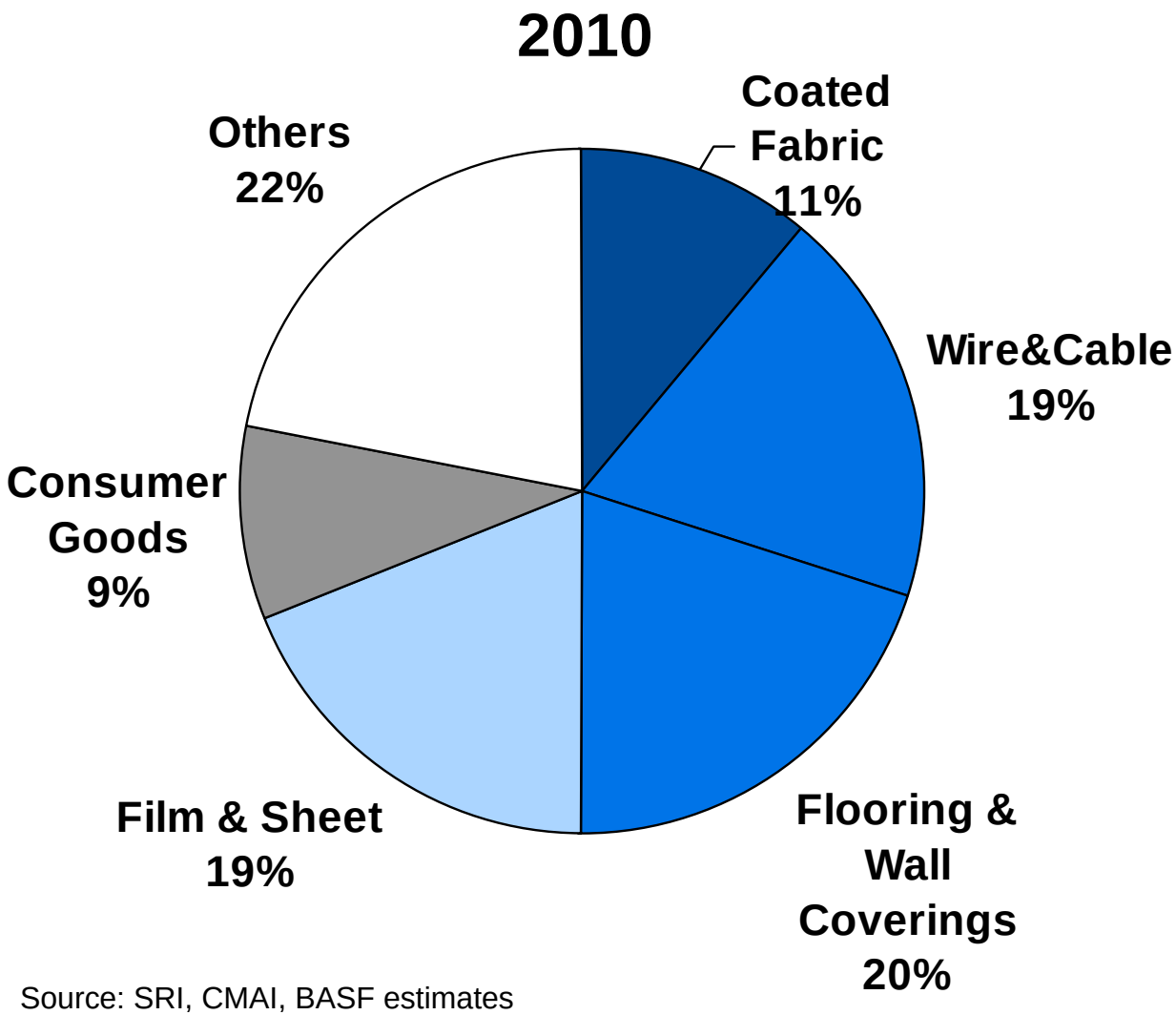
Relative Market Size



0.8 Mio. t

Source: SRI, CMAI, BASF estimates

Plasticizer End Use Applications



Source: SRI, CMAI, BASF estimates

Trends

- Wire & Cable and Flooring weak due to housing market
- Gradual shift in medical applications from DOP to alternatives expected

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Phthalate Esters Issues Update

- CPSC Chronic Hazard Advisory Panel – phthalates and alternative plasticizers (complete in late 2012)
- EPA Chemical Action Plan
  - TSCA 5(4)b "chemicals of concern" proposal – in review by OMB since May 2010. Strong support by SPI, VI, ACC, RFCI, and others
  - EPCRA 313 Toxic Release Inventory – add new phthalates (2011/2012)
  - Design for the Environment (DfE) assessment – starts in August 2011. EPA: non-regulatory way to move away from phthalates
  - Further action – possibly in 2012 with input from CPSC, FDA, and EPA assessments
- REACH – major high molecular weight phthalates, DINP, DPHP, DIDP have been registered and are not subject to authorization

BASF Global Production Facilities

for Plasticizer and Plasticizer Raw Materials (as of Jan 2011)

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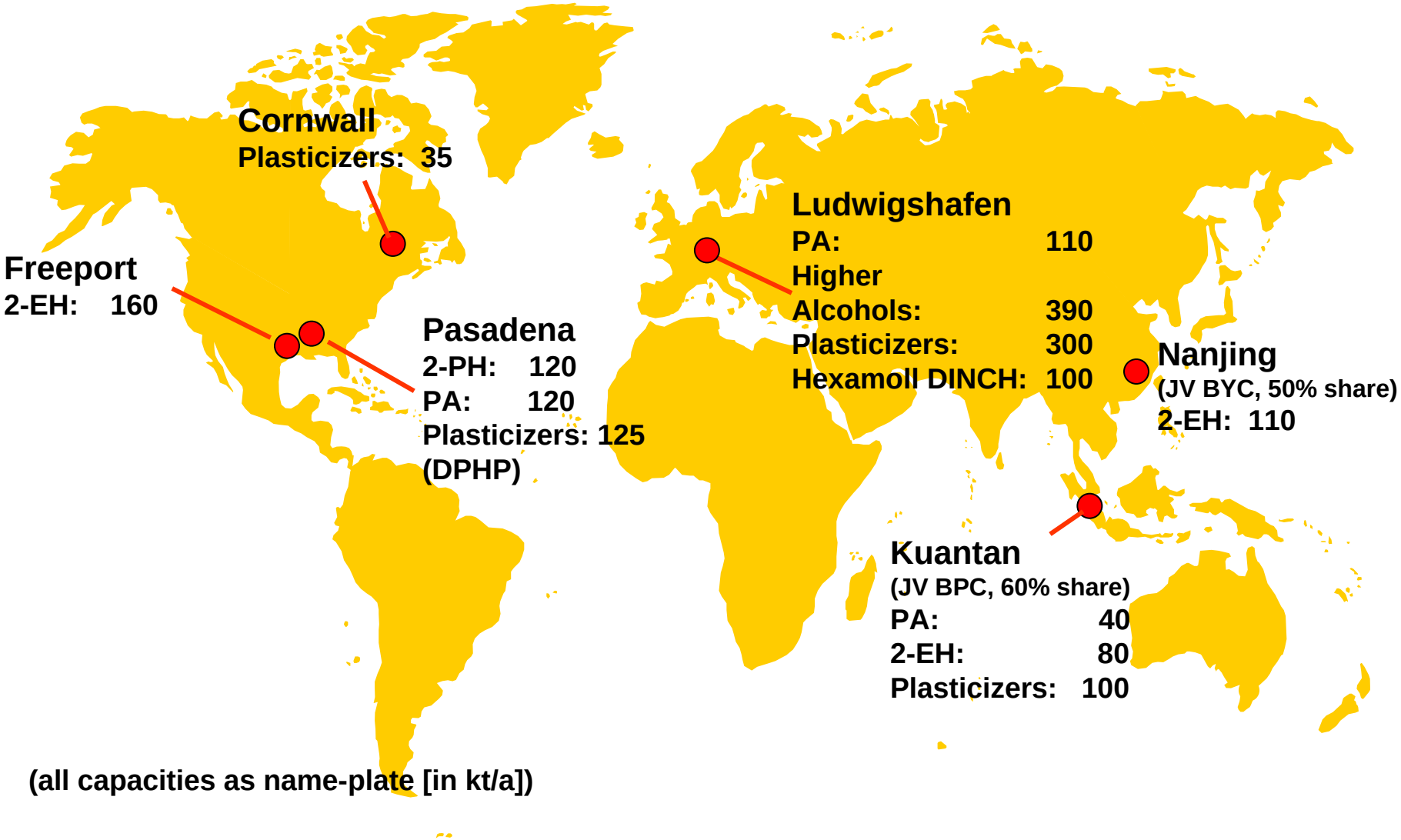

(all capacities as name-plate [in kt/a])

BASF Plasticizers North America

Manufacturing Structure

2-PH	120 kt/a
Phthalic Anhydride	120 kt/a
Plasticizers	125 kt/a

Specialty Plasticizers 35 kt/a

Main Terminal for NE customers

Oxo-C4	300 kt/a
thereof 2-EH	160 kt/a

Houston Area

(all capacities as name-plate [in kt/a])

BASF Plasticizer Portfolio North America

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Branched Phthalates

for cost-sensitive applications

- **Palatinol® DPHP (C10)**
- **Palatinol® N (C9)**

Specialty Linear Phthalates

for improved low- and high-temp performance

- **Palatinol® 610P**
- **Palatinol® 911P**
- **Palatinol® 111P (DUP)**

Non-Phthalates

for highly sensitive applications

Hexamoll® DINCH

Polymerics

for low migration applications

- **Palamoll® 652**
- **Palamoll® 654**
- **Palamoll® 656**

Adipates

for improved low temp performance

- **Plastomoll® DOA**
- **Plastomoll® DNA**

Trimellitates

for improved high temp performance or use in medical (non P)

- **Palatinol® TOTM**
- **Palatinol® 610TM**

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Plasticizers
Outlook

- Asia is and will remain the dominant consumer of plasticizers – Oxo alcohol availability is the key driver for plasticizer growth.
- Post economic recovery, plasticizer demand in North America expected to grow slowly at ~2.0 % CAGR.
- Politics and legislation on PVC and phthalates will continue to require increased advocacy.

BASF remains highly committed to plasticizers and plasticizer raw materials as a core business globally.

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Thank You!