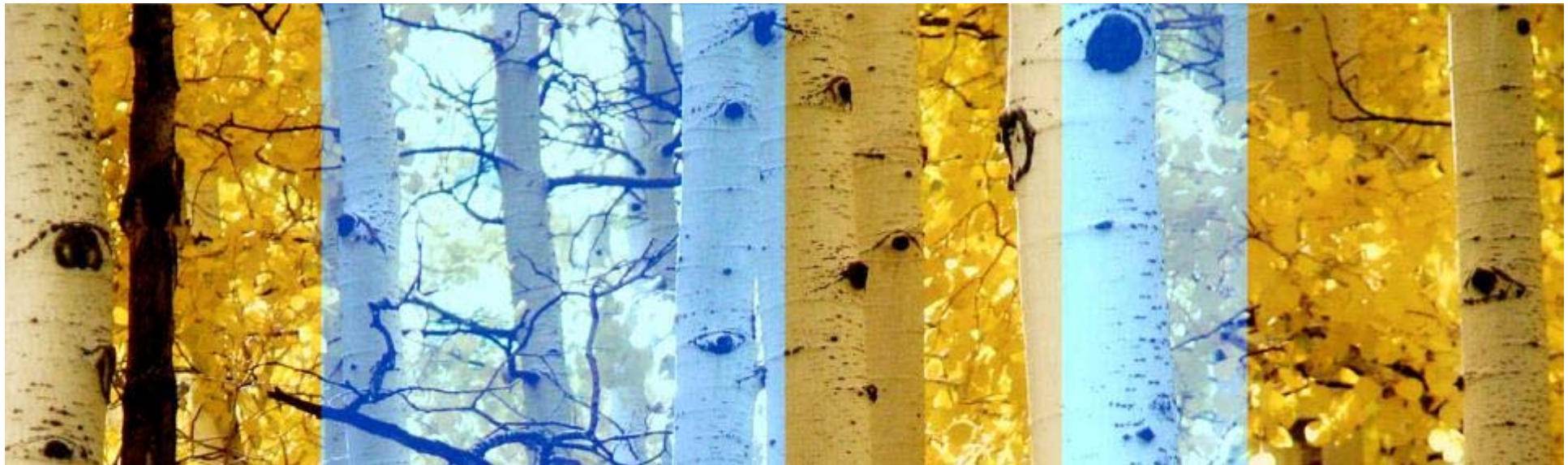


Current Situation in the Global Plywood Industry

Garnica Plywood



18.05.2015



Indufor ...forest intelligence

Indufor Group

Indufor Group is one of the world's leading forest consulting service providers. We provide high-quality knowledge and services for our clients over the forest and forest industry value chains, adding value to our clients and to all the affected communities.

- **Helsinki, Finland**

The head office comprises some 30 persons with advanced university degrees.

- **Auckland, New Zealand**

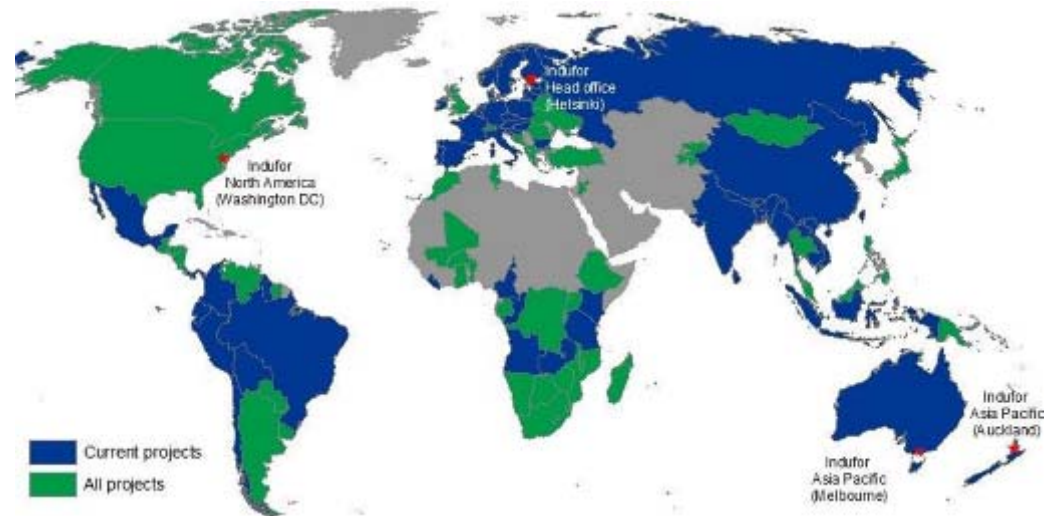
The office has some 20 highly capable consulting staff members.

- **Melbourne, Australia**

The office currently has some 10 well-experienced consulting staff members.

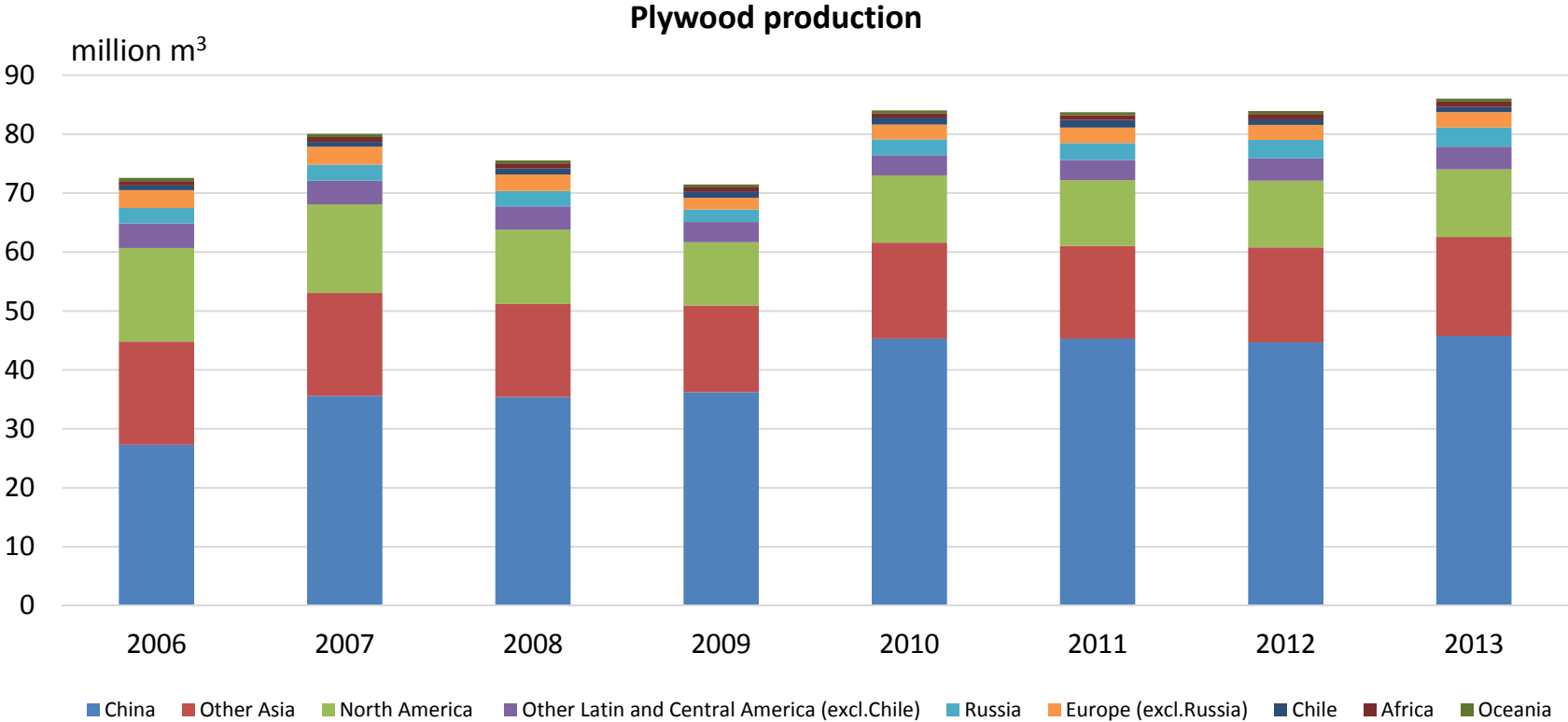
- **Washington DC, USA**

Latest office focusing on North American markets.



Plywood – Production by Key Regions

Production growth in China has increased the total global plywood output with Russia the only other major producer country showing steadily increasing volumes. Production in Indonesia has also picked up during the last years but is still clearly below the peak years in production.



Plywood – Production by Key Regions

- Production in **Europe** and **North America** still well below peak years whereas **Russia** has been able to expand its production driven by competitiveness on major export markets.
- Production in **China** continuing to be strong supported by significant construction activity, domestic processing industries and raw material supply from plantations.
- **Japanese** output has remained stable with imports matching the domestic supply.
- Decline in **other Asian** countries slowing down.
- **Chile** has strengthened its position as the forerunner in Latin America.
- **Oceanian** plywood production has been stable focusing on serving local markets.



Plywood – Substitution

The consumption of OSB has increased in Europe, but it is seen more as a substitute for plywood imported from Brazil and Chile. Russia holding raw material reserves for OSB production.

- In **Europe**, OSB is the main substitute product for plywood in residential and non-residential construction.
- Hardwood plywood faces limited competition from materials such as plastics, MDF/PB, and steel (depending on end-use). However within hardwood plywood, the real competition is between different species and sources of plywood.
- Substitution pressure is limited to construction applications in **Russia** which in many places possesses plenty of suitable but underutilized raw material sources for OSB production.
- OSB's cost advantage over softwood plywood has widened in **North America** and also OSL/LSL is forecast to gain market share in the future.
- OSB is expected to substitute plywood in lower value end uses in **Latin America**.
- Plywood's position has stabilized in **Asia** and it is expected to maintain a significant role in both interior and exterior end uses throughout the region.

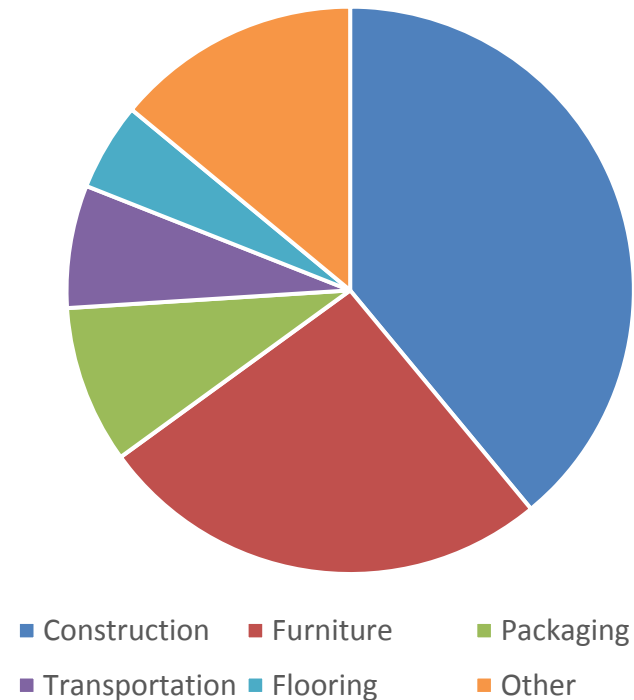


Plywood – End-uses

Plywood has well-established position in many of its applications.

- All key customer segment markets are below long-term trend and have a positive volume outlook.
- For example, due to its good strength-to-weight ratio, maintainability and price, no substitutes are observable in the market.
- There is limited expectation of a shift in application use of plywood.
 - There is a slight increase in use of plywood in construction due to the increase in use of wooden housing.
 - There is a slowing shift from medium to heavy trucks (with trailers) but each tend to use the same amount of plywood.
- Use of plywood vs. other products appears largely stable.

Plywood End-uses Globally



Plywood – Demand Outlook by End-Use

Construction and flooring growth will depend on the recovery in the U.S. and Europe.

Substitution pressures. Furniture use depends on China. Transportation has a positive outlook.

Construction: Europe is still depressed market with eventual recovery expected, but time line is long and uncertain. In China, plywood consumption growth will moderate as the growth in construction slows down. USA: plywood consumption will grow, especially in multi-family houses. OSB more commonly used.

Furniture: Much of North American furniture manufacturing has moved to China in the beginning of millennium, future growth is more heavily driven by Chinese domestic consumption. In Europe, industry has moved to Eastern part of the EU, and to China. Demand growth will closely follow economy.

Packaging: Plywood is facing fierce competition by other materials, such as plastics, cardboard, metals.

Transportation: In Europe, commercial vehicles has some bent-up demand; investments and registrations of new vehicles lag behind. Recovery likely to be slow due to low latent demand in trailer market and long lifetimes for trailers. Medium truck latent demand high, however, and will need to revert in near to medium term.

Flooring: In Europe, a heavily depressed market due to dependence on residential new build. Recovery expected with housing market, but time line long and uncertain. The substitution risk is mainly related to development of parquet imports.



Plywood – Application Trends

In digital printing plywood is an interesting alternative to plastics and aluminium.

Rigid Substrate for Digital Printing

Plywood makes a great substrate for large format inkjet printing. Overlaid with a top coat based on alkyd and acrylic, plywood can be used as a rigid substrate for direct digital printing and silk screen printing. Pre-treated for direct print, it has a non-reflective white surface with excellent adhesive properties. Digital print quality is high, colour fast and UV tolerant.

The material is suitable for constructional, long-term outdoor end-uses, like signs and perimeter fences. It is durable and rigid – it endures the outside weather conditions well.

From a practical point of view, flatness is crucial in digital printing applications. In order to function properly, plywood must be completely even when laid on the vacuum flatbed!



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Plywood – Future Trends

Lignin-based resins make plywood even greener product.

Natural Wood Adhesives - Lignin-based Binders

Resin industry can develop resins that are environmentally-friendly but also help make economic savings for the industry.

When lignin is chemically treated, a reaction takes place so a resin is formed, making it possible to produce a Class 3 (exterior uncovered) plywood using this adhesive.

On an industrial scale, due to low reactivity and viscosity issues, it is possible to substitute 50% of phenols with a lignin-based binder, without compromising acceptable properties and performance. Phenol replacement rate of 75% has been reached in laboratory/pilot tests.

The pulping industry produces a significant amount of lignin every year, which is just not being separated from the black liquor. In the mid-term, lignin supply is not an issue.



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Plywood – Future Trends

China – Growth Potential and Market Power

The growth of Chinese plywood production is limited by raw material supply. The availability of cost-efficient logs is narrowing.

In 2012, the North American hardwood plywood industry filed a petition with the U.S. International Trade Commission to put a stop to Chinese dumping. The commission voted against the petition. To some extent, this can happen in Europe, too, although the U.S. market accepts lower grade product than Europe.

Could poplar plywood be vulnerable?

Plywood – Future Trends

Europe – Bioenergy Dilemma or an Opportunity?

In order for the EU member countries to meet renewable energy targets, the consumption of biomass energy in the transport fuels and the electricity sector is expected to grow significantly in the coming years.

As a result, to meet the increasing energy wood demand, the processing industry must provide a significant amount of their residuals to bioenergy use. Thus, demand of end products (sawnwood and plywood) must develop in proportion.

Sawlogs will drive the wood supply, not pulpwood or residuals. Particleboards and MDF will face increasing competition from bioenergy.

Plywood industry must promote plywood in construction applications and other industrial end uses.

Plywood – Future Trends

Africa Emerging!

Solid biological growth rates, low establishment and maintenance costs, land availability, and demand for forestry products make Africa an attractive forestry option. Typical emerging market risks as well as environmental and social issues are involved. Strong GDP growth in many countries increases the wood product demand.

The market for wood products is evolving. In order to easily replicate sophisticated final products, the furniture and building industries increasingly require raw materials with standard dimensions, which only plantations can offer.

There are large areas of aging/mature plantation forest available for harvest in Africa. The plantation timbers typically have a much higher recovery rate than many natural timbers (little or no sapwood, straight stems). Harvesting is also easier, more cost effective and comes with fewer environmental issues.

Now it's time to look for opportunities, before the Chinese have taken them all!

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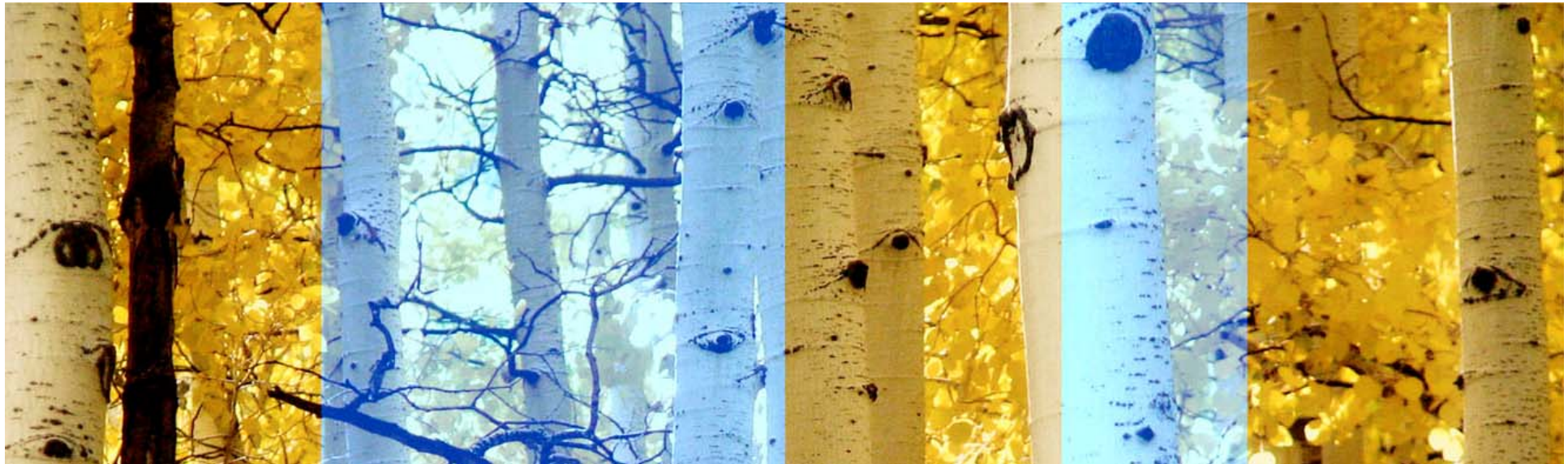
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