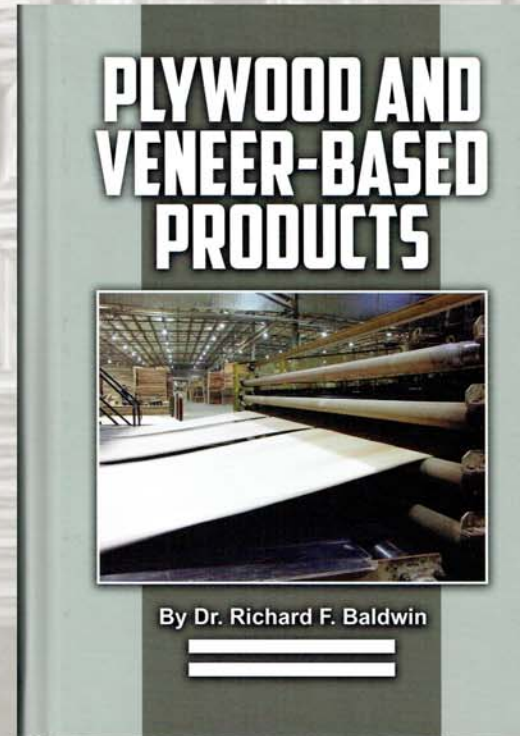


North American Plywood and Veneer-Based Industry: The Reinvention Continues

**Richard F. (“Dick”) Baldwin PhD, CF
April 7, 2016**

An Industry Participant and Observer for 60 years

- **Currently President of Winston Plywood & Veneer, a 400 million MSM (3/8" basis) mill in Louisville MS**
- **Previously senior executive positions at several independent and Fortune 100 producers**
- **Writer in spare time; latest book is Plywood and Veneer-Based Products**



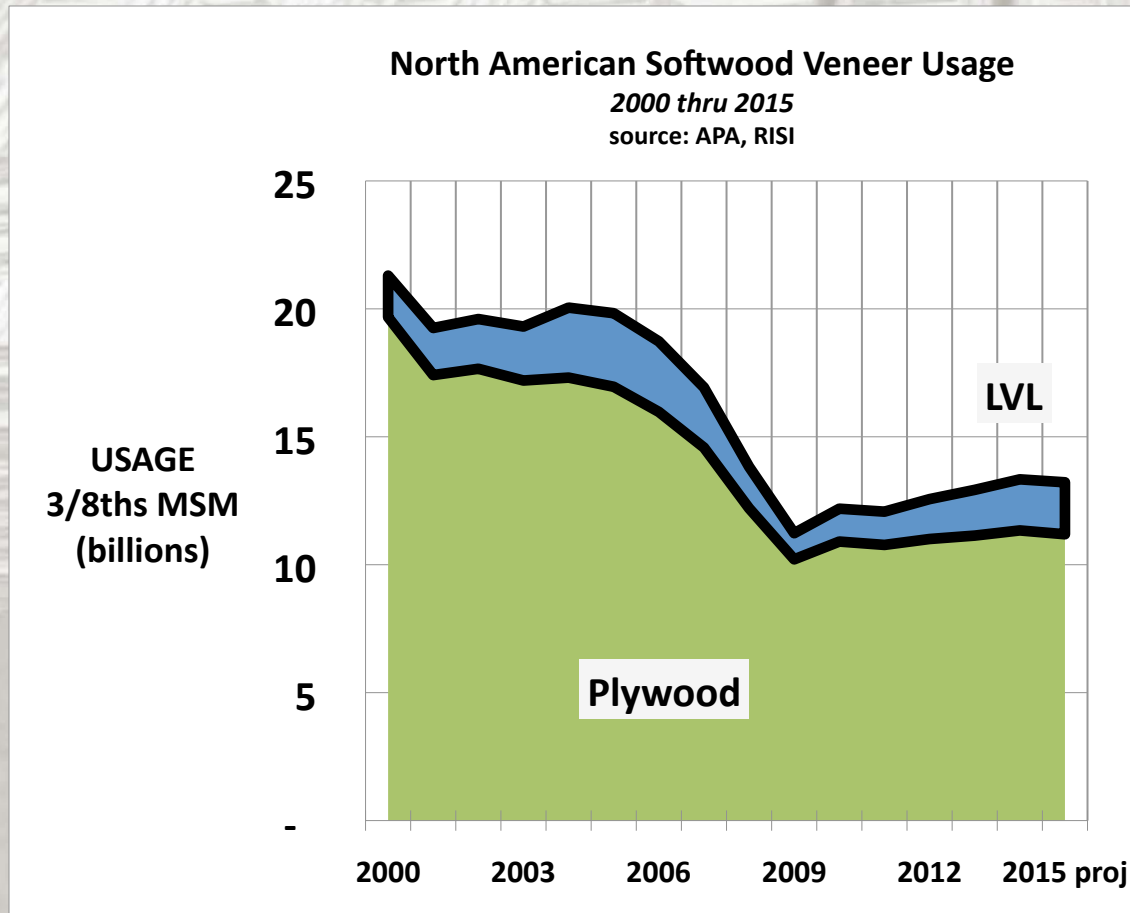
Baldwin, Richard F. Plywood and Veneer-Based Products. The Donnell Group, Montgomery AL. 2016.
Available on Amazon

An All too Familiar State of Affairs

OPERATING MILL COUNT	2006	2015
Plywood	86	60
LVL	23	17

- *The North American softwood plywood & veneer-based products industry declined while the Economy struggled through the Great Recession of 2007-2009*
- *The post Great Recession economic recovery has been anything but robust*
- *Veneer-based volumes are growing again, but only modestly*

Modest Recovery of Veneer-based demand

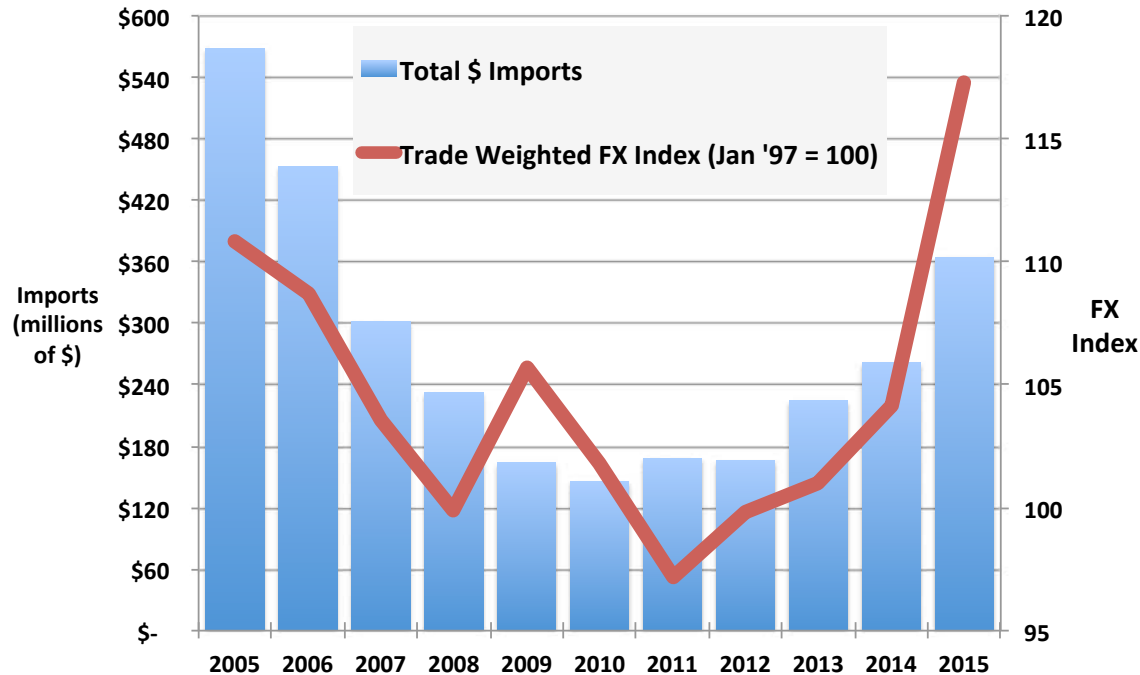


- *The total demand for plywood and veneer-based products is growing slowly as the economy continues to recover from the Great Recession*
- *A portion of demand is being met by foreign suppliers as net imports offset U.S. mill closures*
- *Domestic production increases have been modest*

Strong USD stimulates imports

Softwood Plywood Imports vs. Foreign Exchange Rate
2005 to 2015

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



- *Plywood imports correlated with the strength of the USD*
- *Most imports from Brazil, Canada, Chile, & China*
- *The Brazilian Real fell 49% and the Chilean Peso fell 17% against the USD in 2015*
- *\$365 mm of imports \approx 1.2 bb MSM ($\frac{3}{8}$ " basis)*

Trade-Weighted FX Index: A 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, as compiled by 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.

Net plywood imports will remain strong

“Many traders said the U.S. plywood market has been oversupplied by imports from Brazil and Chile (Random Lengths, October 2). Earlier this month, curtailments among U.S. producers of Southern Pine plywood brought supply and demand back into balance.” (Random Lengths Weekly Report, Oct. 30, 2015)

“Speaking of the dollar, we look for the greenback to appreciate modestly, but not to “soar,” versus most currencies in the quarters ahead.” (Wells Fargo 2016 Annual Economic Outlook, Dec. 9, 2015)

“A stronger dollar and weaker external growth have taken their toll on exports and will continue to do so in the near term. Meanwhile, real imports ... are likely to grow at a reasonably fast pace if US economic growth meets our expectations.” (FEA Macroeconomic Advisor, Feb. 2016)

Lackluster industry performance should provoke further soul-searching

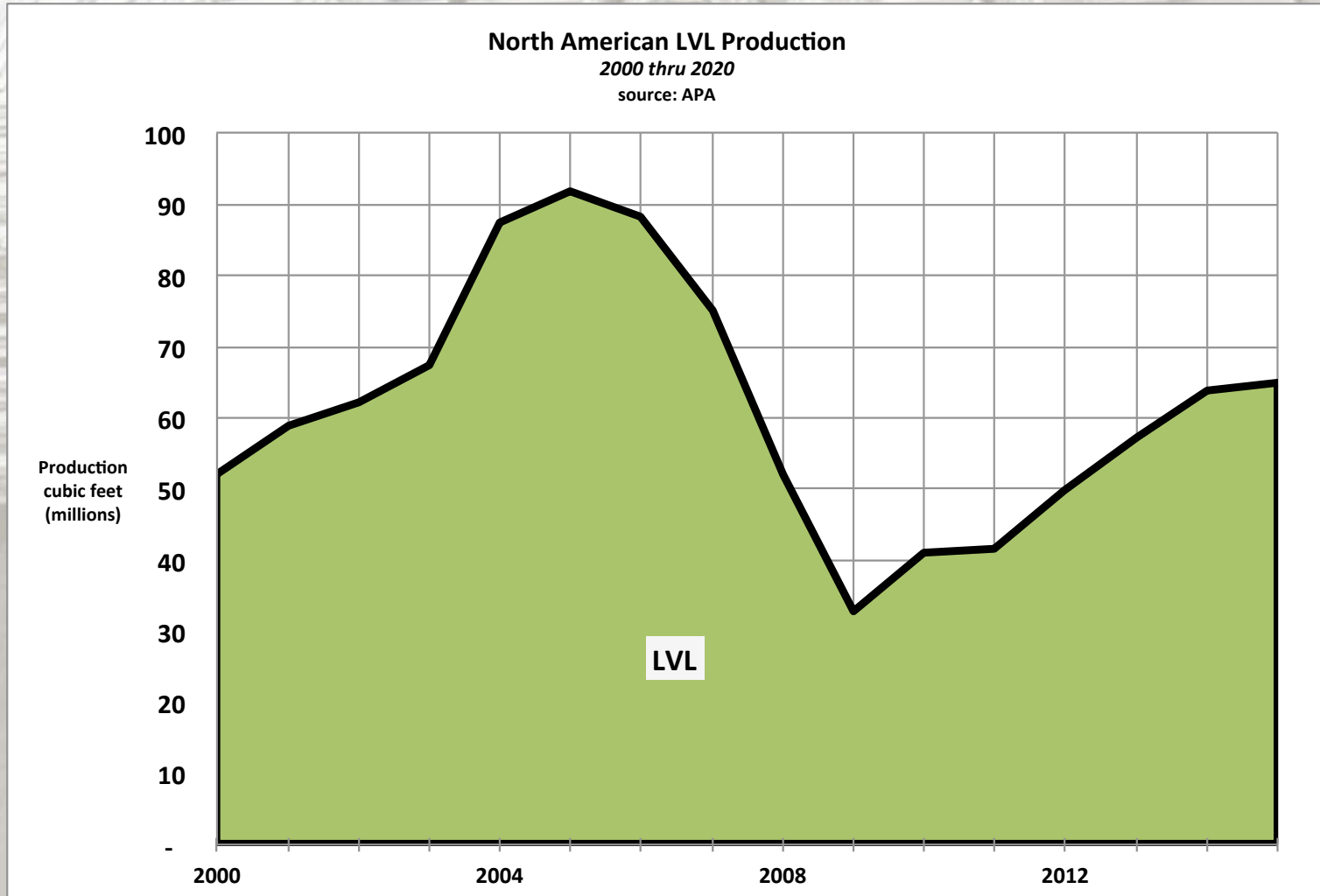
**Answers can provide important clues, and
answers are typically preceded by thoughtful
questions**

- **What changes have occurred? What are the implications for the present and for the longer term?**
- **How can this analysis provide a basis for decision-making in 2016 and later?**

Landmark Industry Events

- 1. INVENTION OF LVL (EARLY 1970'S)**
- 2. Invention of OSB (late 1970's)**
- 3. Timber as Stand-Alone Asset (early 1980's)**
- 4. More Efficient Wood Fiber Use (mid 1980's)**
- 5. Increased Environmental concerns (early 1990's)**
- 6. Rightsizing of Industry (around 2000)**
- 7. Plywood now a Global Industry**

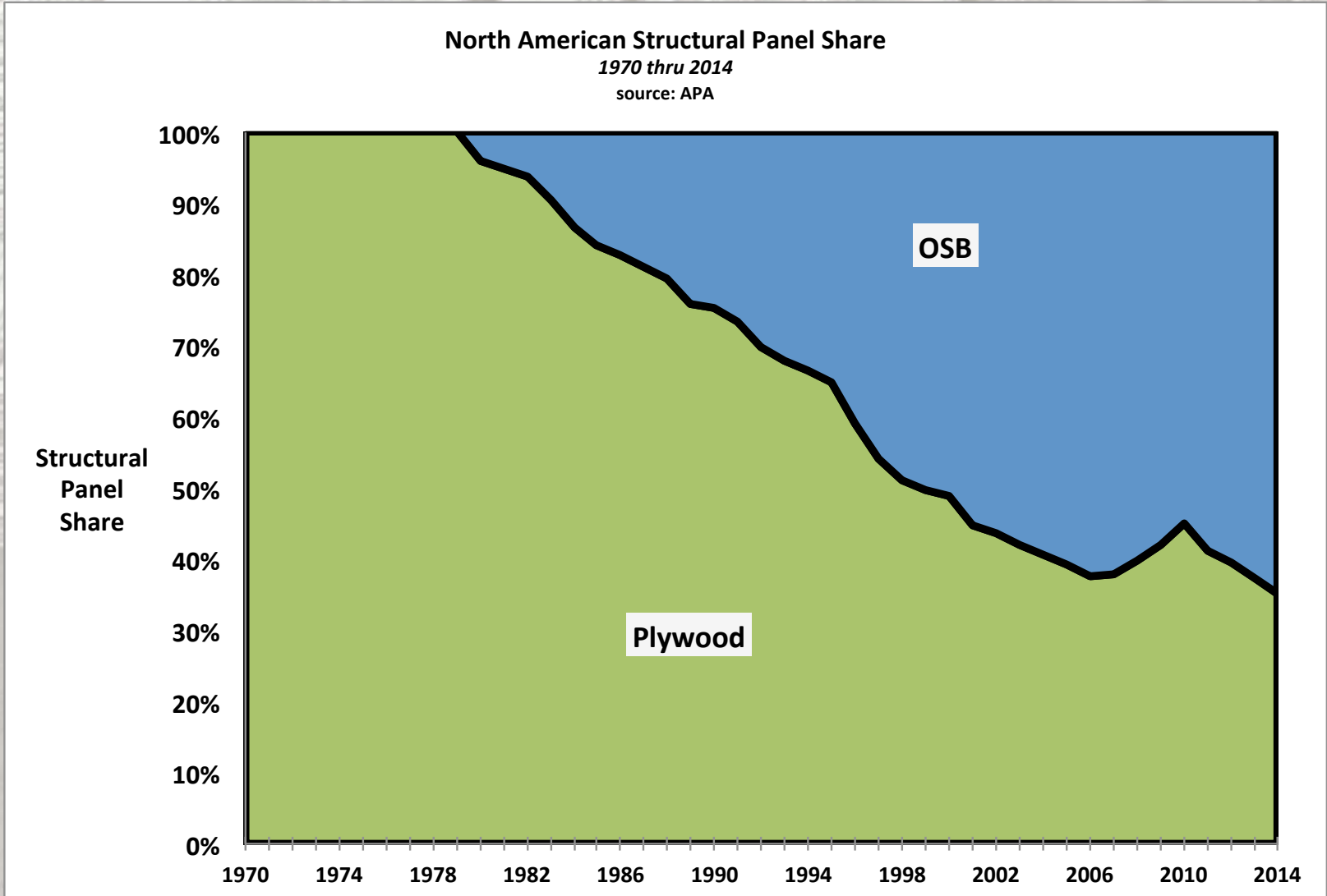
1. LVL demand tracks economy



Landmark Industry Events

1. Invention of LVL (early 1970's)
2. **INVENTION OF OSB (LATE 1970'S)**
3. Timber as Stand-Alone Asset (early 1980's)
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2. OSB substitution for Plywood



Landmark Industry Events

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3. Timber as Attractive Stand-Alone Asset

- **Timber became a desirable asset class by segregating timberlands from mills, and selling timberland to investors**
- **Wood products mills no longer could rely on cheap timber from sister divisions of vertically integrated forest products company**
- **Large forest products companies divested their plywood plants as underperforming assets**

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2. Invention of OSB (late 1970's)
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4. **MORE EFFICIENT WOOD FIBER USE (MID 1980'S)**
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4. Efficient use of Fiber from Small Logs

GREEN-END PRODUCTIVITY TIERS

TIER	Description	M 3/8s per Optg Hour
I	60s to 80s vintage lathe with original controls, charger, clipper, and trays.	20 to 30
II	60 to 80s vintage lathe with upgraded controls and original charger, clipper, and trays.	30 to 40
III	60 to 80s vintage lathe with upgraded controls, charger, clipper, and trays.	40 to 50
IV	State-of-the-art lathe with modern controls, charger, clipper, and trays.	50 and above

Based on peeling 1/8" veneer from properly heated blocks.

Landmark Industry Events

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2. Invention of OSB (late 1970's)
3. Timber as Stand-Alone Asset (early 1980's)
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5. **INCREASED ENVIRONMENTAL CONCERNS (EARLY 1990'S)**
6. Rightsizing of Industry (around 2000)
7. Plywood now a Global Industry

5. Societal Focus on Environment

- Preservation of the environment has entered human consciousness in a big way**
- Plywood now comes from a renewable resource—with a wide variety of species coming from diverse growing sites**
- Virtually the entire delivered timber stem is transformed into veneer or a useful byproduct**

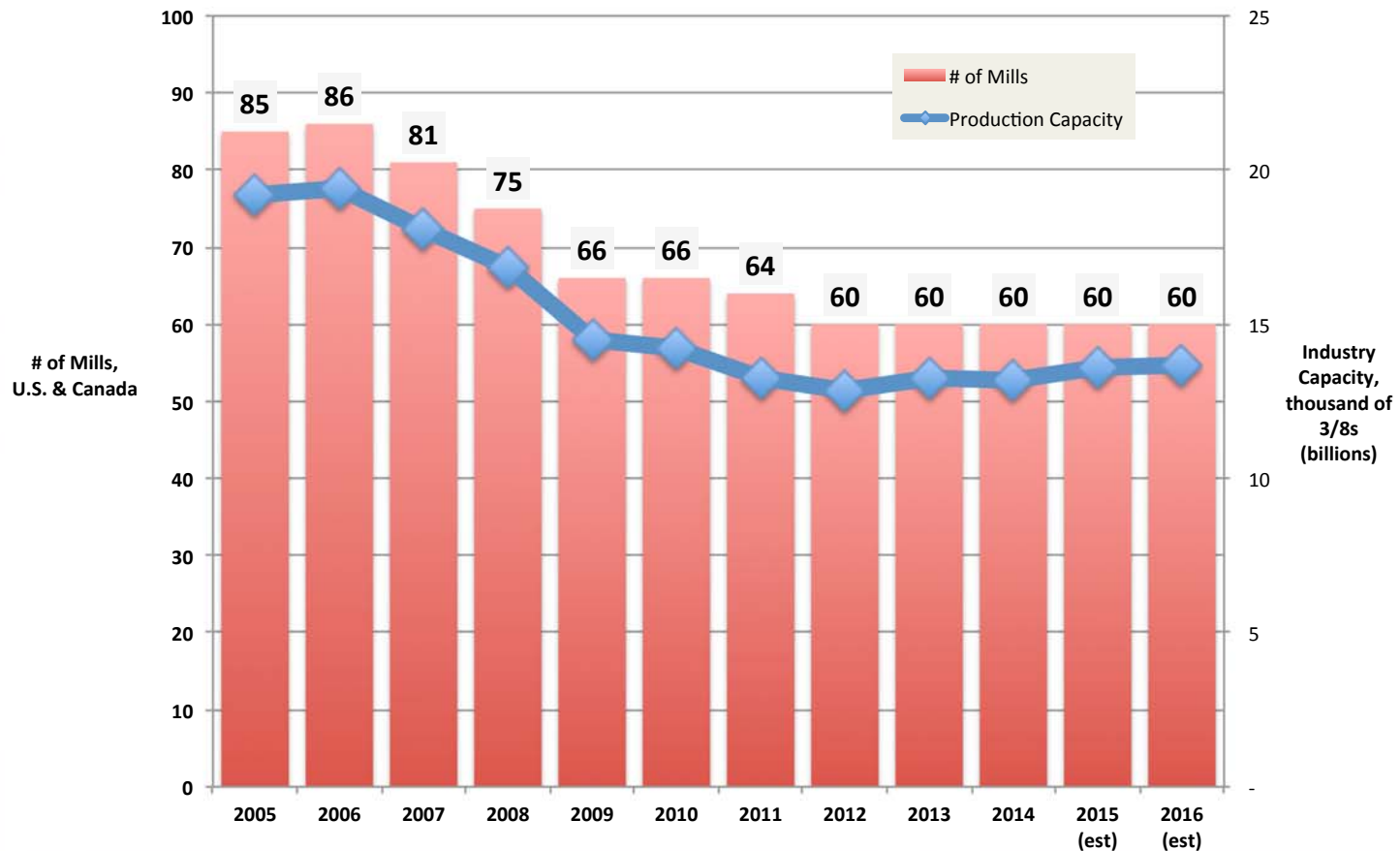
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6. **RIGHTSIZING OF INDUSTRY (AROUND 2000)**
7. Plywood now a Global Industry

6. Rightsizing of industry to match supply with demand

N.A. Softwood Plywood Industry Capacity and Mill Count

source: RISI



Landmark Industry Events

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6. Rightsizing of Industry (around 2000)
7. PLYWOOD NOW A GLOBAL INDUSTRY

7. Plywood now a global product

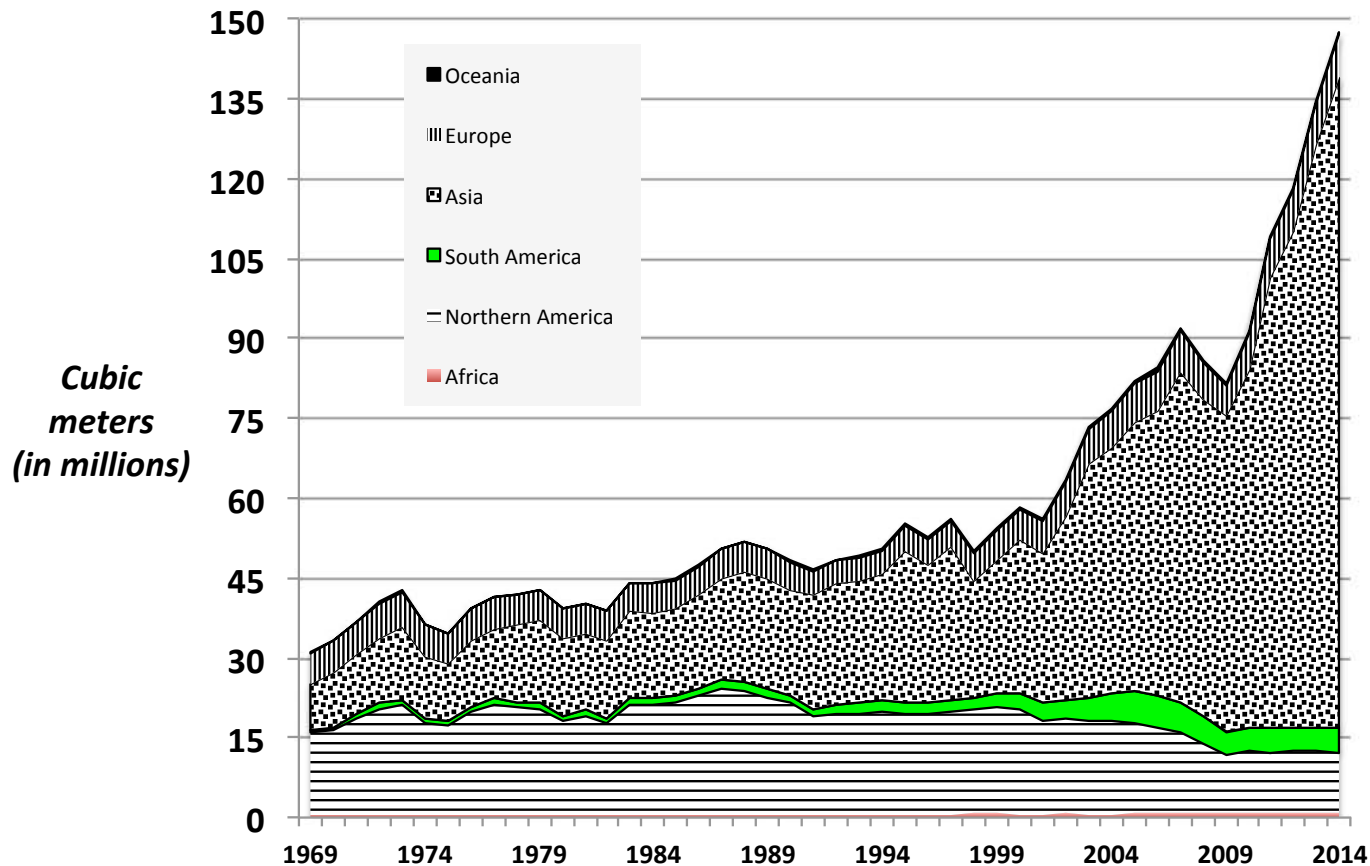
- Up until about 2003, North America was the most important producing region... Now China is by far the leading producer**
- At least 100 countries produce plywood, with 9 countries accounting for 90% of global production**
- International plywood trade more than doubled to \$15.9 billion in 2014 from \$7.4 billion in 2003**

7. Global Plywood Production Continues to Grow

Global plywood production, 1969 to 2014

millions of cubic meters; 1 m³ = 1.13 SF (3/8" basis)

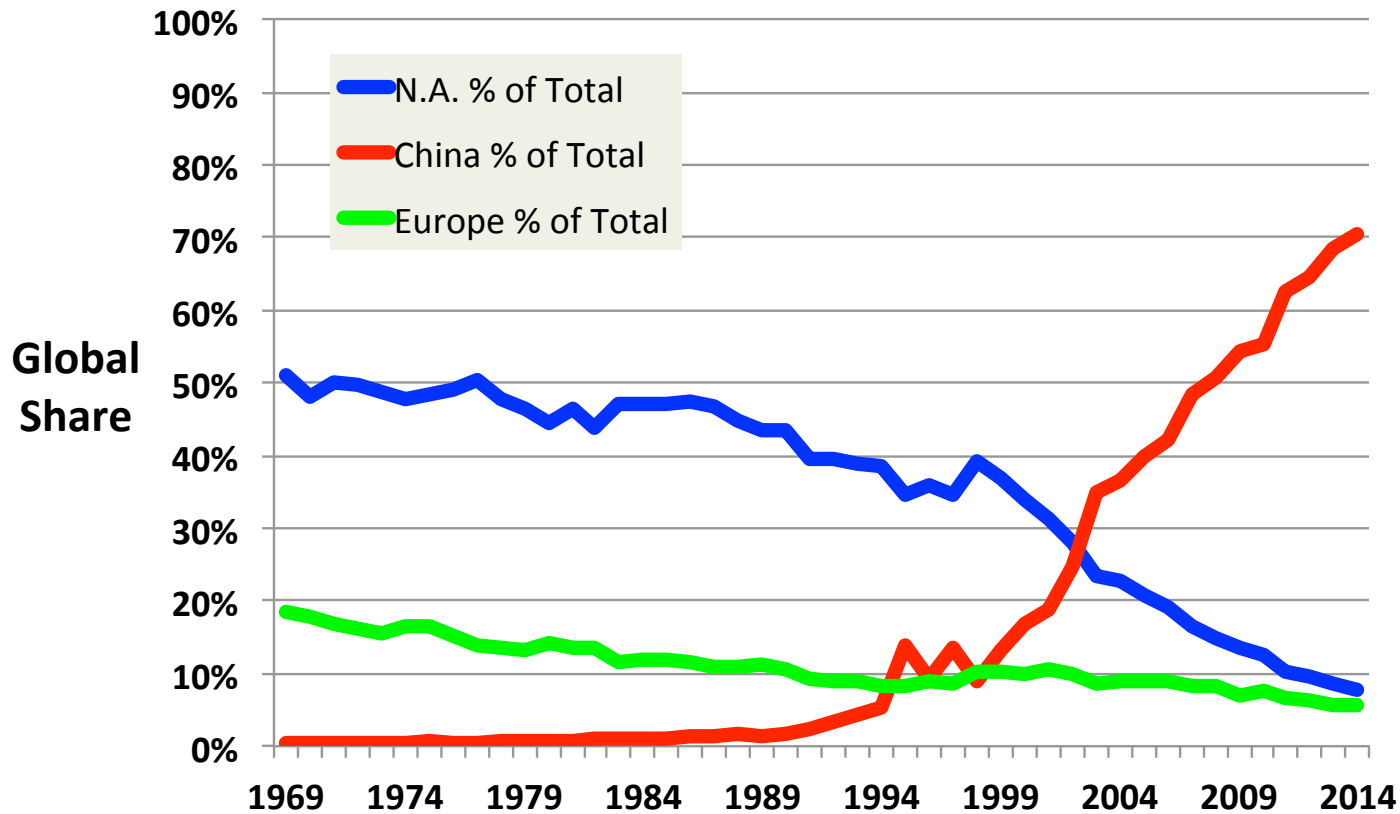
source: FAO



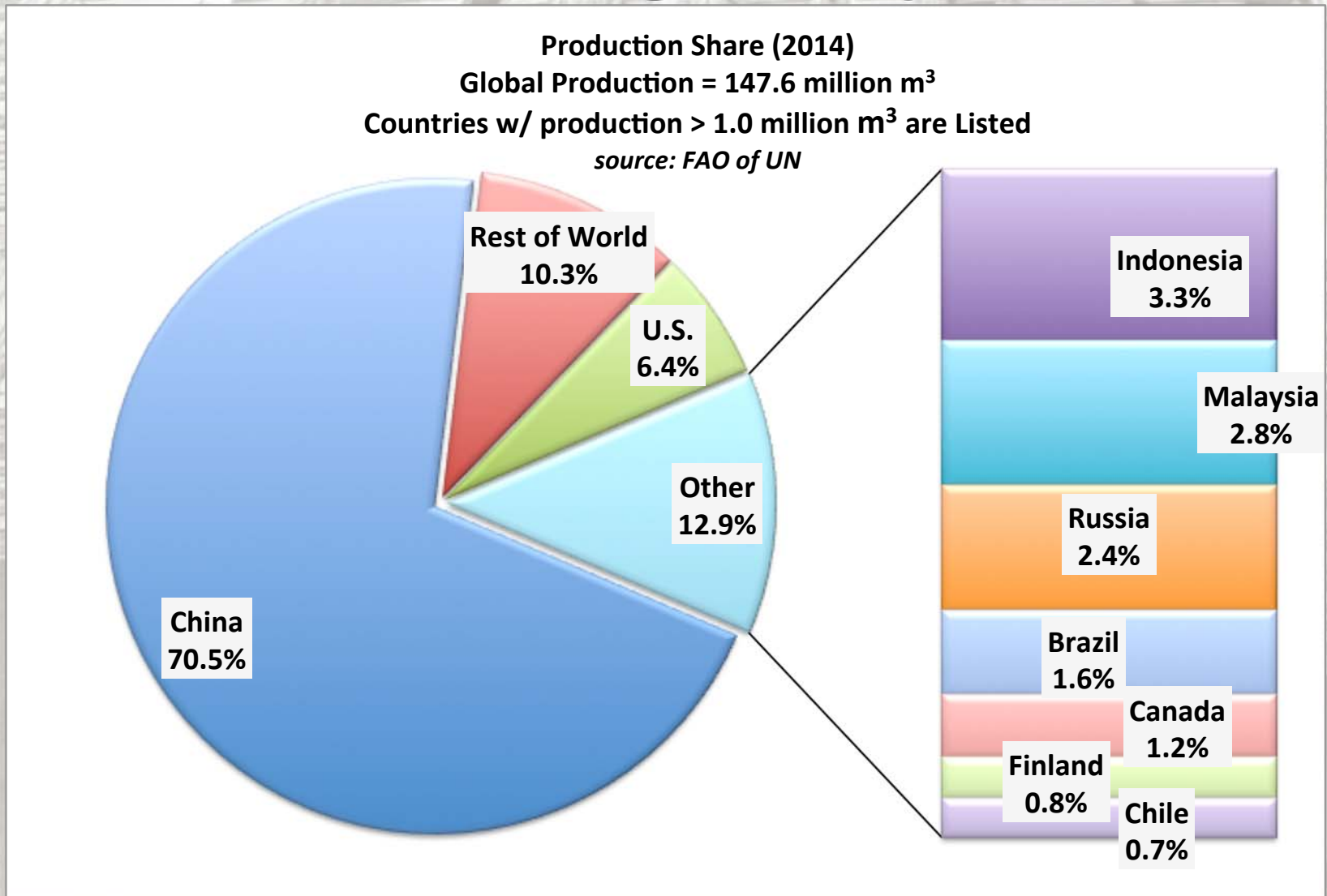
7. Rise of China, fall of developed regions

Rise of Chinese global plywood share, 1969 to 2014

source: FAO



7. China 2/3's of global production



Working within the constraints, we can put into practice steps that sustain a healthy plywood and veneer-based Industry into the future.

- 1. Green End**
- 2. Dry End**
- 3. Marketing**
- 4. Leadership**

Historic plywood industry legacy and cultural norms will materially aid the process.

Action Step #1: Green End

Crucial elements in improving lathe line performance:

- 1. Installation of advanced electronic innovations**
- 2. Reengineer equipment and production processes for greater systems functionality**
- 3. Redesign the people processes to emphasize involvement and engagement**

Getting the “just right” combination of these is the key to success.

Action Step #2: Dry End

One 'latest generation' veneer dryer can equal the production capacity of three older veneer dryers

DRY-END PRODUCTIVITY TIERS

TIER	Description	M 3/8s per Optg Hour
I	60s to 80s vintage jet dryers with 4+ decks.	less than 12
II	Updated Tier 1 Dryers with stacker.	16 to 18
III	State-of-the-art 6-deck dryer with high-speed stacker.	33 to 41

Based on Drying full 1/8" sheets (54's) with comparative veneer species and moisture content sorting using a dryer with main line steam feed pressure of 290 to 310 PSI.

Action Step #3: Marketing

- Plywood's relative prosperity during the 1st half of the 20th Century was based on meeting requirements for specific end uses
- Fast forward 50+ years and plywood is perceived as nothing more than a CDX panel equivalent to OSB sheathing
- Today's marketing challenge is to overcome the incorrect perceptions that now define plywood for many potential users

Action Step #4: Leadership

- **Understanding the relationship between the manufacturing process and market development will facilitate innovative solutions by decision makers**
- **Entrepreneurial leadership that focuses on involvement and engagement of the team, in contrast to authoritarian command and control**
- **Optimum answers will come from adapting innovative ‘thinking and doing’ best practices appropriate for each mill’s unique circumstance**

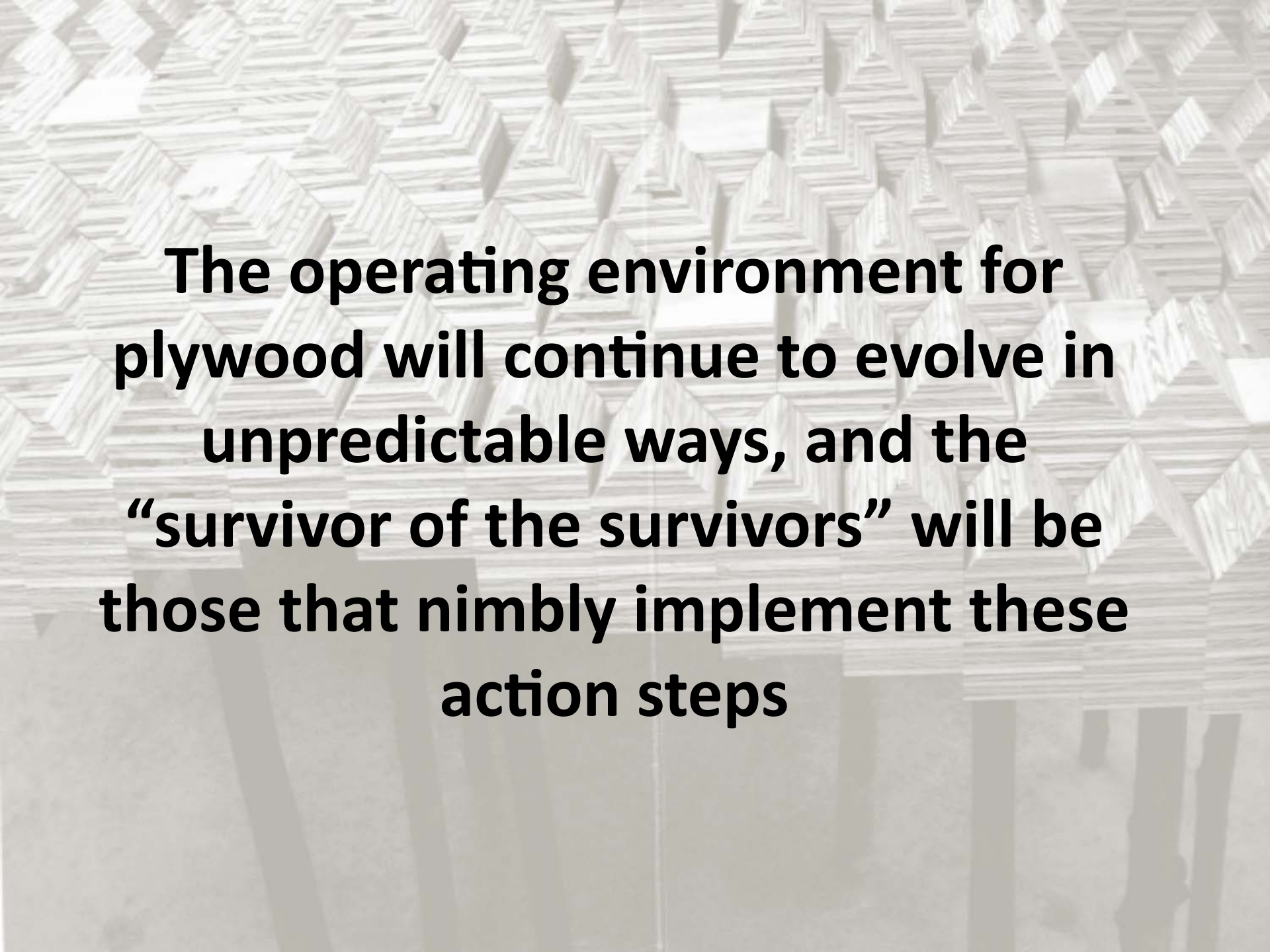
Industry legacy

“Developments that have since raised plywood manufacture to a major Northwest industry have come chiefly from the utilization of scientific research and laboratory methods to extend the uses of plywood in industry and the home, and the application of an aggressive sales policy.” (Seattle Post-Intelligencer, Aug. 4, 1937)

“Plywood as an industry has no limits, no optimum of achievement... The plywood thinker ... conjures of a better product, bigger production and more and more new developments of the panel industry... Plywood research goes on. The industry improves with each panel produced.” (Robert M Cour. The Plywood Age, Douglas Fir Plywood Association, 1955.)

Remember Plywood has 1000 uses!

- Alternate grain direction provides unique product attributes of STABILITY, STRENGTH, DURABILITY, and BEAUTY
- Markets evolve, but customer fundamentals do not... Users still want a cost effective solution to their problem
- Must increase manufacturing process efficiency through innovative technologies and adapting to the raw material supply



The operating environment for plywood will continue to evolve in unpredictable ways, and the “survivor of the survivors” will be those that nimbly implement these action steps



THANK YOU!

Questions or Comments?

Scape by John Frost

2009

Pine plywood and poplar wood