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EMERGING AUTOMOTIVE, CRUDE OIL, AND CHEMICALS SUPPLY CHAINS IN THE US SOUTHEAST

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Overview of Discussion Topics

Supply Chains

Automotive

Crude Oil

Chemicals

Trends & Issues

Panama Canal

Shale Oil & Gas

**Reshoring &
Nearshoring**

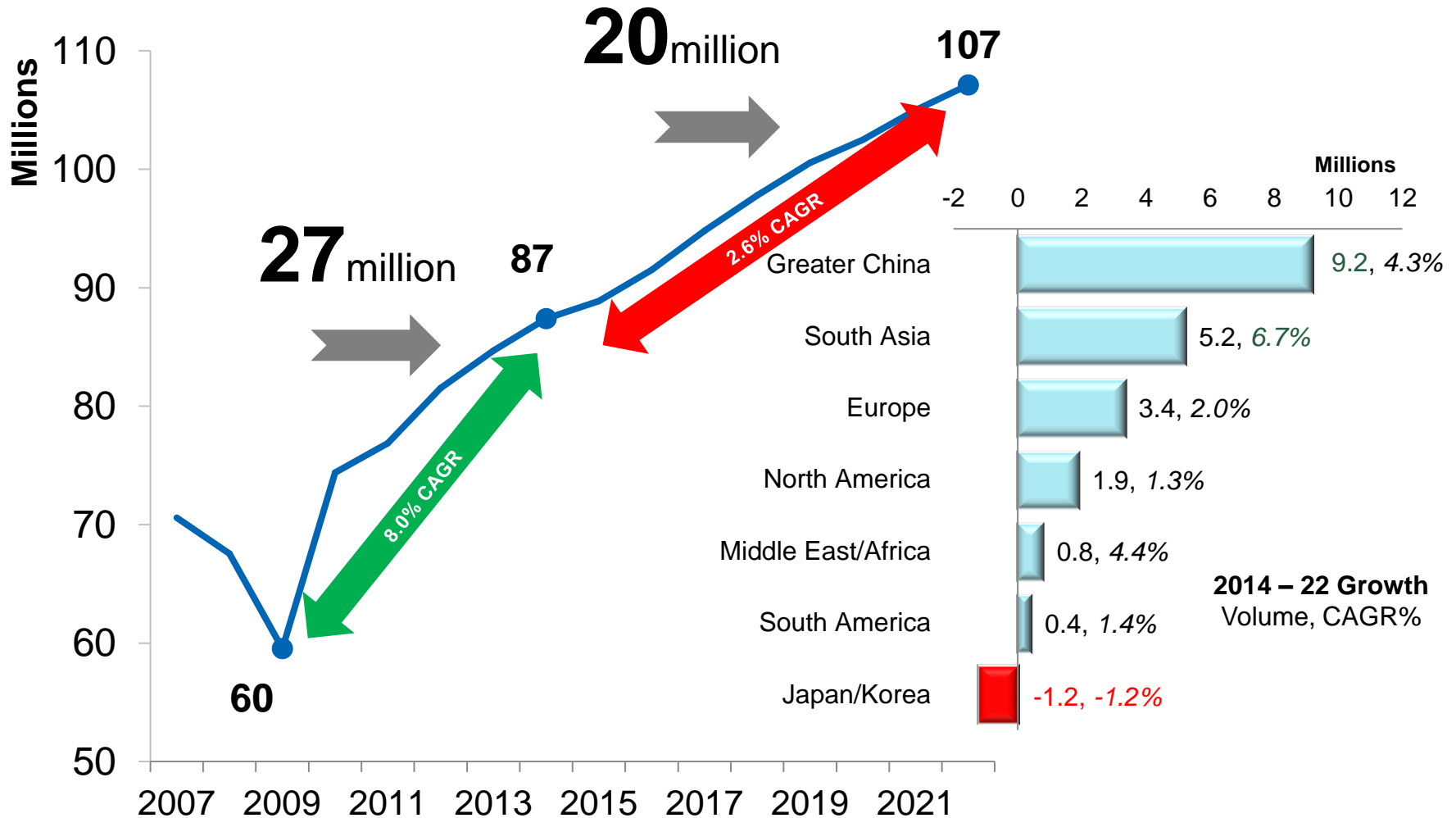
Automotive Trends

- China, India, and Germany auto manufacturer production grows rapidly
- North America auto manufacturing production grows steadily, but Japanese and Korean companies see declines
- Reshoring of automobile manufacturing to North America
- Southward migration of production towards the US Southeast and Mexico
- Increased rail shipments of new vehicles from Mexico to the US and Canada
- Long-term co-location of suppliers near manufacturing sites
- Panama Canal: Larger ships, less transits, relatively flat unit throughput



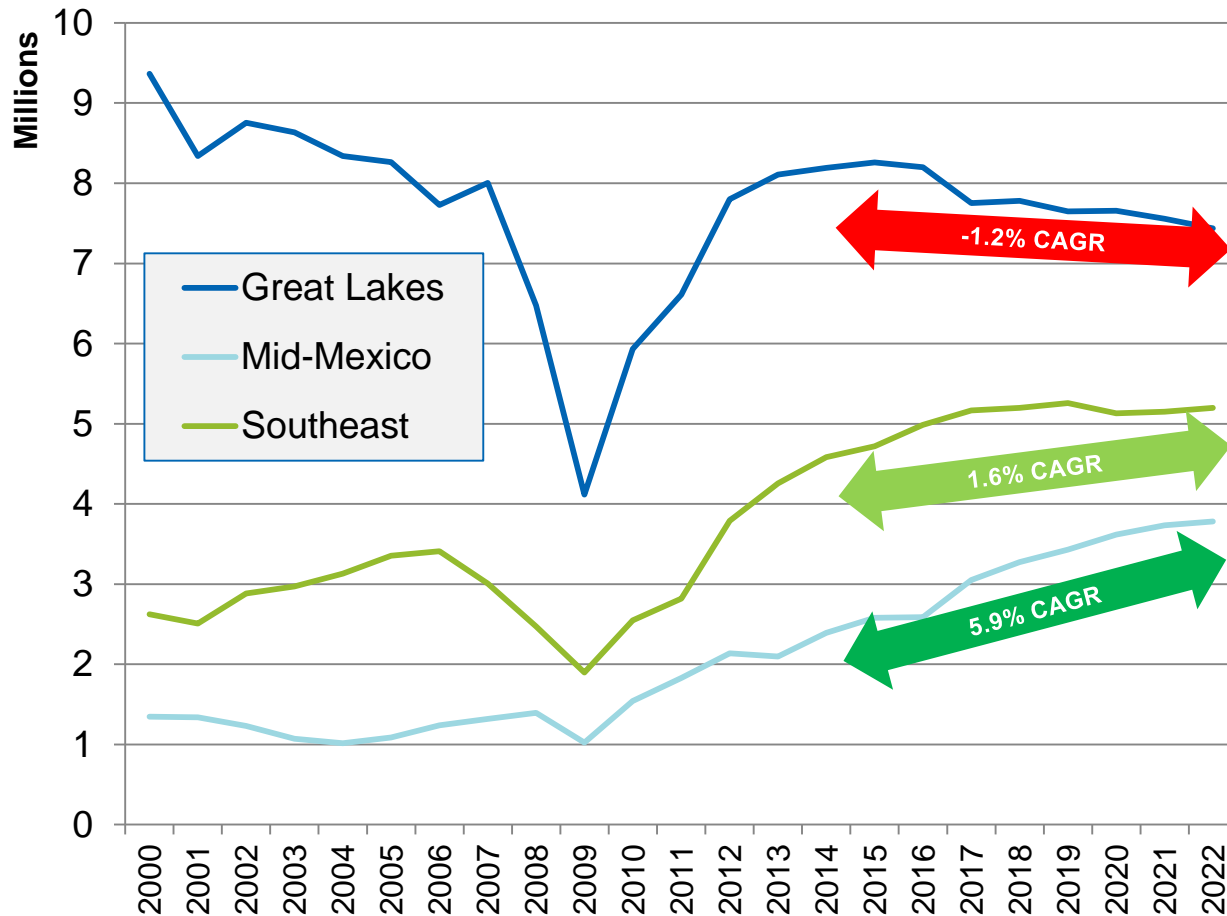
Global Light Vehicle Production

Global Growth Takes a Turn



Three Distinct NA Production Clusters Compete

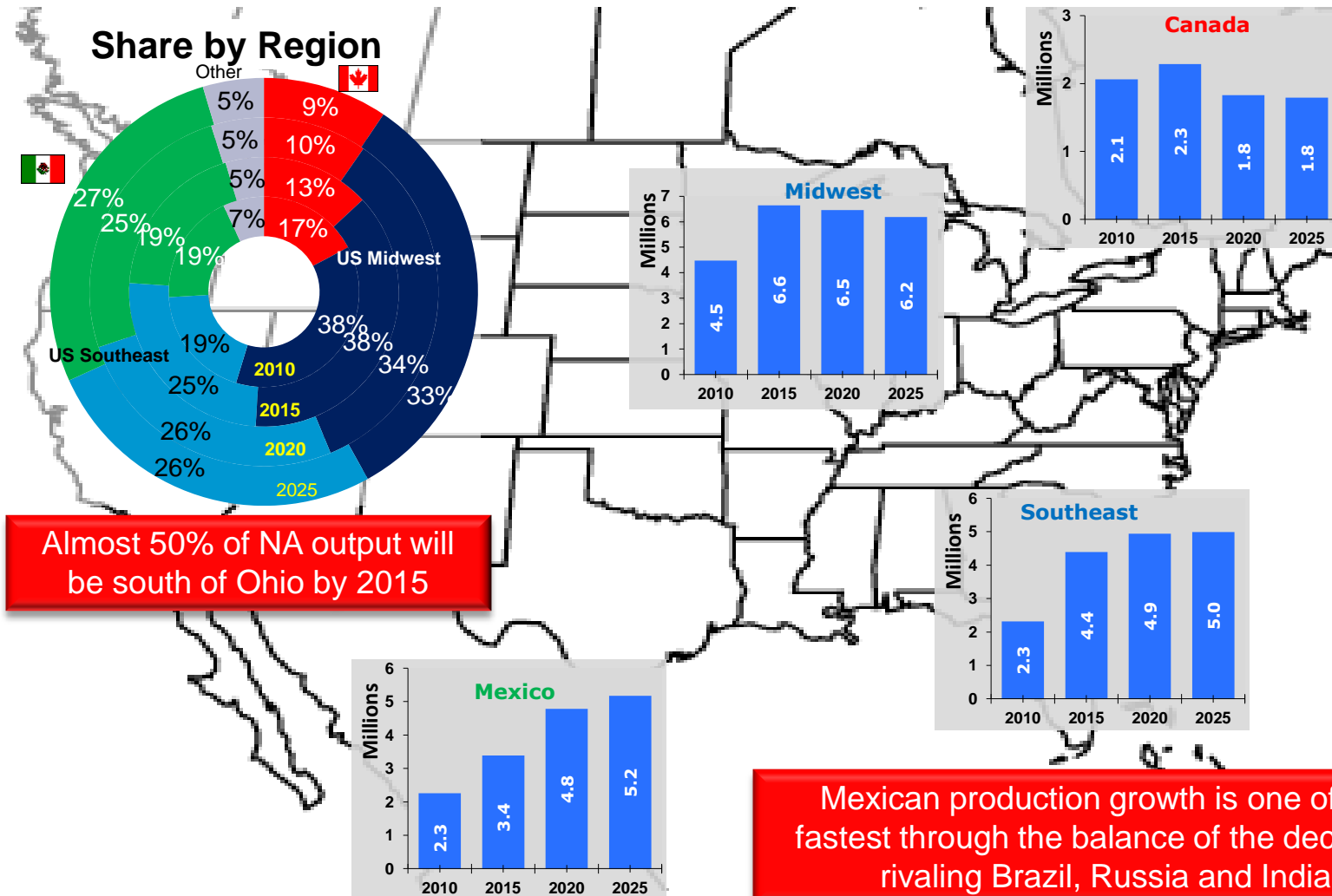
Logistics Cost Reduction in Focus



- Great Lakes driven by installed capacity shifting to 3 crew/3 shift structures to reach +7 million units
- Southeast reaching a formidable level of +5 million units by 2017 with virtually every NA OEM resident
- Mid-Mexico rises to ~4 million units by 2022 as new capacity, diversified demand and supplier investment act as enablers

NAFTA Output By Region

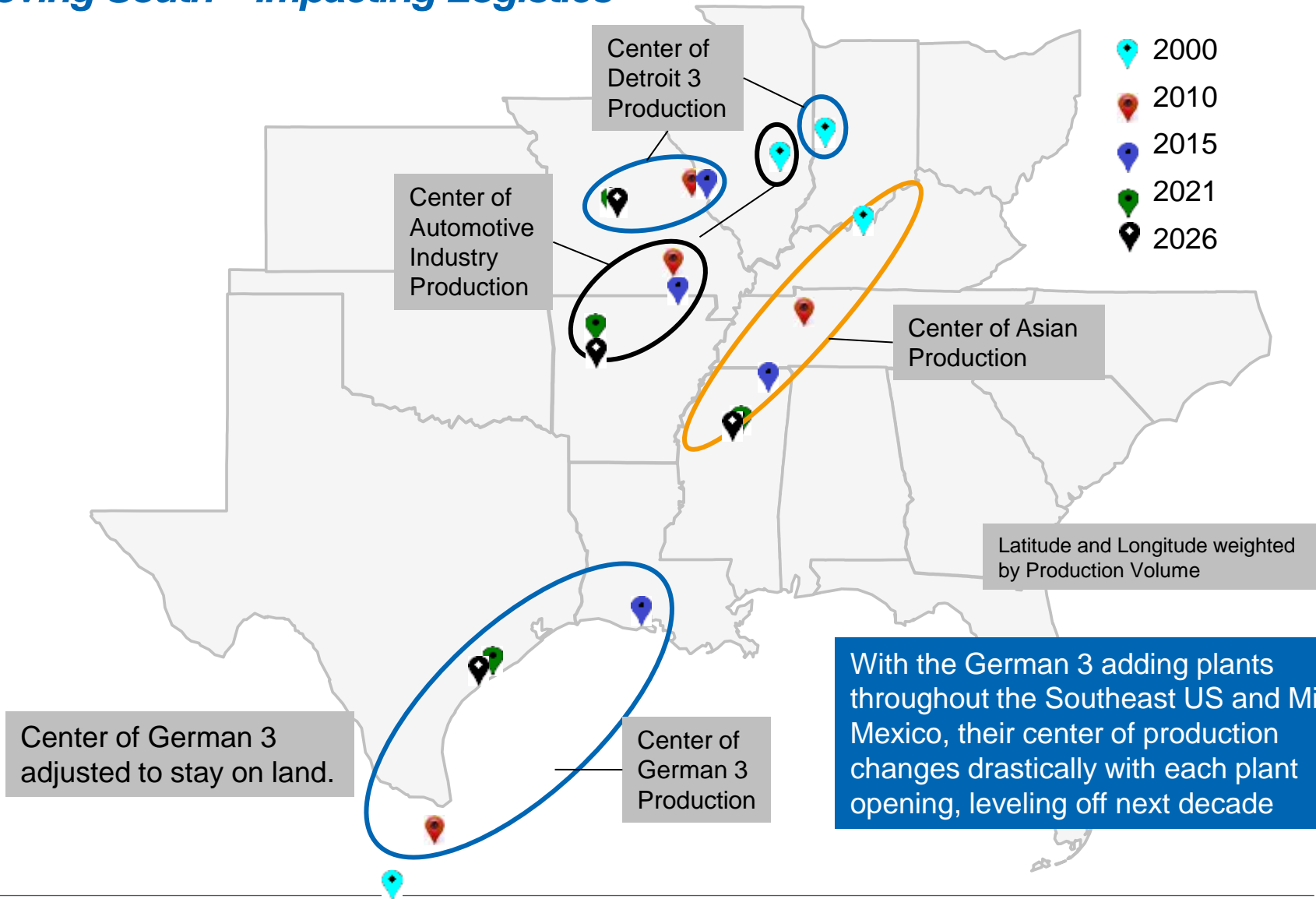
Shifting Towards the US South & Mexico



Almost 50% of NA output will be south of Ohio by 2015

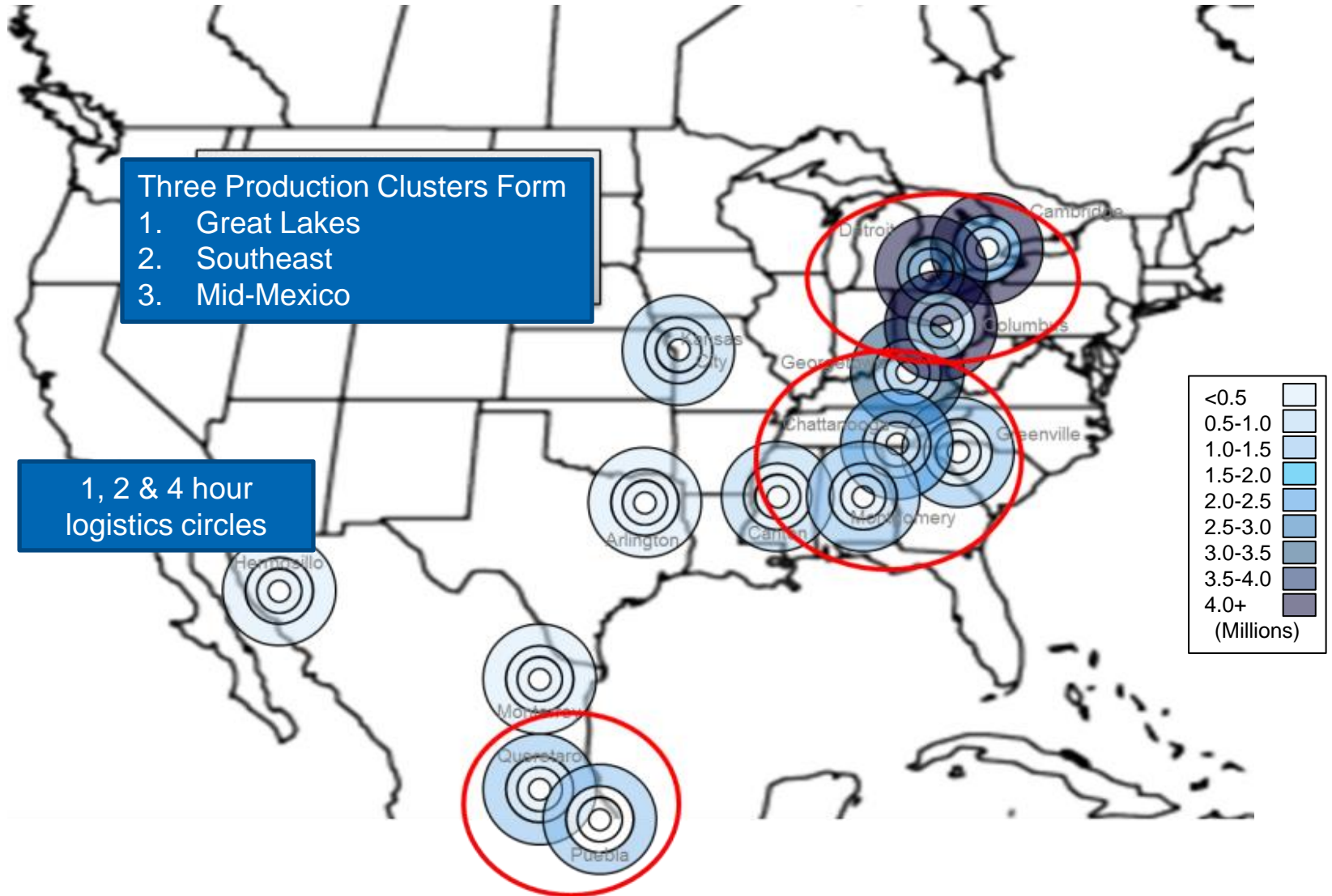
Mexican production growth is one of the fastest through the balance of the decade – rivaling Brazil, Russia and India

Center of Automotive Industry Moving South – Impacting Logistics



Light Vehicle Production Locational Analysis

2015 – Three Clusters Form

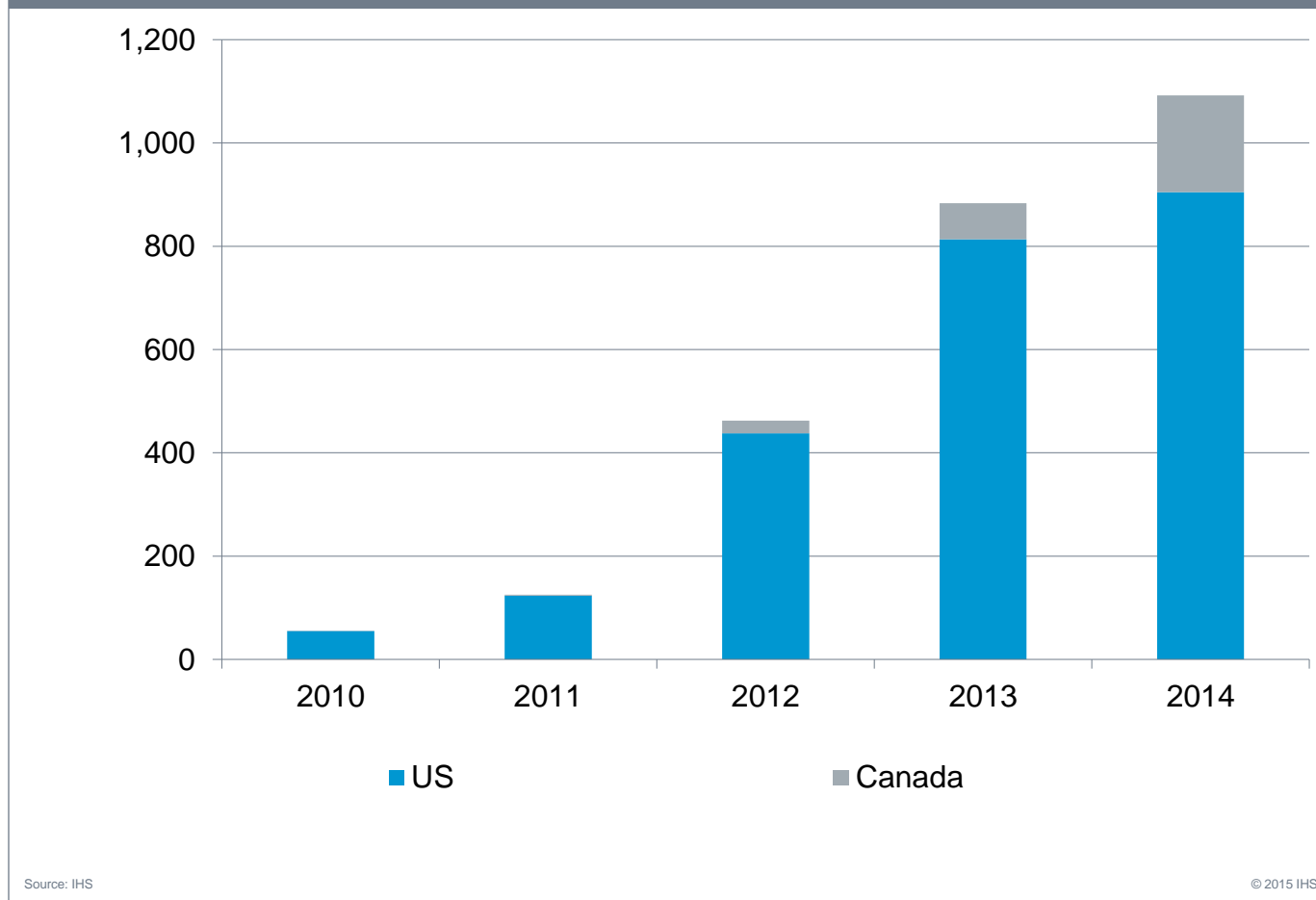


Crude by Rail (CBR)

- Avg. Brent to \$54/barrel (bbl) and West Texas Intermediate (WTI) to \$49/bbl.
- Short-term US production declines by up to 1 million barrels per day (bpd)
- US shale operations lower costs to remain competitive
- Bakken/Canada CBR persists to US Northeast & Northwest
- Canada pipelines proposals may divert some crude after 2020, but rail still remains competitive to US NE/NW
- Pipeline infrastructure expansion could affect southbound CBR
- Panama Canal: No major impact on global crude oil flows

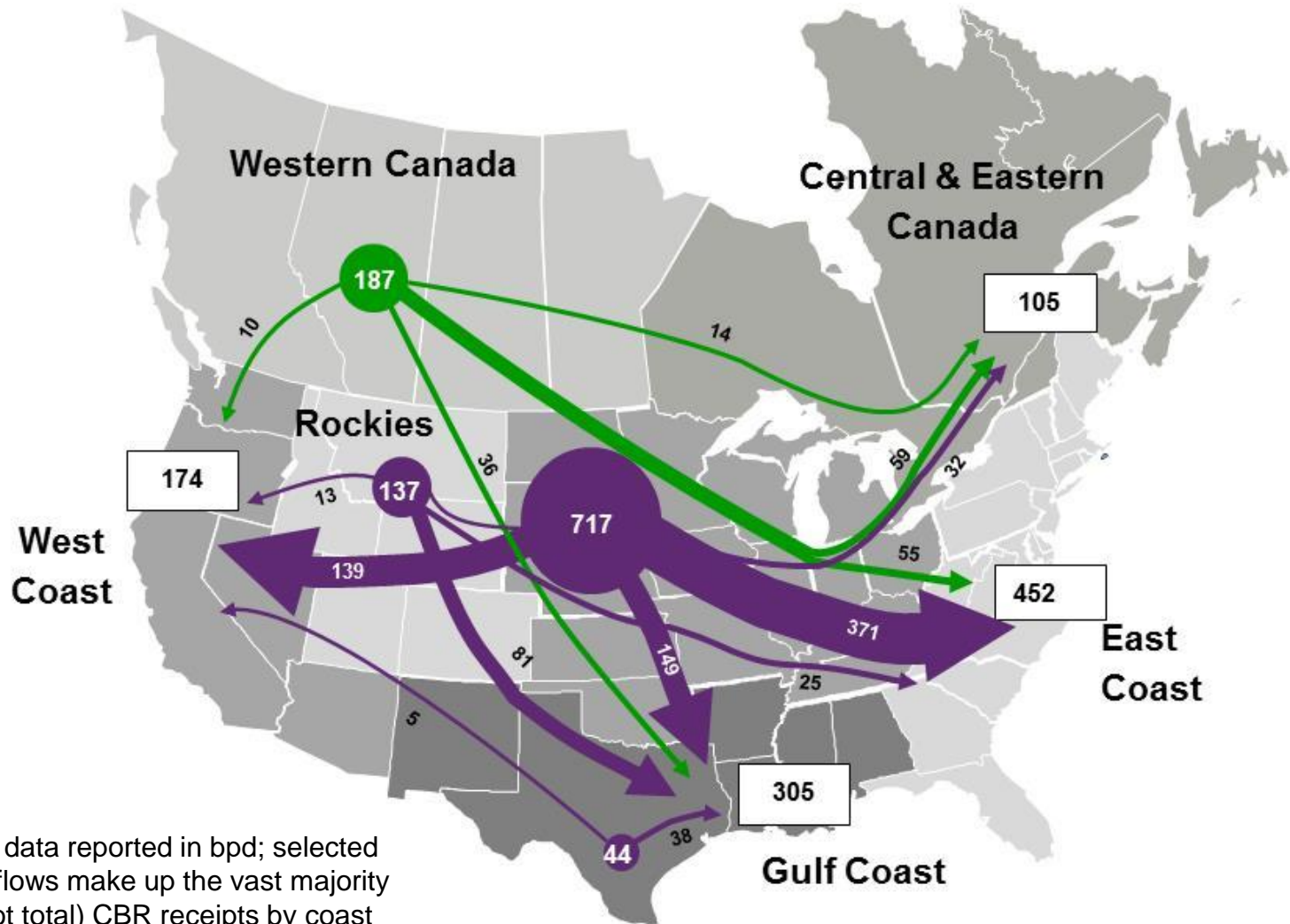
Crude by Rail Reaches New Heights in 2014

North American Crude-by-Rail Movements (thousand bpd)



Crude by Rail

*Downside risk primarily for Bakken/Canada flows to the US Gulf Coast **



*Note: data reported in bpd; selected origin flows make up the vast majority (but not total) CBR receipts by coast

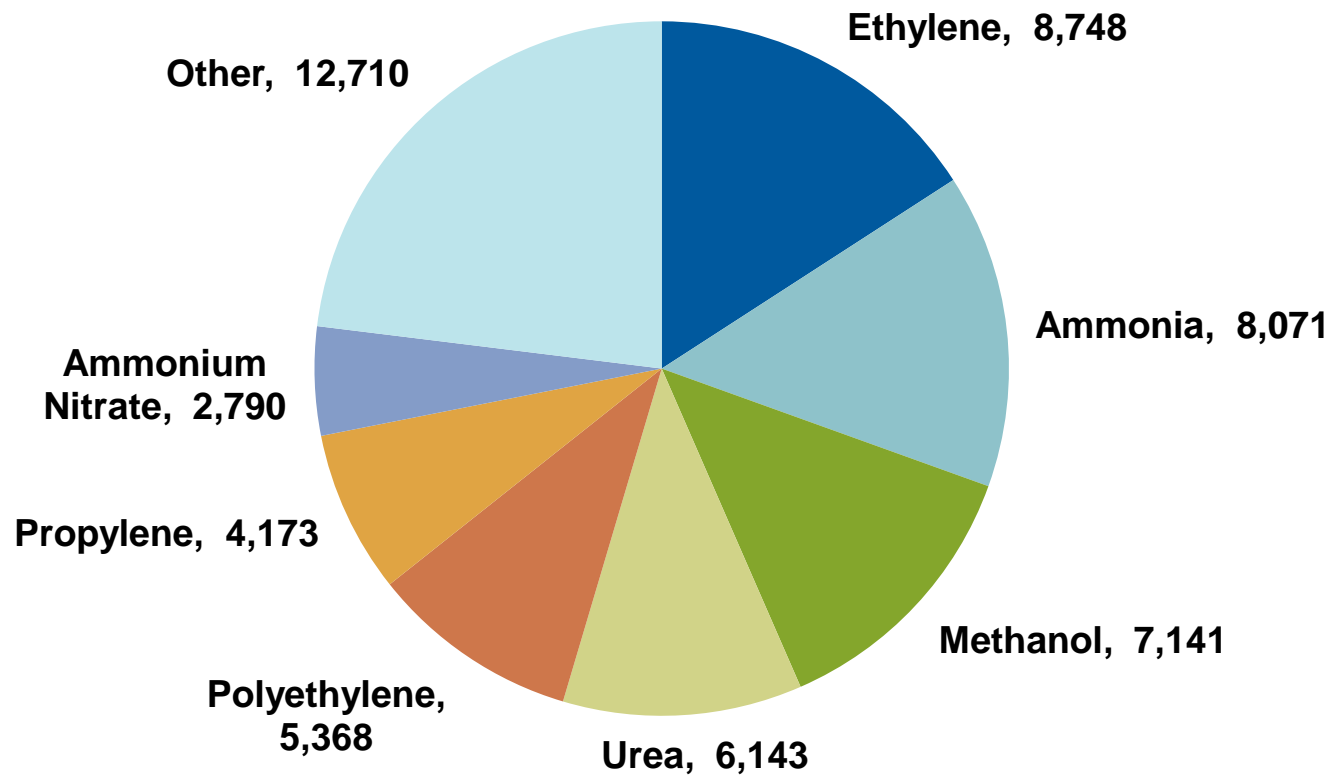
Chemicals

- US chemicals manufacturing rebounding due to low-cost domestic feedstocks
- US shale provides low-cost natural gas (NG) and natural gas liquids (NGL) used as chemicals building blocks
- Asia demand and Panama Canal expansion supports NG/ NGL development
- About 90% of all new chemicals manufacturing and export will occur in the US Gulf Coast region
- Impacts of changes in production, imports, and exports will alter chemicals supply chains
- Impacts will vary based on chemical group

US Chemicals Manufacturing

US manufacturing expands dramatically due to low-cost feedstocks

US Chemicals Manufacturing Expansion, 2014-2020 (million metric tons per year)

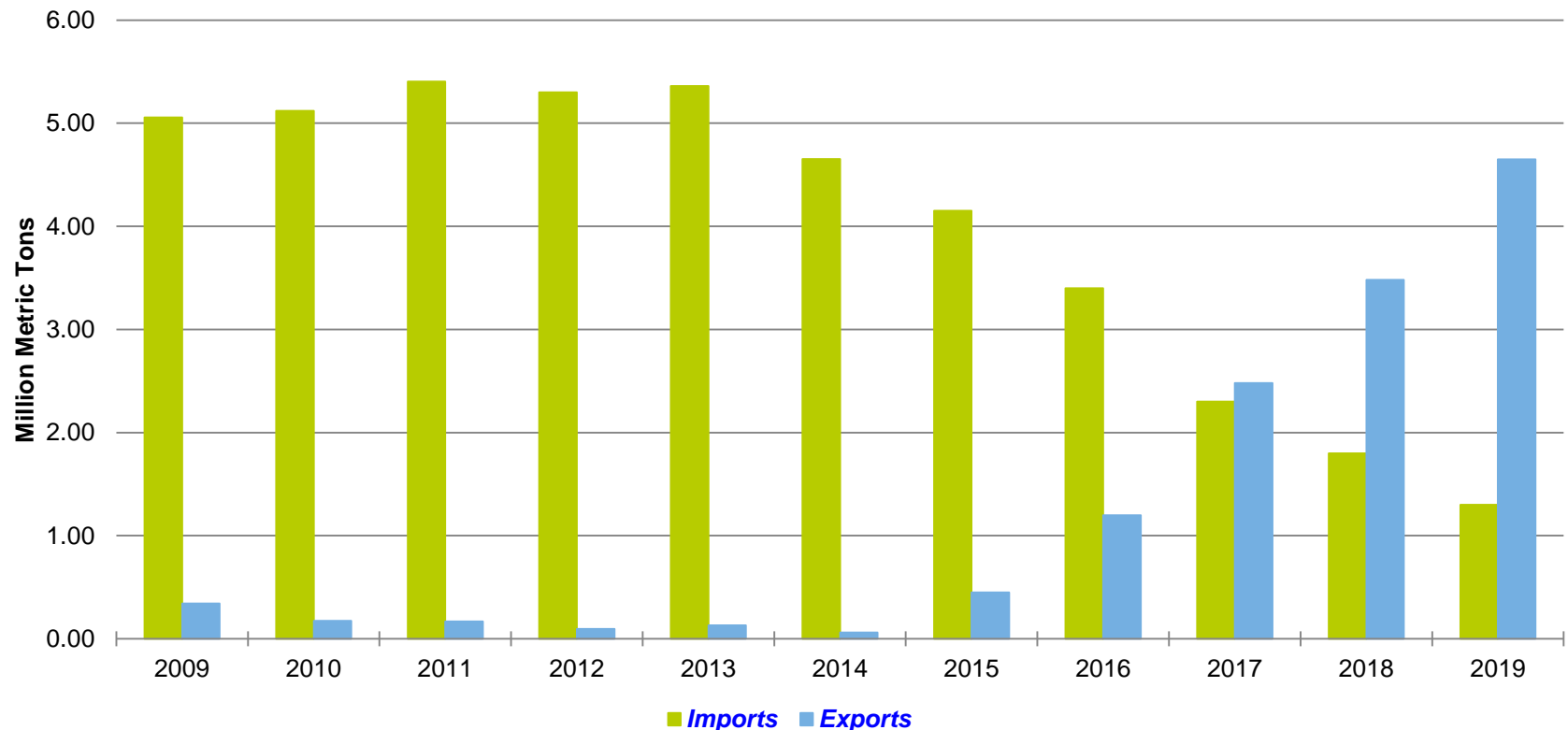


Source: IHS

US Chemicals Manufacturing Resurgence

US experiences net positive impact on many exports (e.g., Methanol)

United States Methanol Net Trade



Source: IHS

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