American Hardwood Promotion: Growing the Global Pie

Michael Snow
Executive Director
American Hardwood Export Council
March 2017

www.americanhardwood.org
GROWING THE FUTURE FOR AMERICAN HARDWOODS

NEW MARKETS FOR UNDERUSED SPECIES

NEW APPLICATIONS

INDUSTRY NETWORKING

CAPITALIZE ON GREEN CREDENTIALS
TRADE SHOWS
American Hardwood Pavilions in Istanbul, Bangalore & Dubai
American Hardwood Pavilion at the Dubai Wood Show
The AHEC 21st Southeast Asia & Greater China Convention  
(June 24-26, Chongqing PRC)

AHEC 18th convention gathered 750 delegates from 13 countries. 
Over 30 AHEC members attended the networking luncheon to meet with regional buyers and received market updates from 7 association executives. Over 40 media attended the convention press conference that yield over 100 clippings.
Mini-Trade Show: Face to Face Meeting Opportunity at Convention
EDUCATION

Technical Seminars & Workshops for Architects, Designers, Manufacturers & Importers
AHEC’s key strategies resonate with the trade, as they played back increased interest in “environmental/Life Cycle Assessment information” and “sustainable/U.S. forest statistics/information” – two key messages communicated at events throughout the year. In addition, and not surprising, the professionals are still interested in “information on the various species and their uses”.

Q37. What type of information/materials could The American Hardwood Export Council provide to you that would encourage you to use/specify U.S. hardwood more often?
Another key constraint being addressed by the industry, is the relatively modest knowledge of the NHLA grading rules.

Q8. How would you characterize your overall knowledge of the NHLA grading rules for U.S. hardwood lumber?
Again, this perceived “lack of knowledge of characteristics and grading” is an issue in all markets, with at least 4 in 10 of the professionals feeling this way.

### Does Lack of Knowledge of Characteristics/Grading Impede Increased Use of U.S. Hardwoods – Top-2 Box

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Agreement 1</th>
<th>Agreement 2</th>
<th>Agreement 3</th>
<th>Agreement 4</th>
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<tbody>
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<tr>
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<tr>
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<tr>
<td>India</td>
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<tr>
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<tr>
<td>Japan</td>
<td>47%</td>
<td>57%</td>
<td>61%</td>
<td>57%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Q10. Using a 5 point scale, where a 5 means you “agree completely” and a 1 means you “disagree completely”, how much do you agree or disagree with the following statement – “my lack of knowledge of characteristics/grading impedes increased use of U.S. hardwoods”?
NHLA Grading Seminars in Southeast Asia
Sponsored by AHEC
Increasing the trade’s knowledge of grading rules is a global opportunity.

Overall Knowledge of NHLA Grading Rules for U.S. Hardwood Lumber –
Top-3 Box (Excellent/Very Good/Good)

Q8. How would you characterize your overall knowledge of the NHLA grading rules for U.S. hardwood lumber?
The Centre is literally the centerpiece of the capital city of Azerbaijan, and the design was specifically chosen to break from the rigid Soviet architecture found throughout the city.
Heydar Aliyev International Airport in Azerbaijan by Autoban Studio in American white oak
THE FUTURE FOR AMERICAN HARDWOOD EXPORTS

- NEW MARKETS FOR UNDERUSED SPECIES
- NEW APPLICATIONS
- CAPITALIZE ON GREEN CREDENTIALS
Promoting underutilised species
THE WORKSHOP OF DREAMS

The Workshop of Dreams is a creative journey that brings together four of Spain’s most exciting architects and designers, with inspiring talents from diverse cultural fields, in a celebration of Spanish creativity and craftsmanship with wood.
The brief: No white oak or walnut!
Showing 8 underutilised species
Meeting the inspirers and discovering their dream object
Making Cercas Territory, an ergonomic chair
Combining natural forms and advanced technology
A portable cabin in American tulipwood
Talk events with architects
Microsite
Coverage

ABC

Madrid TV

Arch Daily

El Pais

Diario Design
Social Media – Example: Facebook live
CERCA DE LA SILLA DE PRITZKER

La Fundación Miralles presentó este martes desde el Palacio de Congressos el segundo concurso de la Fundación Pritzker, que otorga el máximo reconocimiento a arquitectos en todo el mundo.

El premio es otorgado por el consejo ejecutivo de la Fundación, dirigido por el fundador, el arquitecto y empresario Canadian José Luis Aragonés, y el presidente, el empresario James Dyson.

La Fundación Pritzker exige que los arquitectos propusieran un proyecto que se entregara en dos etapas: una en 2017 y otra en 2018. El proyecto final deberá ser entregado antes de la muerte del arquitecto.

Los arquitectos propusieron proyectos que se caracterizan por su innovación, sostenibilidad, armonía con el entorno yabilidad social.

La Fundación Pritzker ha otorgado hasta la fecha 93 premios a arquitectos de todo el mundo. El primer premio fue otorgado en 1978 a I.M. Pei.

La Fundación Pritzker inauguró su sede en Barcelona en 2015 con el objetivo de acercar el Premio Pritzker a los arquitectos y al público en general.

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ALONG THE LINES OF [ happiness ]

Laura Ellen Bacon and Sebastian Cox open the borders of the invisible store of happiness and celebrate the unique qualities of American cherry, soft maple and red oak.

#ALONGTHELINES
Promoting red oak, maple and cherry
Staging a live performance of craftsmanship
A whole new level of PR in Italy

Il Sole 24 ORE
Italy’s Financial Times

TV
National and international

David Venables
Positive impact of creative projects on website traffic

Milan – Along the Lines of Happiness

London – The Smile
Finding New Market Segments
Even in “Mature” Markets:

1) Exterior Uses for American Hardwoods
2) Structural Uses

Research and Testing for New Applications and Technologies
External joinery
Infinity Bench
Designed by Martino Gamper

Heat treated American red oak, ash, soft maple, yellow birch & tulipwood
Heat treatment

Class 1 durability
Improves stability
Changes appearance
Better U values

tulipwood
red oak
soft maple
yellow birch
ash
A timber longhouse, designed by Asif Khan, using thermally modified American tulipwood and ash to transform play time at Chisenhale primary school.
PLAY TIME
Museum of European and Mediterranean Civilisations in Marseille
The time is now: timber in construction
Another significant strategic opportunity for AHEC moving forward revolves around structural application. Awareness of news stories/information about the structural applications of U.S. hardwood also has significant room for growth (in all countries/regions).

### Awareness of News or Stories About Structural Applications for U.S. Hardwood

Q30b.  Are you aware of any news or stories recently about the structural applications for U.S. hardwood products?

<table>
<thead>
<tr>
<th>Region</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>Middle East</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>LA/Caribbean</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Oceania</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>China/SE Asia</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

**Graph:**
- **Yes:** Europe = 18, Middle East = 7, LA/Caribbean = 14, Oceania = 20, India = 10, China/SE Asia = 18, Japan = 19
- **No:** Europe = 12, Middle East = 10, LA/Caribbean = 17, Oceania = 88, India = 90, China/SE Asia = 83, Japan = 20
Traditionally, the use of American hardwood species has been largely limited to non load-bearing applications. But now a shift in fason towards wood solutions is fueling a desire amongst specifiers to combine structural performance with aesthetic design. In 2001 AHEC teamed up with Arup and commissioned the Building Research Establishment (BRE) in the UK to undertake testing of four American hardwood species – ash, white oak, red oak and tulipwood. The results established that these species comply with Eurocode 5 and have the potential to be used structurally.

Affect of Structural Information on Likelihood to Use/Specify U.S. Hardwood

Q31. After reading this information, would you be...?
Towers Built Out of Wood, Not Steel

By HENRY FOUNTAIN

The movement to construct tall buildings largely with wood as an environmentally friendlier alternative to steel and concrete has received a boost from an unusual source—a leading architectural firm known for its towers of steel and concrete.

Skidmore, Owings & Merrill, the Chicago-based firm that has designed a long list of skyscrapers, including the new One World Trade Center in Lower Manhattan, has developed a structural system that uses so-called mass timber—columns and thick slabs that are laminated from smaller pieces of wood. In a report this year, the firm showed how the system could be used to build a 42-story residential tower that would have a lower carbon footprint than a conventional structure.

“We wanted to see what we can do to help on the sustainability side,” said William F. Baker, a partner in the firm. With its system, about 70 percent of the structural material is wood; most of the rest, including the foundation, is concrete.

Benton Johnson, an engineer who wooden towers that was detailed in a report last year, said: “This is the first new way to build in a hundred years.”

Comparing Timber and Conventional Structures

PROPOSED, timber structure

BENCHMARK, concrete structure

VOLUME OF MATERIALS

BUILDING WEIGHT

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Cubic meters</td>
<td></td>
</tr>
<tr>
<td>Wood</td>
<td>13.610</td>
<td></td>
</tr>
<tr>
<td>Steel</td>
<td>13.640</td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td>13.640</td>
<td></td>
</tr>
</tbody>
</table>

This is not conventional frame construction, in which thin elements are nailed together, but mass timber to build...
Murray Grove, London

- Waugh Thistleton Architects
- 9 storey timber building
- Cross laminated lumber
- Completed 2008
- 4 carpenters assembled structure on-site at a rate of 1 storey a week
- Building weighs 300 tonnes
- ¼ weight of equivalent concrete building
- Saves 306 tonnes of carbon to a comparable steel and concrete tower, with 183 tonnes locked into the timber.
“THE EIFFEL TOWER EFFECT”

- 34 story residential building in Stockholm
- World’s Tallest Wooden Skyscraper
- To be completed in 2023
• AHEC-funded research has proven hardwood CLT’s viability

• Can replace concrete

• Current weakness is the glue

TPryor@ahec.org
First ever production of hardwood cross-laminated timber (CLT)
Endless Stair by dRMM Architects in American tulipwood

14.5 tonnes of CO$_2$ was stored in the structure – which is actually greater than the 13.1 tonnes of carbon emissions required to manufacture, deliver and assemble the whole structure.
The largest CLT panels ever made

- 10m long
- 14m long
- 10m long
- 34m long
- 3m high
Our brief to the architect
“We’ve used a brand new product to create The Smile. It is the first use of hardwood as a cross-laminated structural panel that will transform the way architects and engineers approach timber construction.”

*Alison Brooks, Alison Brooks Architects*
Private view with the Ambassador
Global design forum masterclass
Project microsite

2,100 visitors from August – September. Increasing from 45 hits per day to 225 during the London Design Festival
Exhibition print coverage

Evening Standard

“Architect Alison Brooks, who made the structure with engineering group Arup and the American Hardwood Export Council which provided the wood said it looked like, ‘Our archetypal image of Noah’s Ark’.”

Circulation: 858K

The Times & The Irish Times

“The Smile certainly showcases the structural and spatial potential of cross-laminated hardwood, rapidly becoming the go-to material for all sorts of projects, from quick to-build housing to futuristic skyscrapers…”

Circulation: 511K
Online coverage

Inhabitat
“Curved timber “Smile” building in London is “stronger than concrete”
12.6M visits pm
Audience: Building/Construction

CNN
“Stronger than concrete? Why this new material could define our age.”
12.6M visits pm

Dezeen
“Alison Brooks creates giant smile using cross-laminated tulipwood.”
733K visits pm
Audience: Design, Architecture

Financial Times
“The Smile’, one of the festival’s landmark projects is designed to be an immersive pavilion.”
4M visits pm

Financial Times
4M visits pm

The Times
1.5M visits pm
Social media

- Design Milk
  - 1.47M followers

- National Building Museum
  - 220K followers

- Wallpaper
  - 1.5M followers

- LDF
  - 146K followers
TV & radio

CNC News
50M viewers

BBC World Service
200M listeners
AMPLIFIED MESSAGING

Print 5.3M
Online 290M
Maggie’s Center – Oldham, UK

First commercial use of tulipwood CLT
Maggie’s care centre Oldham UK – dRMM Architects
WORK STACK
Cantilevered dRMM design using tulipwood CLT – early stages of planning
Global production of CLT, 1990-2015

Note: f = forecast.

Source: Institute of Timber Engineering and Wood Technology, Graz
Driving demand for hardwood CLT

www.hardwood-clt.com / org / info
www.hardwoodclt.org / info
Structural Design in American Hardwoods

- 5 US Species Accepted into EU Building Codes following AHEC-Funded Strength Testing
Portcullis House, London

White oak glulam
LORD’S CRICKET GROUND

New Warner stand featuring world’s longest American white oak glulam beams – launching May
Proposed new Warner stand at Lords cricket ground
Top Three Challenges for American Hardwoods:

1) Find New Markets for Graded Lumber

2) Find New Applications

1) Capitalize on Green Credentials
Demonstrating American hardwood environmental profile
Seneca Creek Study
2016 Review Process

• Taking account of:
  – most recent U.S. forest inventory data
  – changes in U.S. forest policy, regulation, & management
  – developments in international policy, regulation and codes for assessing and verifying legal harvesting and SFM practices
    • e.g. EUTR, FSC Controlled Wood, PEFC CoC standard, public procurement policies, private sector procurement codes

• Subject to review by expert panel

• PLEASE TAKE A MOMENT TO FILL OUT THE QUESTIONNAIRE WHEN YOU RECEIVE IT!!!
US hardwoods: an expanding resource

Source: USDA Forest Inventory & Analysis (FIA)
http://apps.fs.fed.us/fia/fido/index.html
AMERICAN HARDWOOD EXPORT COUNCIL

distribution / growth / removals
AHEC NEW WEBSITE distribution maps

US MAP
distribution on all species
Renewability of American hardwoods

This interactive tool uses published US Forest Service data to show national and regional, distribution, growth and removal information for most of the main commercial American hardwood species.

Please note: this is a beta version intended for testing purposes only. We make no guarantees as to the accuracy of this representation.

Select data map: Forest volume
Select species: All species
Select state (list or click on map): Indiana

GROWTH AND REMOVALS, 1000 m³
-10K
-9K
-8K
-7K
-6K
-5K
-4K
-3K
-2K
-1K
0
1K
2K
3K
4K
5K
6K
7K
8K
9K
10K

Growth 6.181
Removals 2.694
Net growth 3.487

FOREST VOLUME, 1000 m³
200K
160K
120K
80K
40K
10K
0

Volume of live trees on forest land, 1000 m³
All data derives from Forest Inventory Data Online (FIDO), a component of the U.S. Forest Service Inventory and Analysis Program (FIA). Data was compiled by AHEC in January 2016 using the most recent state inventory available (2014 for most states).

“Forest volume” refers to “total volume of live trees on forest land” as defined by FIA (see glossary). FIA forest volume data is available for 49 U.S. states (Hawaii and Washington D.C. are omitted) with total hardwood forest volume of 101 billion m³ of which 13.5 billion m³ are commercially significant.
AHEC NEW WEBSITE
distribution maps

US MAP

growth
red oak
michigan
It took just **25 seconds** to grow the American white oak in this 500m2 deck.
Grown in Seconds Campaign

It took just 40 seconds to grow the American cherry used in this project.
Species: WHITE OAK
Volume: 13.73 m³

Carbon Stored: 
- CO₂: 14519 m³

Carbon Footprint: 
- CO₂: 5,661.1 m³

Replenishment: Growninseconds.org
LCA Report for AHEC Project
AHEC LCA: materials sheet

<table>
<thead>
<tr>
<th>Life Cycle Assessment materials sheet</th>
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</thead>
<tbody>
<tr>
<td>Name of the project</td>
</tr>
<tr>
<td>Functional Unit</td>
</tr>
</tbody>
</table>

| Total weight of functional unit (kg) | 206.50 |
| Total weight of timber input (kg)    | 698.20 |
| Total weight of other components input (kg) | 5.25 |
| Calculated weight of wood waste (kg) | 496.95 |

Utilisation of wood waste (give as much detail as possible)

7% of the waste has been stored in the warehouse and will be used for other projects, 1% is in our warehouse but is not usable as it's in the shape of small wood chips and 92% of the waste comes from milling and carving the piece of furniture. Non-reusable waste is removed by a qualified company, and ground to make waste derived fuel (energy recovery).

<table>
<thead>
<tr>
<th>Timber components</th>
<th>Unit Dimensions (cm)</th>
<th>Unit</th>
<th>No. of units</th>
<th>Total Volume</th>
<th>Density (kg m⁻³)</th>
<th>Estimated weight (kg) before</th>
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<td>width</td>
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<td>AMERICAN RED OAK</td>
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<tr>
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<td>0.1229 1</td>
<td>0.1229 710</td>
<td>87.2261</td>
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</table>

| Construction process comment               |                             |

<table>
<thead>
<tr>
<th>Other Components (fittings, glues, finishes etc.)</th>
<th>Value</th>
<th>Quantity</th>
<th>Estimated in grams</th>
<th>No. of units</th>
<th>Estimated weight in kg</th>
<th>Construction process comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuerca Mariposa / Wing Nut</td>
<td>5</td>
<td>GRAMS</td>
<td>5</td>
<td>50</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>Tuerca Cega M8 Inox. / Blind Nut M8 Inox.</td>
<td>8</td>
<td>GRAMS</td>
<td>8</td>
<td>38</td>
<td>0.504</td>
<td></td>
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<tr>
<td>Tuerca Cega M10 Inox. / Blind Nut M10 Inox.</td>
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<td>GRAMS</td>
<td>8</td>
<td>16</td>
<td>0.128</td>
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<tr>
<td>Cable Acoro / Steel Cable</td>
<td>10</td>
<td>ml</td>
<td>10</td>
<td>13</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Bisagra Fresada / Milled Hinge</td>
<td>44</td>
<td>GRAMS</td>
<td>44</td>
<td>32</td>
<td>0.528</td>
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</table>
Environmental Life Cycle Assessment of The Smile

The Smile is better than carbon neutral at point of delivery to the site in London.
The Smile LCA – London Design Festival 2016

Cradle-to-site carbon footprint of The Smile

- Tulipwood replacement time
  - Less than 5 minutes
- Carbon stored
  - 71.7 MT CO₂ eq.
- Waste wood incineration
  - 120000 kWh
- Carbon footprint
  - - (minus) 5.6 MT CO₂ eq.
  - Better than carbon neutral
Emissions of 91.9 MT CO2 eq. are offset due to:

- **25.8 MT CO2 eq.** Burning of wood offcuts (which substituted for fossil fuel) at the factories in Germany, Italy and the UK.
- **71.6 MT CO2 eq.** The carbon stored in the wood in the finished design.
‘Limiting factor’
Species Tulipwood
Replacement time 8 seconds
Carbon stored 990 kg CO₂ eq.
Waste wood 1542 kWh generated
Carbon footprint 470 kg CO₂ eq.
Equivalent drive 3840 km

‘Lounge Chair’
Species Cherry
Replacement time 10 seconds
Carbon stored 136 kg CO₂ eq.
Waste wood 1011 kWh generated
Carbon footprint 1576 kg CO₂ eq.
Equivalent drive 12900 km
5 Australian & 1 New Zealand designer demonstrate how good design & US hardwoods can leave a light environmental footprint.
Manufactured in NZ
Thermally modified ash
26000 km by ship
1000 km by truck
Ash replacement time
Around 1 second
Carbon stored
96.8 kg CO₂ eq.
Carbon footprint
4.1 kg CO₂ eq.
Close to carbon neutral
Better than three-quarters of the specifiers indicated that (after reading a brief description about the LCA) this information would make them more likely to use/specify U.S. hardwood in the future.

**Affect of LCA on Likelihood to Use/Specify U.S. Hardwood**

- Much more likely to use/specify U.S. hardwood:
  - Europe: 32%
  - Middle East: 41%
  - LA/Caribbean: 40%
  - Oceania: 33%
  - India: 30%
  - China/SE Asia: 20%
  - Japan: 13%

- Somewhat more likely to use/specify U.S. hardwood:
  - Europe: 36%
  - Middle East: 34%
  - LA/Caribbean: 30%
  - Oceania: 0%

- Neither more nor less likely to use/specify U.S. hardwood:
  - India: 2%
  - China/SE Asia: 3%

- Somewhat less likely to use/specify U.S. hardwood:
  - Oceania: 3%

- Much less likely to use/specify U.S. hardwood:
  - Japan: 1%

**Top 2 box**

<table>
<thead>
<tr>
<th>Region</th>
<th>Europe</th>
<th>Middle East</th>
<th>LA/Caribbean</th>
<th>Oceania</th>
<th>India</th>
<th>China/SE Asia</th>
<th>Japan</th>
</tr>
</thead>
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</tr>
</tbody>
</table>

Q28. After reading this information, would you be...?
“THE AMERICAN MIRACLE”
POR EL PLANETA
Questions?