



Oak Creek Investments LLC



PANEL & ENGINEERED  
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# The Wood Panel Industry in China and Its Impact on the U.S. and the World

Presented by:  
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Atlanta GA

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# About the Presenter

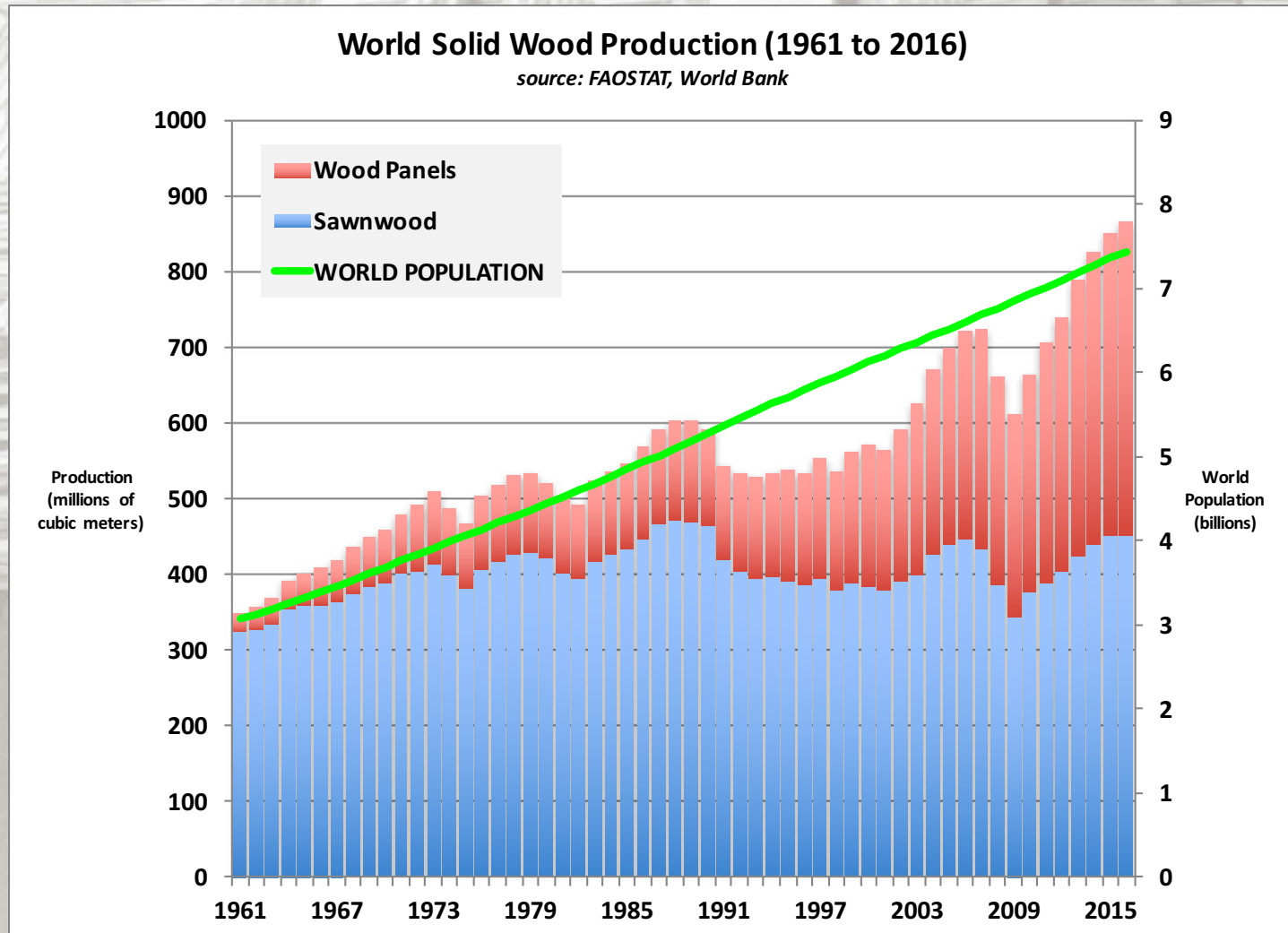
- Currently CFO/Treasurer of Oak Creek Investments (partner in Winston Plywood & Veneer and other wood & non-wood businesses) and Consultant for Georgia Research Institute (“GRI”)
- Previously credit analyst positions at two Wall Street firms
- Recent consulting projects (mostly in partnership with GRI):
  - Analysis of a non-wood substitute for wood structural panels
  - Study for Asian manufacturer analyzing expansion in N.A.
  - Marketing study for European panel manufacturer analyzing expansion into U.S.
  - Ongoing analysis of panel & EWP markets in China
  - Due diligence for CalAg MDF plant now under construction
  - Initial business plan for Winston Plywood & Veneer
  - Allegations of dumping of Chinese hardwood plywood
- BS (Finance, Chemistry), U of Oregon; MBA (Investment Analysis), Boston U

# Panel Products covered in Presentation

- MDF/HDF
- OSB
- Particleboard
- Plywood
  - Hardwood
  - Softwood

*Mostly focus on substantial export industries from China (MDF and Plywood)*

# Global solid wood volume



Over long-term, solid wood volume growth highly correlated with population growth



# Summary: Global Panel Products

Global Panel Production					
2016					
unit: m <sup>3</sup> x 1000					
	World Prod. (m <sup>3</sup> )	China as % of World	Europe as % of World	N.A. as % of World	Other as % of World
MDF/HDF	98,981	59.7%	16.0%	4.0%	20.3%
OSB	34,254	2.0%	23.8%	59.1%	15.1%
Particleboard	92,334	27.9%	47.2%	6.4%	18.6%
Plywood	159,437	73.6%	5.5%	7.4%	13.6%
<b>TOTAL</b>	<b>385,006</b>	<b>52.7%</b>	<b>19.8%</b>	<b>10.9%</b>	<b>16.7%</b>
source: FAO					

# Rise of Chinese Panel Industry

- While global panel production has grown by 200% since 2006, Chinese volume has grown by more than 2000% over past 20 years. More than half of global panel production now takes place in China.
- At least 90% of panels are consumed domestically for manufacturing & construction
- MDF, PB, and Plywood are inputs in important manufacturing industries such as furniture and cabinetry, some of which is in turn exported
- An impediment to further production growth is wood fiber availability



# Highlights of Chinese Panel Industry

- Possibly 800 MDF, 1400 particleboard, and 5000 plywood mills, so average mill is low volume by U.S. and European norms
- Large wood manufacturing industry aids social stability by employing sizable workforce
- Wood industry focused in Coastal provinces connecting Beijing, Shanghai, & Hong Kong





# Technology spectrum in Panel production



## **LOW TECHNOLOGY**

Air-drying eucalyptus veneer in China

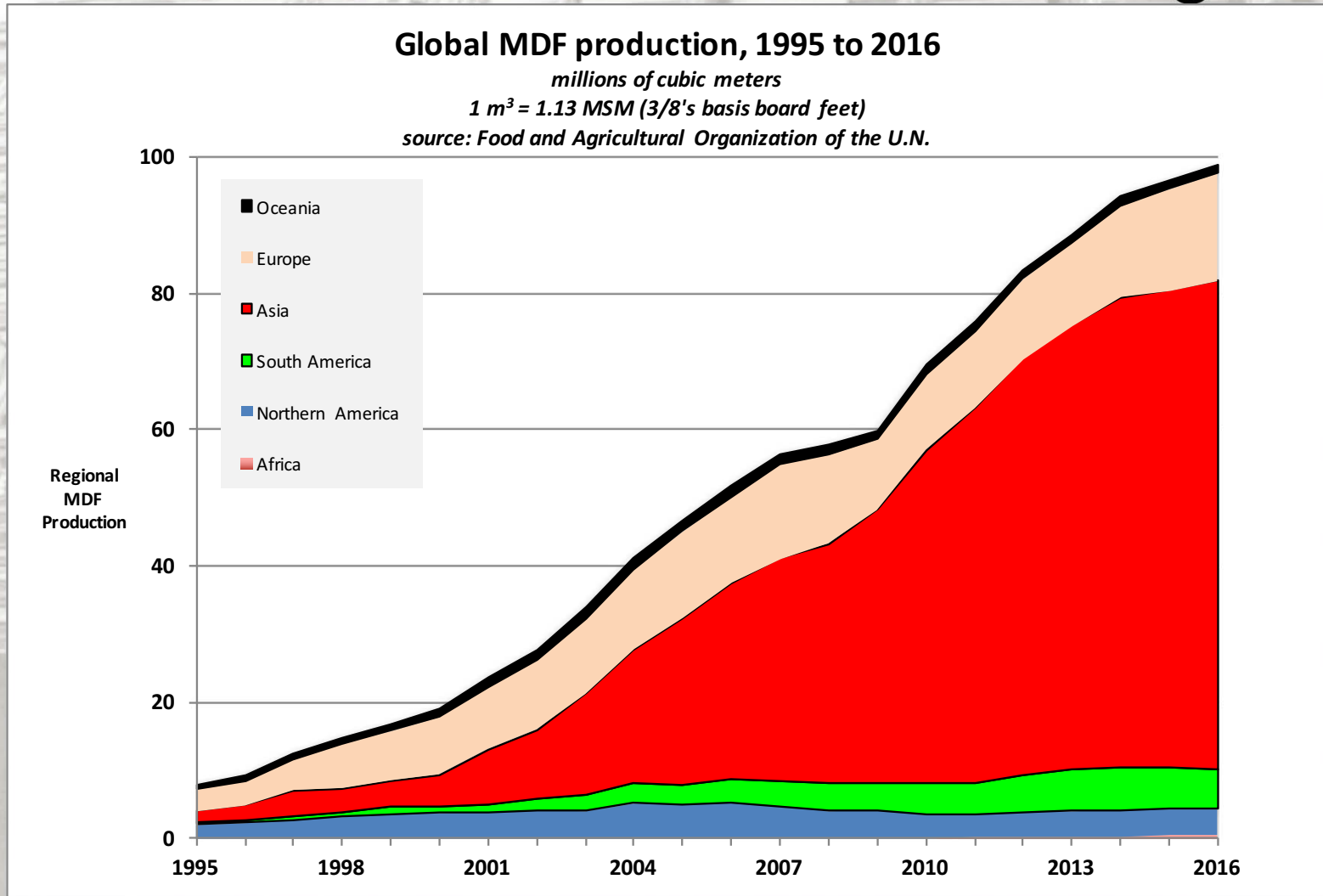


## **STATE-OF-THE-ART**

Continuous Press at BaoYuan OSB plant in Jingmen City, Hubei Province, China



# Global MDF Volume is Increasing



China surpassed the U.S. in 2001 and Europe in 2004, and now is by far the leading producer

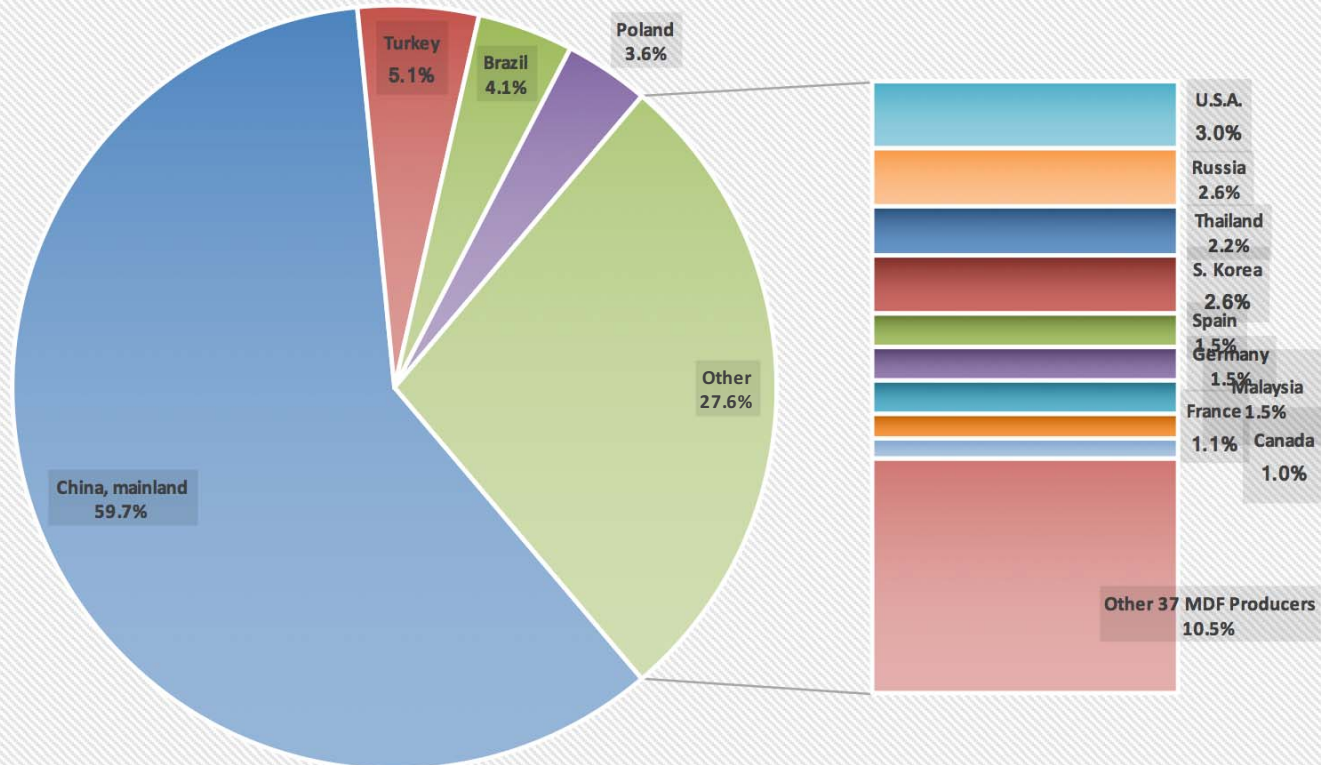
# Global trade in MDF

- International MDF trade doubled to \$6.4 billion in 2016 from \$3.2 billion in 2003;
- However, similar to plywood, international trade has been flat for past 5 years;
- In 2016, total MDF exports from China = 2.65 million m<sup>3</sup>, including 1.09 million m<sup>3</sup> to U.S.;
- In 2017, the U.S. MDF trade deficit was \$872 million (\$976 million in imports offset by \$104 million in exports).



# China 3/5s of global production

Global MDF Production Share, 2016  
Total Production = 99,000 million m3  
Countries w/ production > 1,000 million m3 are itemized.  
source: FAO of UN

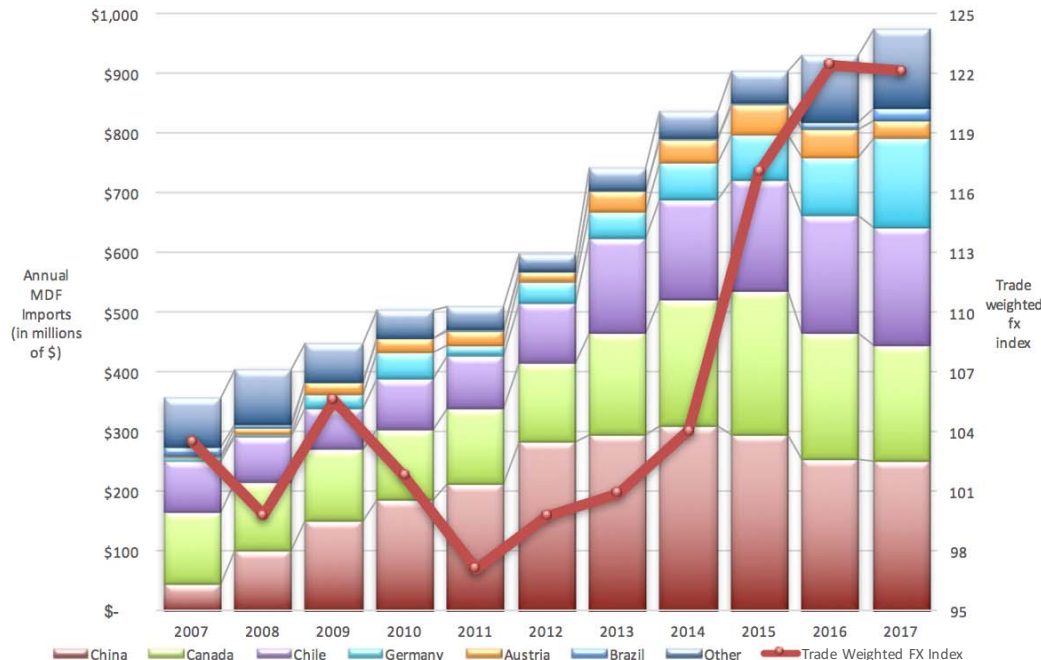


About 95% of Chinese MDF production is for domestic use & remanufacturing, but that still leaves a lot of MDF to export

# MDF exports to U.S.

**MDF Imports (Country) vs. USD Exchange Rate  
2007 to Dec. 2017**

source(s): Foreign Agricultural Service, St. Louis Fed



- § *MDF imports highly correlated with strength of the USD*
- § *Chinese MDF imports were \$250 million in 2017 and \$254 million in 2016, compared to \$294 million in 2015*
- § *Chinese imports focused on lower unit-value thick panels; higher value thin panels are focus of some other countries*

Trade-Weighted FX Index: Weighted average of the foreign exchange value of the U.S. dollar against the currencies of a broad group of major U.S. trading partners per the Federal Reserve Bank of St. Louis. Broad currency index includes the Euro, **Canada**, Japan, Mexico, **China**, United Kingdom, Taiwan, Korea, Singapore, Hong Kong, Malaysia, **Brazil**, Switzerland, Thailand, Philippines, Australia, Indonesia, India, Israel, Saudi Arabia, Russia, Sweden, Argentina, Venezuela, **Chile** and Colombia.



# Status of Formaldehyde rules for Composite Panels & Hardwood Plywood

- CARB 2 rules had become the de-facto U.S. standard.
- In July 2010, President Obama signed the Formaldehyde Standards for Composite Wood Products Law that applied TSCA Title VI (virtually equal to CARB 2) to entire U.S.
- Law originally intended to become effective in February 2017
- Under President Trump implementation had been postponed several times until Dec. 2018
- However, a Federal Court ratified a settlement between the Sierra Club and EPA that sets compliance date at June 1, 2018
- Chinese labs already designated by EPA as 3<sup>rd</sup>-Party Certifiers

# Comparative Formaldehyde Regulations

## COMPARATIVE FORMALDEHYDE EMISSIONS STANDARDS (in ppm)

	CARB-2 / TSCA Title VI	E2: GB18580- 2001	F** / E1 / GB18580- 2017	F*** / E0	PROY-NOM- 203-SCFI- 2014
Hardwood Plywood	0.05	0.38	0.143	0.07	
MDF (thicker than 8 mm)	0.11	0.38	0.099	0.07	0.21
MDF (equal to or less than 8 mm)	0.11	0.38	0.099	0.07	0.22
Particleboard	0.09	0.38	0.143	0.07	0.18

<u>Jurisdiction</u>	<u>Emission Regulation</u>	<u>Regulator</u>
CALIFORNIA	CARB-2	California Air Resources Board
CHINA	GB18580-2001 - to be superseded by GB18580-2017	General Administration for Quality Supervision, Inspection, and Quarantine
CHINA	GB18580-2017 - to become effective on 05-01-18	General Administration for Quality Supervision, Inspection, and Quarantine
EUROPEAN UNION	E1	European Communities Commission, Enterprise and Industry
EUROPEAN UNION	E0	European Communities Commission, Enterprise and Industry
JAPAN	F** (F-Star2)	Ministry of Health, Labor, and Welfare
JAPAN	F*** (F-Star3)	Ministry of Health, Labor, and Welfare
MEXICO	PROY-NOM-203-SCFI-2015	Ministry of Economics
USA	Toxic Substances Control Act, Title VI (USA) - to become effective on 06-01-18	U.S. Environmental Protection Agency

WHO guideline for Formaldehyde exposure = 0.1 mg/m<sup>3</sup> = 0.08 ppm



# Lacey Act of 1900, as Amended

- The Lacey Act makes it illegal to import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce wildlife specimens and domestic plants & plant products taken, traded, possessed, transported, or sold in violation of U.S. or foreign law
- 2008 Amendment added foreign plants & plant products
- To affirmatively establish compliance, U.S. companies should document origin and chain of custody of (particularly) foreign-sourced forest products
- Severe criminal and civil penalties for non-compliance:
  - Gibson Guitars: tropical hardwoods from Madagascar
  - Lumber Liquidators: flooring made in China that used timber from Myanmar and Russian Far East

# Oriented Strandboard

- OSB is the one panel product where North America still is the clear global leader. Europe and South America also are meaningful producers.
- The OSB industry in China is at an early stage; there are about 4 plants (all modern mills with continuous presses)
- International OSB trade was about \$2.5 billion in 2016
  - Majority of international trade is \$1.4 billion of Canadian OSB exported to the U.S.
  - OSB exports/imports to/from China are minimal

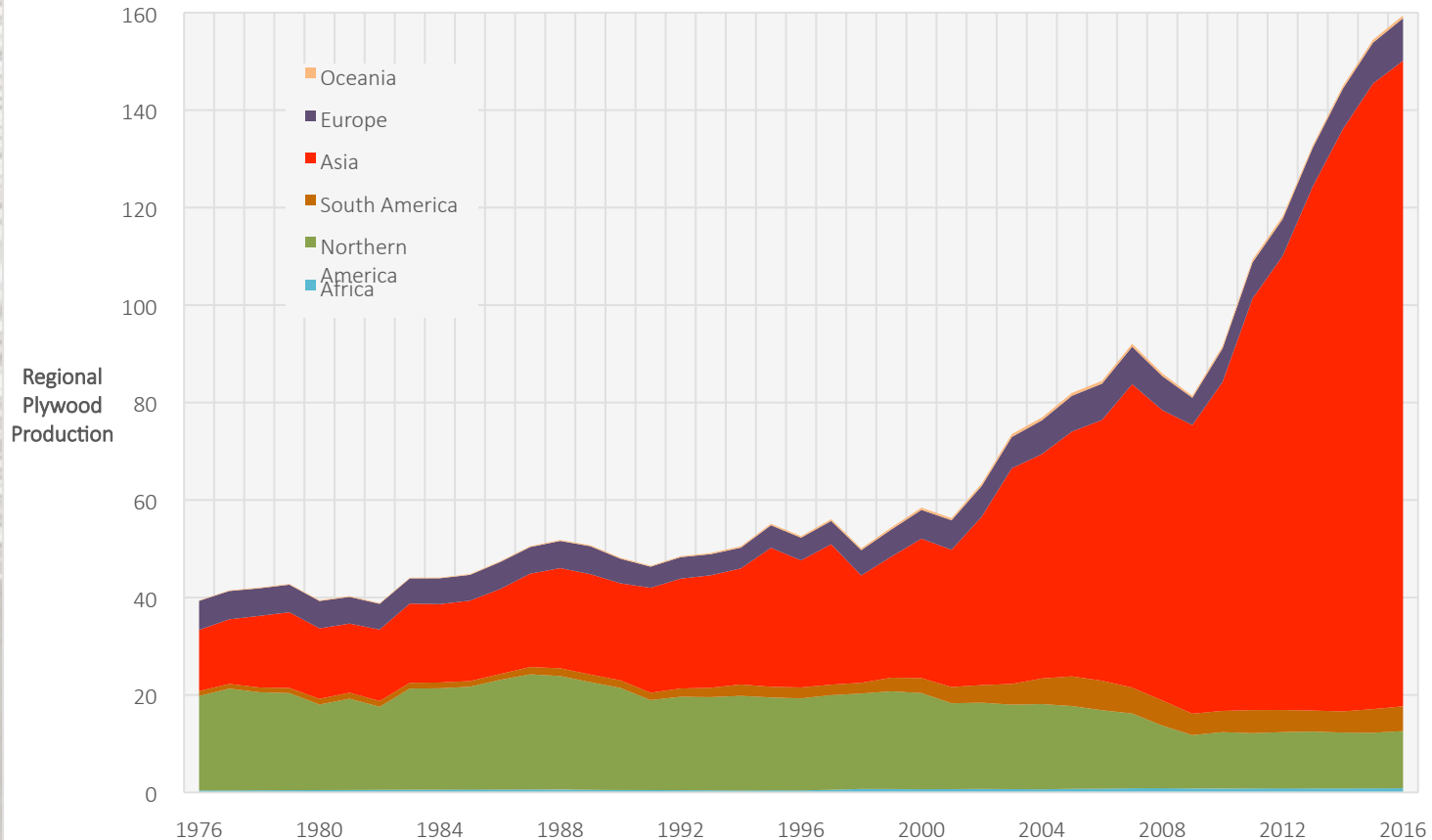


# Particleboard

- Europe still produces about half of all PB. However, China is a strong #2 and growing.
- Annual international trade in 2016 was \$4.9 billion, and has not grown for the past 5 years
- Imports and Exports of PB to/from China are small; virtually all Chinese PB is used for furniture production
- In 2017, U.S. imports and exports of PB were negligible; the trade deficit was \$5 million

# Global Plywood Volume is Increasing

Global plywood production, 1976 to 2016  
millions of cubic meters, 1 m3 = 1.13 MSM (3/8's basis board feet)  
*source: Food and Agricultural Organization of the U.N.*



China surpassed Europe in 1998 and the U.S. in 2003, and now is by far the leading producer



# Global trade in Plywood

- International plywood trade more than doubled to \$15.0 billion in 2016 from \$7.4 billion in 2003;
- However, international trade has been flat for past 5 years;
- In 2016, total plywood exports from China = 11.17 million m<sup>3</sup>, including 1.81 million m<sup>3</sup> to U.S.;
- In 2017, the U.S. plywood (hardwood + softwood + tropical) trade deficit was \$2,017 million (\$2,253 million in imports offset by \$236 million in exports).

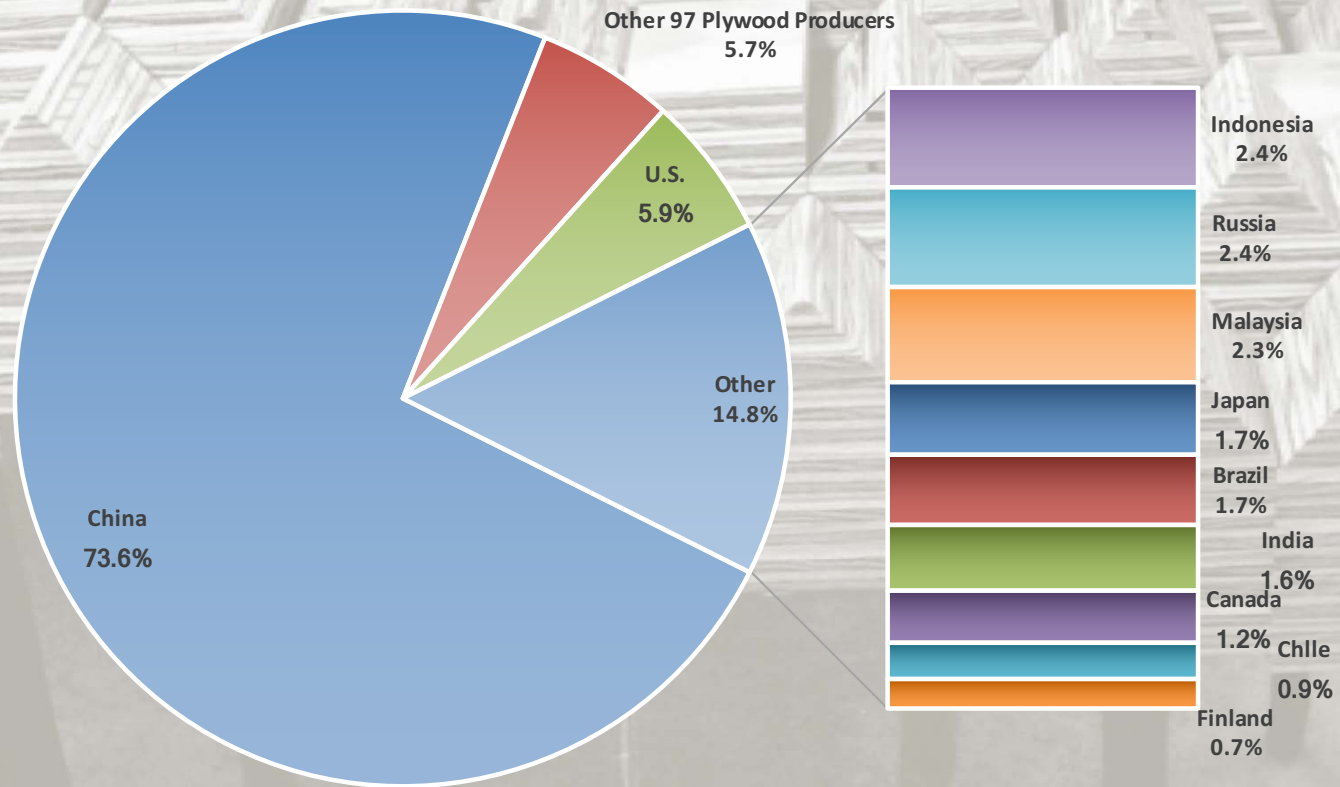
# China near 3/4s of global production

Global Plywood Production Share, 2016

Total Production = 159,400 million m<sup>3</sup>

Countries w/ production > 1,000 million m<sup>3</sup> are itemized.

source: FAO of UN



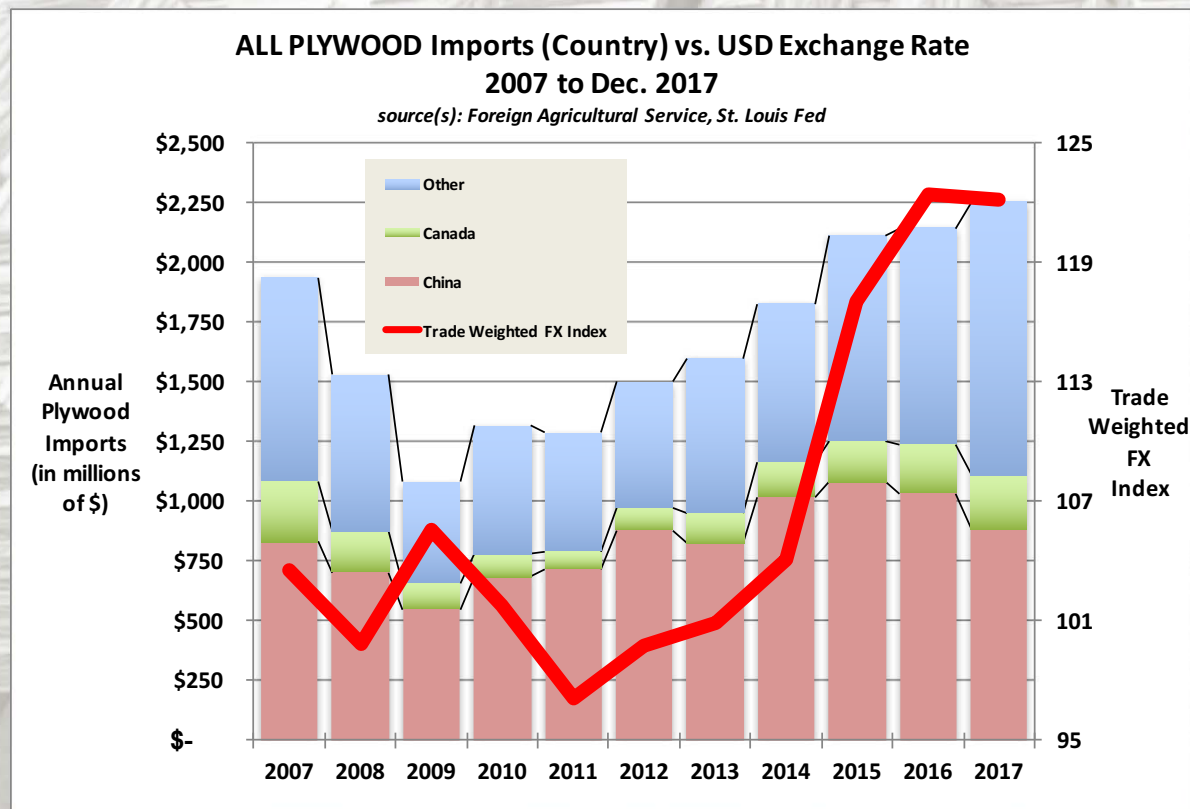
About 90% of Chinese plywood production is for domestic use & remanufacturing, but that still leaves a lot of plywood to export



# Potential Impact of AD/CV Duties

- Antidumping and Countervailing duties imposed on hardwood plywood (defined HS codes) imported from specific country (PRC)
- Dec. '17 \$ hardwood imports from PRC 45% less than Dec. '16
- Potential methods for PRC suppliers to minimize adverse impact of AD/CV duties:
  - Appeals to World Trade Organization
  - Modify panel so classified as softwood plywood
  - Send finished products (such as RTA Cabinetry)
  - Circumvention thru 3<sup>rd</sup> Country (ie. Cambodia, Vietnam)

# Plywood exports to U.S.



- § Plywood imports highly correlated with strength of the USD
- § 2017 Chinese hardwood plywood imports fell to \$760 million from \$1,001 million in 2016
- § 2017 Chinese softwood plywood imports grew to \$103 million from \$16 million in 2016

Trade-Weighted FX Index: Weighted average of the foreign exchange value of the U.S. dollar against the currencies of a broad group of major U.S. trading partners per the Federal Reserve Bank of St. Louis. Broad currency index includes the Euro, **Canada**, Japan, Mexico, **China**, United Kingdom, Taiwan, Korea, Singapore, Hong Kong, Malaysia, **Brazil**, Switzerland, Thailand, Philippines, Australia, Indonesia, India, Israel, Saudi Arabia, Russia, Sweden, Argentina, Venezuela, **Chile** and Colombia.



# Takeaways re Chinese wood panel Industry

- Approaching limit on wood panel production using domestic and imported logs; however, other sources of fiber may become available
- An increasing proportion of wood panels will be used domestically vs. exported
- Increasing proportion of wood products will be exported as higher-value products instead of raw panels
- Environmental concerns will become more important as China becomes wealthier
- Now is time for North American producers to prepare for development of Chinese OSB industry





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THANK YOU!

Questions or Comments?

*Scape* by John Frost

2009

Pine plywood and poplar wood