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Forestry makes an important contribution to New Zealand’s economy as the third largest export earner making up 3.2 percent of GDP. Together, forestry and its supporting services employ more than 18,000 people. Sustainably managed plantation forests also provide environmental benefits through sequestering carbon and delivering ecosystem services such as improving air and water quality.

The annual harvest in 2014 was 30 million cubic metres and moving into the next decade, this has the potential to increase by more than 40 percent. The forest plantings established in the 1990s are now maturing which means that there will be sufficient supply available to meet future domestic demand and boost forestry exports. There are also opportunities to increase the value of exports through further processing and manufacturing within New Zealand.

As a Minister with responsibility for forestry, I have had many opportunities to see the innovation and expertise within the sector, from our world leading research in radiata pine to grow better trees, to the new technologies enabling safer harvesting on steeper land, and the development of high quality engineered timber products. Together these initiatives can help the industry move towards the Wood Council of New Zealand’s (Woodco’s) target of $12 billion in forest and wood product exports by 2022.

This publication provides a useful summary of key information about New Zealand’s plantation forests. I hope that it will be of value to all those within the industry and government who have an interest in growing and supporting the forestry sector. I look forward to continuing to assist the forestry industry reach its full potential.

Hon Jo Goodhew
Associate Minister for Primary Industries
New Zealand Economic Indicators
As at 31 December 2014

<table>
<thead>
<tr>
<th></th>
<th>31 Dec 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>4,513,000</td>
</tr>
<tr>
<td>GDP $ Billion</td>
<td>214.6</td>
</tr>
<tr>
<td>GDP per capita $</td>
<td>47,570</td>
</tr>
<tr>
<td>Exports $ Billion</td>
<td>48.3</td>
</tr>
<tr>
<td>Forest products exports total $ Billion</td>
<td>4.8</td>
</tr>
<tr>
<td>Total overseas debt $ Billion</td>
<td>153.9</td>
</tr>
<tr>
<td>Annual percentage change GDP (as at 31 March 14)</td>
<td>2.5%</td>
</tr>
<tr>
<td>Inflation (as measured by annual percentage change in CPI)</td>
<td>0.80%</td>
</tr>
<tr>
<td>Forestry sector contribution to GDP</td>
<td>3.20%</td>
</tr>
</tbody>
</table>

Note:
• GDP in 2009/2010 prices
Source: Statistics NZ

New Zealand Land Use
As at June 2014

- Plantation forest 1.7m ha
- Pasture & arable land 11.1m ha
- Other non-forested land 6.1m ha
- Natural forest 7.8m ha

Note:
• In some cases 2013 is the most recently available data
• This figure now comes from a different source which includes regenerating natural forest as well as established natural forest
• Plantation forest excludes harvest area awaiting replanting

Source: MPI and Statistics NZ
New Zealand Planted Forestry in Summary

### Area and standing volume statistics

<table>
<thead>
<tr>
<th></th>
<th>1 April '12</th>
<th>1 April '13</th>
<th>1 April '14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net stocked forest area (ha)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total estimated area</td>
<td>1,719,500</td>
<td>1,728,500</td>
<td>1,746,500</td>
</tr>
<tr>
<td><strong>Growth characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing volume (000 m³)</td>
<td>488,437</td>
<td>512,137</td>
<td>493,723</td>
</tr>
<tr>
<td>Average standing volume (m³/ha)</td>
<td>284</td>
<td>296</td>
<td>283</td>
</tr>
<tr>
<td>Area-weighted average age (years)</td>
<td>16.4</td>
<td>16.8</td>
<td>16.8</td>
</tr>
<tr>
<td><strong>Area by species (ha)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiata pine</td>
<td>1,543,000</td>
<td>1,553,700</td>
<td>1,572,200</td>
</tr>
<tr>
<td>Douglas-fir</td>
<td>108,000</td>
<td>106,500</td>
<td>105,200</td>
</tr>
<tr>
<td>Cypress species</td>
<td>10,000</td>
<td>10,100</td>
<td>9,900</td>
</tr>
<tr>
<td>Other exotic softwoods</td>
<td>24,000</td>
<td>23,600</td>
<td>23,000</td>
</tr>
<tr>
<td>Eucalyptus species</td>
<td>23,000</td>
<td>22,000</td>
<td>23,000</td>
</tr>
<tr>
<td>Other exotic hardwoods</td>
<td>13,000</td>
<td>12,600</td>
<td>12,400</td>
</tr>
</tbody>
</table>

### Planting statistics

<table>
<thead>
<tr>
<th></th>
<th>Year ended 31 Dec '11</th>
<th>Year ended 31 Dec '12</th>
<th>Year ended 31 Dec '13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New planting (ha)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total estimated new planting</td>
<td>12,000</td>
<td>11,500</td>
<td>3,500</td>
</tr>
<tr>
<td>Restocking</td>
<td>39,300</td>
<td>45,154</td>
<td>40,867</td>
</tr>
<tr>
<td>Harvested area awaiting restocking</td>
<td>60,500</td>
<td>51,869</td>
<td>44,642</td>
</tr>
</tbody>
</table>

### Harvesting statistics

<table>
<thead>
<tr>
<th></th>
<th>Year ended 31 Mar '12</th>
<th>Year ended 31 Mar '13</th>
<th>Year ended 31 Mar '14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Harvesting (ha)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area clear felled (ha)</td>
<td>44,100</td>
<td>50,342</td>
<td>46,001</td>
</tr>
<tr>
<td>Volume clear felled (TRVIB,000 m³)</td>
<td>23,312</td>
<td>26,296</td>
<td>23,437</td>
</tr>
<tr>
<td>Volume production thinned (TRVIB,000 m³)</td>
<td>90</td>
<td>307</td>
<td>244</td>
</tr>
<tr>
<td>Total volume removed (TRVIB,000 m³)</td>
<td>23,402</td>
<td>26,603</td>
<td>23,681</td>
</tr>
<tr>
<td>Average clear fell yield (m³/ha)</td>
<td>529</td>
<td>530</td>
<td>519</td>
</tr>
<tr>
<td>Area-weighted average clear fell age for radiata pine (years)</td>
<td>28.6</td>
<td>27.7</td>
<td>28.9</td>
</tr>
<tr>
<td>Estimated planted forest roundwood removal (000m³)¹</td>
<td>25,971</td>
<td>28,030</td>
<td>30,212</td>
</tr>
</tbody>
</table>

**Notes:**
- TRVIB is an abbreviation for Total Recoverable Volume Inside Bark.
- ¹ This is an indirect estimate based on the application of conversion factors to the various forestry products.

**Source:** NEFD 2010, NEFD 2011, NEFD 2014

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Global Forest Coverage

### Global Forest Areas

- **North and Central America 18%**
- **South America 21%**
- **Oceania 5%**
- **Asia 15%**
- **Europe 25%**
- **Africa 16%**

Total 4,111 million hectares

There is an estimated 4 billion hectares of forest globally. 36% of this is considered primary forest, 57% is forest that has naturally regenerated and approximately 7% is planted.

---

- **Total 264 million hectares**

Between 2000 and 2010 there was a net change in global forest area of approximately -5.2 million hectares, with around 13 million hectares being converted to other uses.

**Source:** FAO Global Forest Resources Assessment 2010
### Industry Employment

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry</td>
<td>720</td>
<td>740</td>
<td>730</td>
</tr>
<tr>
<td>Logging</td>
<td>3,920</td>
<td>3,960</td>
<td>3,970</td>
</tr>
<tr>
<td>Services to Forestry</td>
<td>2,280</td>
<td>2,310</td>
<td>2,210</td>
</tr>
<tr>
<td>Forestry and Logging</td>
<td>6,920</td>
<td>7,010</td>
<td>6,910</td>
</tr>
<tr>
<td>Log Sawmilling</td>
<td>5,420</td>
<td>5,130</td>
<td>5,020</td>
</tr>
<tr>
<td>Wood Chipping</td>
<td>25</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Timber Resawing and Dressing</td>
<td>1,780</td>
<td>1,740</td>
<td>1,800</td>
</tr>
<tr>
<td>Plywood and Veneer Manufacturing</td>
<td>1,210</td>
<td>1,230</td>
<td>1,220</td>
</tr>
<tr>
<td>Fabricated Wood Manufacture</td>
<td>800</td>
<td>800</td>
<td>760</td>
</tr>
<tr>
<td>Pulp, Paper and Paperboard Manufacturing</td>
<td>1,780</td>
<td>1,860</td>
<td>1,760</td>
</tr>
<tr>
<td>Sawmill and Manufacturing</td>
<td>11,015</td>
<td>10,790</td>
<td>10,585</td>
</tr>
<tr>
<td>Total Forestry and First Stage Processing</td>
<td>17,935</td>
<td>17,800</td>
<td>17,495</td>
</tr>
</tbody>
</table>

**Notes:**
- Employee count is a head-count of all salary and wage earners for the February reference month. Previous releases in this series described “Persons engaged” (total number of full-time employees and working proprietors (ie number of persons working 30 hours or more per week plus half the number of persons working part-time), and so the data is not strictly comparable with previous releases in this series.

### Workforce

![Graph showing workforce by year](image)

### Industry Training

#### Trainee Count (2014)

<table>
<thead>
<tr>
<th>Year</th>
<th>Trainees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2,000</td>
</tr>
<tr>
<td>2012</td>
<td>4,000</td>
</tr>
<tr>
<td>2013</td>
<td>1,000</td>
</tr>
</tbody>
</table>

#### Forestry Trainee Count (2014)

<table>
<thead>
<tr>
<th>Year</th>
<th>Trainees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2,000</td>
</tr>
<tr>
<td>2012</td>
<td>4,000</td>
</tr>
<tr>
<td>2013</td>
<td>1,000</td>
</tr>
</tbody>
</table>

#### Trainees by Ethnicity (2014)

- European: 1%
- Asian: <1%
- Indian: 1%
- Other Ethnicity: 1%
- Pacific Peoples: 5%
- Not stated: 4%
- New Zealand European: 50%
- Maori: 38%

**Source:** Competenz

**Source:** Statistics NZ
Health and Safety

Fatal notifications

![Graph showing fatal notifications from 2010 to 2015]

- Fatal notifications: Bar chart showing the number of fatal notifications per year from 2010 to 2015.
- Trend (Fatal notifications): Line chart showing the trend of fatal notifications from 2010 to 2015.

1 This figure only up to May 2015

Serious harm notifications

![Graph showing serious harm notifications from 2010 to 2015]

- Serious harm notifications: Bar chart showing the number of serious harm notifications per year from 2010 to 2015.
- Trend (Serious harm notifications): Line chart showing the trend of serious harm notifications from 2010 to 2015.

2.4% of the New Zealand forestry workforce (1 worker out of 40) was involved in an accident resulting in serious harm or death in 2013.

94.50% Of all plantation forests in New Zealand are privately owned.

33% Of New Zealand plantation forests are in the Central North Island.

90% Of all New Zealand plantation forests are planted with *pinus radiata*, with a majority of other species being planted in the South Island.

84% Of all logs harvested in 2014 were used for quality production or export.

### Plantation Ownership

**Planted Forest Ownership – New Zealand**

- Privately owned 94%
- State-owned enterprise 1%
- Local Government 3%
- Central Government 2%

**Source:** NEFD 2014

**Note:**
- Ownership is based solely on the ownership of the forest irrespective of the ownership of the land.
- Net stocked planted production forest area.
- Note that significant changes in forest ownership occurred during 2003 resulting in large areas of forest previously owned by public companies now being privately owned.
- “Privately owned” includes all privately owned forests. The legal entities included in this category are private companies, partnerships, individuals and trusts, which include Māori trusts and incorporations.
- “Central Government” forests are predominantly Crown owned forests on Māori leasehold land. These forests are managed by the Ministry for Primary Industries.

**Planted Forest Ownership – International**

- Smallholders 26%
- Government/Public 57%
- Corporate/Private 17%

**Source:** Planted Forests in Sustainable Management – A statement of principles FAO, 2010
## Commercial Planted Forest Ownership and Management

### Ownership of Forest Land

**As at 31 December 2014**

<table>
<thead>
<tr>
<th>Firm/Entity</th>
<th>Freehold</th>
<th>Leasehold</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hancock Natural Resource Group</td>
<td>106,094</td>
<td>25,003</td>
<td>238,155</td>
</tr>
<tr>
<td>Kaingaroa Timberlands</td>
<td>1,394</td>
<td>180,856</td>
<td>182,261</td>
</tr>
<tr>
<td>Rayonier/Matariki Forests</td>
<td>54,764</td>
<td>27,945</td>
<td>123,136</td>
</tr>
<tr>
<td>PF Olsen Ltd</td>
<td>92,182</td>
<td>15,000</td>
<td>109,182</td>
</tr>
<tr>
<td>Global Forest Partners LP</td>
<td>26,397</td>
<td>55,065</td>
<td>88,646</td>
</tr>
<tr>
<td>Ernslaw One1</td>
<td>58,060</td>
<td>19,731</td>
<td>113,159</td>
</tr>
<tr>
<td>Crown Forestry (MPI)</td>
<td>8,573</td>
<td>14,071</td>
<td>19,216</td>
</tr>
<tr>
<td>Juken New Zealand</td>
<td>16,700</td>
<td>15,122</td>
<td>31,822</td>
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<tr>
<td>Juken New Zealand</td>
<td>2,218</td>
<td>34,226</td>
<td>36,444</td>
</tr>
<tr>
<td>Pan Pac Forest Products</td>
<td>4,221</td>
<td>23,222</td>
<td>27,443</td>
</tr>
<tr>
<td>GMO Renewable Resources</td>
<td>25,570</td>
<td>26,084</td>
<td>51,654</td>
</tr>
<tr>
<td>Hikurangi Forest Farms</td>
<td>25,000</td>
<td>25,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Wenita2</td>
<td>25,000</td>
<td>27,570</td>
<td>52,570</td>
</tr>
<tr>
<td>Roger Dickie NZ3</td>
<td>24,000</td>
<td>26,576</td>
<td>50,576</td>
</tr>
<tr>
<td>Blakely Pacific</td>
<td>23,000</td>
<td>23,222</td>
<td>46,222</td>
</tr>
<tr>
<td>Forest Enterprises</td>
<td>21,000</td>
<td>21,000</td>
<td>42,000</td>
</tr>
<tr>
<td>City Forests</td>
<td>16,000</td>
<td>16,300</td>
<td>32,300</td>
</tr>
<tr>
<td>Lake Taupo Forest Trust4</td>
<td>15,000</td>
<td>17,795</td>
<td>32,795</td>
</tr>
<tr>
<td>Summit Forests NZ Ltd</td>
<td>-</td>
<td>23,700</td>
<td>23,700</td>
</tr>
<tr>
<td>Others (under 10,000 ha)</td>
<td>608,000</td>
<td>629,000</td>
<td>629,556</td>
</tr>
<tr>
<td><strong>Total Plantation Forest Area</strong></td>
<td>1,719,000</td>
<td>1,720,000</td>
<td>3,439,000</td>
</tr>
</tbody>
</table>

**Note:**
1. Includes forests owned by Timbergrow Ltd but managed by Ernslaw One Ltd
2. Crown land includes land leased under Crown Forest Licence
3. Lake Taupo Forest Trust is managed by New Zealand Forest Managers

---

**Source:** FOA
## Plantation Forest Management Statistics

As at 31 December 2014

<table>
<thead>
<tr>
<th>Firm/Entity</th>
<th>TIMO</th>
<th>Property Mgmt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hancock Forest Management (NZ) Ltd</td>
<td>237,823</td>
<td>199,258</td>
</tr>
<tr>
<td>Kaingaroa Timberslands</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rayonier/Mataki Forests</td>
<td>-</td>
<td>123,136</td>
</tr>
<tr>
<td>Global Forest Partners LP</td>
<td>22,887</td>
<td>65,759</td>
</tr>
<tr>
<td>Enslaw One</td>
<td>-</td>
<td>113,159</td>
</tr>
<tr>
<td>Crown Forestry (MPI)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Juken New Zealand</td>
<td>-</td>
<td>34,225</td>
</tr>
<tr>
<td>Pan Pac Forest Products</td>
<td>-</td>
<td>35,260</td>
</tr>
<tr>
<td>GMO Renewable Resources</td>
<td>18,500</td>
<td>-</td>
</tr>
<tr>
<td>Hikurangi Forest Farms</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wenita</td>
<td>-</td>
<td>27,565</td>
</tr>
<tr>
<td>Roger Dickie NZ</td>
<td>26,576</td>
<td>-</td>
</tr>
<tr>
<td>Forest Management NZ Ltd</td>
<td>-</td>
<td>26,576</td>
</tr>
<tr>
<td>Blakely Pacific</td>
<td>-</td>
<td>23,222</td>
</tr>
<tr>
<td>Forest Enterprises</td>
<td>20,666</td>
<td>-</td>
</tr>
<tr>
<td>City Forests</td>
<td>-</td>
<td>16,326</td>
</tr>
<tr>
<td>Lake Taupo Forest Trust</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>P F Olsen Ltd</td>
<td>2,720</td>
<td>149,685</td>
</tr>
<tr>
<td>Summit Forests NZ Ltd</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>329,172</td>
<td>814,170</td>
</tr>
</tbody>
</table>

**Note:**
Within “management” there are 2 main categories:

1. **Timberland Investment Management Organisation (commonly referred to as a TIMO)**
   These organisations do not own any forest. The forests are owned by retail investors or institutional funds.

2. **Property Management**
   - Planning and managing field operations, mapping and maintaining records.
   Some entities carry out both functions within the same organisation, others carry out both for some parts of a forest estate and not others.

---

## FSC Certified Forest Owner/Manager Cluster Group

<table>
<thead>
<tr>
<th>Company</th>
<th>Productive Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011 (As at 1 July)</td>
</tr>
<tr>
<td>Hancock Forest Management Ltd</td>
<td>222,720</td>
</tr>
<tr>
<td>Timberlands Ltd</td>
<td>187,544</td>
</tr>
<tr>
<td>Rayonier NZ</td>
<td>125,867</td>
</tr>
<tr>
<td>Enslaw One Ltd</td>
<td>102,107</td>
</tr>
<tr>
<td>Nelson Forests Limited</td>
<td>65,253</td>
</tr>
<tr>
<td>PF Olsen Ltd</td>
<td>63,110</td>
</tr>
<tr>
<td>Juken New Zealand Ltd</td>
<td>61,703</td>
</tr>
<tr>
<td>Summit Northern Plantation Ltd</td>
<td>-</td>
</tr>
<tr>
<td>Pan Pac Forest Products Ltd</td>
<td>33,597</td>
</tr>
<tr>
<td>NZ Forest Managers Ltd</td>
<td>33,509</td>
</tr>
<tr>
<td>Crown Forestry, MPI (West Coast)</td>
<td>29,733</td>
</tr>
<tr>
<td>Hikurangi Forest Farms Ltd</td>
<td>28,606</td>
</tr>
<tr>
<td>Wenita Forest Products Ltd</td>
<td>25,460</td>
</tr>
<tr>
<td>Blakely Pacific Ltd</td>
<td>22,385</td>
</tr>
<tr>
<td>City Forests</td>
<td>15,997</td>
</tr>
<tr>
<td>Southland Plantation Forest Company of New Zealand</td>
<td>9,900</td>
</tr>
<tr>
<td>Craigpine</td>
<td>3,371</td>
</tr>
<tr>
<td>Ngai Tahu Forest Estates Ltd</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total FSC Plantation Productive Area (ha)</strong></td>
<td>1,030,861</td>
</tr>
<tr>
<td><strong>Total NZ Productive Plantation Area (ha)</strong></td>
<td>1,773,700</td>
</tr>
<tr>
<td><strong>% Plantation Forest FSC Certified (ha)</strong></td>
<td>58%</td>
</tr>
<tr>
<td>Lindsay and Dixon (naturally regenerated indigenous)</td>
<td>11,719</td>
</tr>
<tr>
<td><strong>Total FSC Certification</strong></td>
<td>1,042,580</td>
</tr>
</tbody>
</table>

**Note:**
- Productive Area = Net Stocked Area + Area Awaiting Restocking
- Total Certified Area = Total Forest Area as recorded on FSC certificate

---

**Source:** FOA
### Plantation Forests by Location 2014

As at 1 April 2014

<table>
<thead>
<tr>
<th>Location</th>
<th>2012 Hectares</th>
<th>2013 Hectares</th>
<th>2014 Hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northland</td>
<td>202,559</td>
<td>201,196</td>
<td>191,512</td>
</tr>
<tr>
<td>Central North Island</td>
<td>552,097</td>
<td>553,956</td>
<td>587,104</td>
</tr>
<tr>
<td>East Coast</td>
<td>154,289</td>
<td>156,136</td>
<td>156,432</td>
</tr>
<tr>
<td>Hawke’s Bay</td>
<td>129,586</td>
<td>131,735</td>
<td>133,324</td>
</tr>
<tr>
<td>Southern North Island</td>
<td>166,076</td>
<td>165,811</td>
<td>162,779</td>
</tr>
<tr>
<td>Nelson/Marlborough</td>
<td>168,585</td>
<td>170,171</td>
<td>168,421</td>
</tr>
<tr>
<td>West Coast</td>
<td>32,466</td>
<td>32,351</td>
<td>31,775</td>
</tr>
<tr>
<td>Canterbury</td>
<td>110,055</td>
<td>111,981</td>
<td>108,371</td>
</tr>
<tr>
<td>Otago/Southland</td>
<td>203,788</td>
<td>205,163</td>
<td>206,885</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,719,501</strong></td>
<td><strong>1,728,500</strong></td>
<td><strong>1,746,603</strong></td>
</tr>
</tbody>
</table>

### Plantation Forests 2014

#### By age class at 1 April 2014

- **West Coast**: 2%
- **Canterbury**: 6%
- **Otago/Southland**: 12%
- **Northland**: 11%
- **Central North Island**: 33%
- **East Coast**: 9%
- **Hawke’s Bay**: 8%
- **Southern North Island**: 9%
- **Nelson/Marlborough**: 10%

#### Age class over time

- **Ages**: 1-5, 6-10, 11-15, 16-20, 21-25, 26-30, 31-35, 36-40, 41-50, 51-60, 61-80
- **Hectares**: 0, 100,000, 200,000, 300,000, 400,000, 500,000

Source: NEFD 2014
Plantation Species (Ha)
As at April 2014

North Island
- Cypress <1%
- Other Softwood 1%
- Douglas-fir 2%
- Radiata Pine 95%

South Island
- Other Hardwoods 1%
- Eucalypts 3%
- Other Softwood 3%
- Cypress 1%
- Douglas-fir 16%
- Radiata Pine 76%

Source: NEFD 2014

46%

Pinus spp. makes up approximately 46% of the estimated 53.4 million hectares of planted production forest worldwide, with Eucalypts the next largest at 26%.

FSC Strategic Review on the Future of Forest Plantations 2012
New Forest Planting (1987) and Deforestation (since 2005)
Year to 31 March 2014

Note:
• These estimates do not include immature forest cleared for other land uses

“According to the FAO “Aforestation is the act of establishing forests through planting and/or deliberate seeding on land that is not classified as forest, while reforestation refers to the re-establishment of forest through planting and/or deliberate seeding on land classified as forest, for instance after a fire, storm or following clearfelling.”

FAO Global Forest Resource Assessment 2010

Source: NEFD 2014

Typical Log Out-turn

Direct Sawlog Regime
Pruned and thinned to waste. Final Crop Stocking 228 spha.

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Volume</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste</td>
<td>8 m</td>
<td>0.18 m³</td>
<td>0%</td>
</tr>
<tr>
<td>Industrial grade logs</td>
<td>8 m</td>
<td>0.31 m³</td>
<td>7%</td>
</tr>
<tr>
<td>Sawlogs</td>
<td>15 m</td>
<td>1.15 m³</td>
<td>43%</td>
</tr>
<tr>
<td>Pruned logs</td>
<td>5 m</td>
<td>0.64 m³</td>
<td>50%</td>
</tr>
<tr>
<td>Stump</td>
<td>0.2 m</td>
<td>0.03 m³</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36 m</strong></td>
<td><strong>2.3 m³</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Structural Regime
No pruning. Thinned to waste. Final Crop Stocking 487 spha.

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Volume</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste</td>
<td>8 m</td>
<td>0.24 m³</td>
<td>0%</td>
</tr>
<tr>
<td>Industrial grade logs</td>
<td>8 m</td>
<td>0.41 m³</td>
<td>20%</td>
</tr>
<tr>
<td>Sawlogs</td>
<td>19 m</td>
<td>0.95 m³</td>
<td>80%</td>
</tr>
<tr>
<td>Pruned logs</td>
<td>0 m</td>
<td>0.00 m³</td>
<td>0%</td>
</tr>
<tr>
<td>Stump</td>
<td>0.2 m</td>
<td>0.01 m³</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35 m</strong></td>
<td><strong>1.61 m³</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Notes:
• SPHA = stems per hectare
• Average site (Site Index 29 m, 300 Index 23 m³/ha/yr). Clearfelled at 28 years

Source: Scion
Forest Management Trends

Radiata Pine 2014

Pruned without production thinning 13%
Unpruned without production thinning 2%
Pruned without production thinning 41%
Unpruned without production thinning 44%

There is an increasing trend of ‘unpruned without production thinning’ being adopted throughout the industry with a 4% increase in this practice since 2013. Additionally, there was a corresponding decrease of 3% in ‘pruned without production thinning’ practices.

Source: NEFD 2014
43\%  
Of all lumber was exported in 2014.

0.30\%  
Of all lumber was of indigenous origin.

35\%  
Of all exported logs leave New Zealand from the Port of Tauranga.

45\%  
Of all sawn timber exports leave New Zealand from the Port of Tauranga.

Source: MPI
Location of Major Wood Processors By Region 2014

Key:
S = Sawmill
P&P = Pulp and/or Paper
EWP = Engineered Wood Products
RWP = Reconstituted Wood Products
CLT = Cross Laminated Timber
WP = Wood Processing
P = Plywood
V = Veneer

Northland
Jukun New Zealand Ltd Triboard Mill (Kaitaia) (RWP)
Jukun New Zealand Ltd Northland Mill (Kaitaia) (S)
CHH Woodproducts, LVL (Marsden Point) (EWP)
CHH Woodproducts (Whangarei) (S)
Rosvall Sawmill (Whangarei) (S)
Northpine Sawmill (Bream Bay) (S)

Auckland
Thames Timber Ltd (Thames) (S)
Jenkin Timber (Auckland) (WP)
Goodwood Industries (Auckland) (WP)
Timberlab Solutions Ltd (Auckland) (WP)
Kopine (RWP)

Bay of Plenty
Claymark Sawmills (Katikati) (S)
Pupepine Sawmills (Te Puke) (S)
Whakatane Mill Ltd (Whakatane) (P&P)
Solid Timber Buildings Ltd (Tauranga) (WP)

Waikato
Moore Levesque and Morriss Ltd (Cambridge) (WP)
Otorohanga Timber Company (Otorohanga) (WP)
Kiwi Lumber (Putaruru) (S)

Central North Island
CHH Woodproducts, Plywood (Tokororoa) (P)
CHH Kinleith (Tokororoa) (P&P)
Claymark Rotorua Sawmill Ltd (Rotorua) (S)
Pedersen Holdings (Rotorua) (S)
Lockwood Group (Rotorua) (WP)
Hume Pine (Rotorua) (WP)
Verda (Rotorua) (WP)
CHH Woodproducts Kawerau Sawmill (Kawerau) (S)
Sequal Lumber (Kawerau) (S)
SCA Hygiene Australasia (Kawerau) (P&P)
CHH Tasman Ltd (Kawerau) (P&P)
Norske Skog Tasman Ltd (Kawerau) (P&P)
Laminex Group (Taupo) (RWP)
Tenon Ltd (Taupo) (S)
Winstone International (Ohakune) (S) (P&P)
McAlpines (Rotorua) (S)

East Coast
Juken New Zealand, Gisborne Mill (LVL)

Hawke’s Bay
Pan Pac Forest Products Ltd (Napier) (S)
Kanuka Engineered Wood Products Ltd (Hastings) (EWP)
East Coast Lumber (Wairoa) (S)

Southern North Island
Taranakipine Ltd (New Plymouth) (S/WP)
Juken New Zealand (Maserton) (EWP)
Kiwi Lumber (Maserton) (S)
Kiwi Lumber (Dannevirke) (S)
Clelands Timber Products Ltd (New Plymouth) (WP)

Nelson/Marlborough
Waimea Sawmillers Ltd (Nelson) (S)
Nelson Pine Industries (Richmond) (LVL)
Southpine Ltd (Nelson) (S)
Flight Timbers (Blenheim)
CHH Wood Products, Nelson Sawmill (Eves Valley) (S)
Hunter Laminates Nelson Ltd (Nelson) (WP)
Nelson Forests Limited (Renwick) (S)
XLAM (Nelson) (CLT)

Canterbury
Daiken (Rangiora) (RWP)
SRS New Zealand Limited (Rolleston) (S/WP)
Starwood Products Ltd (Timaru) (WP)
Southern Pine Products (Christchurch) (WP)
McAlpines (Rangiora) (WP)
Westco Lagan Limited (Christchurch) (WP)

West Coast
International Panel and Lumber Ltd (Greymouth) (PW)
Stillwater Lumber Limited (Greymouth) (S)
Westco Lagan Limited (Hokitika) (S)

Otago/Southland
Dongwha Patinna NZ Ltd (Mataura) (RWP)
Southland Veneers (Invercargill) (V)
Niagara Sawmilling Co Ltd (Invercargill/Ashtburton) (S/WP)
Pan Pac Otago (Mosgiel and Milton) (S)
Craigpine Timber Ltd (Winton) (S)
Stuart Timber Co Ltd (Tapanui) (S)

Source: WPMA and FIEA
Paper and Pulp Production

Panel Products Production

Production and Exports of Selected Forestry Products

Major Export Earners

Source: MPI, Statistics NZ

Note:
Excludes re-exports
Source: Statistics NZ and MPI

Source: MPI
The value of exported forest products decreased by approximately $177,419,000 on 2013 with the value of products to China decreasing by 1.40%. Increases of export value to India and Australia were noted in 2014, along with exports to 'other countries'.

Photo by Phil Taylor, Blakely Pacific Ltd

Source: Statistics NZ

---

Exports of Forestry Products from New Zealand

For Year Ended in December 2014

Export Product Value by Destination 2014

For Year Ended in December 2014

<table>
<thead>
<tr>
<th>Country of Destination</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>China, People's Republic of</td>
<td>1,456,486</td>
<td>2,111,462</td>
<td>1,969,160</td>
</tr>
<tr>
<td>Australia</td>
<td>755,255</td>
<td>679,077</td>
<td>692,961</td>
</tr>
<tr>
<td>Japan</td>
<td>542,037</td>
<td>480,508</td>
<td>434,050</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>396,259</td>
<td>488,067</td>
<td>462,015</td>
</tr>
<tr>
<td>India</td>
<td>187,730</td>
<td>219,384</td>
<td>271,300</td>
</tr>
<tr>
<td>United States of America</td>
<td>185,407</td>
<td>191,560</td>
<td>173,420</td>
</tr>
<tr>
<td>Indonesia</td>
<td>132,872</td>
<td>164,031</td>
<td>146,133</td>
</tr>
<tr>
<td>Philippines</td>
<td>102,651</td>
<td>82,644</td>
<td>83,494</td>
</tr>
<tr>
<td>Taiwan</td>
<td>85,705</td>
<td>92,564</td>
<td>80,258</td>
</tr>
<tr>
<td>Malaysia</td>
<td>79,207</td>
<td>68,330</td>
<td>63,854</td>
</tr>
<tr>
<td>Thailand</td>
<td>72,765</td>
<td>60,954</td>
<td>67,716</td>
</tr>
<tr>
<td>Vietnam</td>
<td>71,841</td>
<td>74,197</td>
<td>66,923</td>
</tr>
<tr>
<td>Hong Kong (Special Administrative Region)</td>
<td>14,129</td>
<td>13,464</td>
<td>12,929</td>
</tr>
<tr>
<td>Singapore</td>
<td>13,942</td>
<td>6,852</td>
<td>6,211</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>28,125</td>
<td>18,597</td>
<td>15,252</td>
</tr>
<tr>
<td>Other countries</td>
<td>176,568</td>
<td>228,288</td>
<td>256,886</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,300,979</td>
<td>4,979,980</td>
<td>4,802,562</td>
</tr>
</tbody>
</table>

Note: Data is provisional and does not include newsprint

---

Export Product Value by Destination 2014

For Year Ended in December 2014

Country of Destination

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logs &amp; Poles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lumber</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood Pulp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper &amp; Paperboard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel Products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Other Forestry Products</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Excludes re-exports. Newsprint data 12 months ending June 2010

Source: Statistics NZ
Top Export Destinations

Exports of forestry products by main countries of destination for the year ended December 2014 by value (NZ$000)

China, People’s Republic of

- Logs & poles: $NZ1,969,160 (80.54%)
- Sawn timber: $NZ146,134 (6.50%)
- Wood pulp: $NZ15,252 (0.75%)
- Paper & paperboard: $NZ12,929 (0.65%)
- Panel products: $NZ83,493 (4.42%)
- Other: $NZ25,688 (1.24%)

Australia

- Logs & poles: $NZ692,961 (80.54%)
- Sawn timber: $NZ87,115 (13.76%)
- Wood pulp: $NZ6,211 (0.83%)
- Paper & paperboard: $NZ462,015 (9.13%)
- Panel products: $NZ67,717 (4.97%)
- Other: $NZ15,252 (3.00%)

India

- Logs & poles: $NZ271,299 (69.58%)
- Sawn timber: $NZ66,922 (19.04%)
- Wood pulp: $NZ173,419 (22.98%)
- Paper & paperboard: $NZ434,048 (40.17%)
- Panel products: $NZ63,854 (11.62%)
- Other: $NZ46,796 (4.46%)

Note:
- Values are NZ$000 f.o.b.
- Paper and paperboard includes newsprint for June 2011 yr.
- All other forestry products include chips, mouldings, manufactures of paper and paperboard, furniture and miscellaneous forestry products.
- Other countries are all other countries to which New Zealand has exported forestry products during the year.

Source: Statistics NZ
Exports by Port (2014)
For Year Ended in December 2014

<table>
<thead>
<tr>
<th>Port of Loading</th>
<th>Sawn Timber</th>
<th>Logs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whangarei</td>
<td>3,501</td>
<td>2,588,534</td>
<td>2,592,035</td>
</tr>
<tr>
<td>Auckland</td>
<td>210,529</td>
<td>158,894</td>
<td>369,423</td>
</tr>
<tr>
<td>Tauranga</td>
<td>769,189</td>
<td>5,844,015</td>
<td>6,613,204</td>
</tr>
<tr>
<td>Gisborne</td>
<td>1,274</td>
<td>2,259,367</td>
<td>2,260,641</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>-</td>
<td>231,615</td>
<td>231,615</td>
</tr>
<tr>
<td>Napier</td>
<td>340,827</td>
<td>1,118,670</td>
<td>1,459,497</td>
</tr>
<tr>
<td>Wellington</td>
<td>4,250</td>
<td>818,518</td>
<td>822,768</td>
</tr>
<tr>
<td>Nelson</td>
<td>88,712</td>
<td>585,030</td>
<td>673,742</td>
</tr>
<tr>
<td>Picton</td>
<td>1,624</td>
<td>642,921</td>
<td>644,545</td>
</tr>
<tr>
<td>Christchurch</td>
<td>110,136</td>
<td>676,730</td>
<td>786,866</td>
</tr>
<tr>
<td>Timaru</td>
<td>878</td>
<td>457,279</td>
<td>458,157</td>
</tr>
<tr>
<td>Dunedin</td>
<td>62,197</td>
<td>808,559</td>
<td>870,756</td>
</tr>
<tr>
<td>Invercargill</td>
<td>110,050</td>
<td>395,503</td>
<td>505,553</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,703,168</strong></td>
<td><strong>16,585,635</strong></td>
<td><strong>18,288,803</strong></td>
</tr>
</tbody>
</table>

Log Exports by Port

- Whangarei 16%
- Auckland 1%
- Tauranga 35%
- Gisborne 14%
- New Plymouth 1%
- Napier 7%
- Wellington 5%
- Nelson 3%
- Picton 4%
- Christchurch 4%
- Timaru 3%
- Dunedin 5%
- Invercargill 2%

Sawn Timber Exports by Port

- Tauranga 45%
- Napier 20%
- Auckland 12%
- Invercargill 7%
- Nelson 5%
- Christchurch 7%
- Dunedin 4%

Note: Ports with <1% not included
Source: Statistics NZ
Sector Agreements and Initiatives

Members of the FOA are committed to the following agreements and initiatives:

New Zealand Forest Accord 1991
The New Zealand Forest Accord 1991 was updated in 2007 to reaffirm the principles of the 1991 Accord and respond to the threat of climate change. It is an agreement between conservation groups and most major plantation growers and users to:
- Define areas unsuitable for forestry
- Acknowledge that existing natural indigenous forest should be maintained
- Recognise commercial forests as essential
- Ensure any use of wood from indigenous forests is on a sustainable, value-added basis
- Ensure new plantation forests will not disturb areas of natural indigenous vegetation.

New Zealand Climate Change Accord 2007
Acknowledging, inter alia:
- The environmental benefits delivered by indigenous and plantation forests
- That carbon sequestration by forests is a key mechanism to offset greenhouse gas emissions
- That policies must be consistent with the Polluter Pays Principle, be broad-based and cover all greenhouse gases in all sectors, should avoid net increases in greenhouse gases, should promote the retention and expansion of indigenous forests and the replanting and expansion of plantation forests; ensure all sectors are taking responsibility, be consistent with customary rights and the Treaty of Waitangi and acknowledge that wood is a renewable, reusable and recyclable resource.

Eliminating illegal forest products
On 14 August 2008 a statement was signed in which the signatories called on the New Zealand government, importers, processors, retailers, New Zealand forest and plantation managers and processors of forest and plantation products to support their call to strongly oppose the import and the use of illegally harvested and traded forest products in New Zealand. Trading in illegal products contributes to deforestation, biodiversity loss, poverty and other adverse social effects, and undermines the viability of legal forest products.

Prohibition of the import of these products will benefit New Zealand’s legal forest products industries; assist in improving the producer countries’ social, environmental, and economic well being; and show that New Zealand is responsibly addressing the problem. Illegal logging is not sustainable and thus eliminating illegal logging is an important step towards achieving sustainable forestry globally.

Log Transport Safety Accord
Log truck operators and forest owners on 7 August 2008 signed an updated Log Transport Safety Accord designed to further improve the safety of all road users. Since the Accord was first signed in 2001 there has been a 65% reduction in log truck crashes, and a 75% reduction in rollover crashes, during a time of rapid growth in the logging industry. The Accord has been updated with the aim of reducing the rollover crash rate even further.

Principles for Commercial Plantation Forest Management in New Zealand
To promote understanding between the signatory parties with a view to New Zealand achieving environmental excellence in plantation forest management and participating as an effective advocate internationally for the sustainable management of plantation forests and the protection, preservation, and sustainable management of natural forests. These principles are complementary to the New Zealand Forest Accord (August 1991).

Forest Industry Safety Council
FOA is participating in the pan-industry initiative to improve health and safety in forestry. This initiative will largely be run by the Forest Industry Safety Council (FISC) which is chaired and managed by neutral third parties. The mission of FISC is to reduce the rates of serious injuries and deaths in the New Zealand plantation forest sector, with an ultimate goal of eliminating serious injuries and deaths in the sector. The purpose of FISC is:
- To foster cultural change in the plantation forest industry to ensure that safety is treated in the industry as an overriding priority and a shared responsibility throughout the sector
- To promote a safety conscious plantation forest sector
- To promote the competence and confidence of the plantation forest industry workforce in relation to work safety
- To promote effective safety programmes within companies operating in the plantation forest sector.

The organisations that signed the statement were: the Ecologic Foundation, Environment & Conservation Organisations of New Zealand (ECO), Greenpeace Aotearoa New Zealand, New Zealand Forest Owners Association, New Zealand Farm Forestry Association, New Zealand Pine Manufacturers Association, Royal Forest and Bird Protection Society, Sustainable Energy Forum, Wood Processors Association of New Zealand and WWF New Zealand.

www.nzfoa.org.nz
NZ Wood

Wood is the world’s most renewable raw material. For this reason forests and the wood they provide are vital in the fight against climate change. As the effects of global warming impact on our environment, the use of renewable and sustainable building materials has never been so important.

The stages of the wood story – planting and renewal, growth, harvesting and use – are part of a renewable cycle that takes and stores carbon dioxide from the atmosphere, making wood a better-than-carbon-neutral building material.

**Wood is the only construction material which has absorbed CO$_2$ from the atmosphere when produced, not emitted more**

During its production, one tonne of:
- Concrete – has released 159 kilos of CO$_2$ into the atmosphere
- Steel – has released 1.24 tonnes of CO$_2$ into the atmosphere
- Aluminium – has released 9.3 tonnes of CO$_2$ into the atmosphere
- Wood, however, has absorbed a net 1.7 tonnes of CO$_2$ from the atmosphere, over and above the energy expended in growing, harvesting and processing.

**The more timber you use in a house, the more CO$_2$ you remove from the atmosphere**
- It takes around 20 trees to build an average house frame
- A steel house frame has added 4.5 tonnes of CO$_2$ to the atmosphere
- A wooden house frame has absorbed 9.5 tonnes of CO$_2$ from the atmosphere
- Choosing timber options for an average house can take around 20 tonnes net of CO$_2$ out of the atmosphere (saving the equivalent of 150 trips Auckland to Wellington, or 7.1 years of car use)
- Using alternative materials (concrete, steel, brick and aluminium) can add 24 tonnes net CO$_2$ to the atmosphere (costing the equivalent of 180 trips Auckland to Wellington, or 8.6 years of car use).

Using wood is something we can all do to help the environment. By demanding and using more sustainably produced wood, we can ensure that more trees will be planted and more carbon dioxide will be absorbed from the atmosphere.

The result is a better world for ourselves, our families and future generations. It’s simple.

Wood. Our most renewable raw material.

www.nzwood.co.nz

Forest Growers Levy Trust

The Harvested Wood Material levy came into effect on 1 January 2014 with a rate of 27 cents per tonne. The levy collected $7,962,737 (ex GST) in its first year. The proceeds from the levy are overseen by the Forest Growers Levy Trust which has contracted the Forest Owners and Farm Forestry Associations to manage the annual work programme. The annual work programme consists of research and work which will benefit the industry as a whole. More information including the 2014 Annual Report, can be found at www.fglt.org.nz.

Expenditure by Category

- Research 78.0%
- Transportation 0.5%
- Biosecurity 14.2%
- Health, Safety & Training 1.6%
- Farm Forestry 1.7%
- Promotions 2.2%
- Fire 1.7%

Photo by Phil Taylor, Blakely Pacific Ltd

Source: FGLT 2014 Annual Report
NZ Forest Owners Strategic Plan

The Strategic Action Plan provides a pathway to shape a strong forest and wood products sector for the future.

The New Zealand plantation forest and wood products industry is based on wholly renewable resources, producing 100% of its products from plantation forests and recycled waste fibre; is New Zealand’s largest biomaterial recycler and has a very low carbon footprint. In the future it will be substantially independent of non-renewable energy inputs apart from transport fuel (and even this could be sourced from New Zealand wood in the long run). The industry already provides greenhouse gas offsets, reducing New Zealand’s overall carbon footprint.

Vision for the Plan

In the ten years to 2022 annual export earnings will more than double to $12 billion from a New Zealand forest and wood products industry that is:

• delivering innovative wood-based solutions from a sustainable resource to meet our customers’ needs
• manufacturing a range of high-value, fibre-based products, including new biochemical and biofuel value streams
• recognised as a world-leader in timber-engineered building solutions
• underpinned by forest growing as a valued and profitable land use
• recognised as a key New Zealand growth industry, delivering strong economic and environmental benefits
• connected and collaborative across the value chain, from end-product to seedling
• characterised by industry players that have pride in the wood products industry, with the sector regarded as a preferred career option for our brightest talent

Forest product export earnings for 2014 were $4.8 billion. On the current path of development by 2022 export earnings will be $6.1 billion. The Strategic Action Plan provides an alternative path targeting $12 billion export earnings by 2022.

Terms and Things

Area and volume

• A hectare (ha) = 100 x 100 metres (about the size of two rugby fields).
• A cubic metre (m³) = 1 metre x 1 metre x 1 metre (about three times the size of a household dishwasher).
• An average radiata pine tree yields 2.4 m³ of wood at harvest.
• 1 hectare of 28 year-old radiata pine contains between 650 and 800 m³ of wood.
• 1 hectare grows up to 28 m³ of wood each year.
• NZ radiata pine plantations yield up to 30% more wood per hectare than they did 60 years ago.
• A log truck and trailer contains approximately 30 tonnes of logs.
• A log ship contains approximately 30-35,000 tonnes of logs.

Photo by Phil Taylor, Blakely Pacific Ltd
Carbon Emissions and Sequestration

The Carbon Cycle

Planting trees begins a cycle that continuously removes, releases and reabsorbs greenhouse gases such as carbon dioxide. As trees grow, they absorb carbon dioxide through the process of photosynthesis.

The carbon dioxide absorbed by the growing forest remains stored within the wood products used throughout the lifetime of the building structure or product.

When a structure or product reaches the end of its lifetime, the carbon dioxide is released back into the atmosphere as the wood decays or is burnt as fuel.

Wood can be recycled to extend its lifetime and slow down the natural release of carbon dioxide back into the atmosphere. Once the carbon dioxide is released, it is available to be re-absorbed by growing trees.

When wood materials decay or are burnt as fuel they release carbon dioxide that was absorbed during the growth of the trees and are therefore carbon neutral.

New Zealand’s Greenhouse Gas Inventory – Key Points

In 2013, New Zealand’s total emissions were 81.0 million tonnes of carbon dioxide (Mt CO₂-e). Total emissions for New Zealand are now an estimated 14.2 Mt CO₂-e higher than in 1990 where emissions totalled 66.7 Mt CO₂-e.

26.8 Mt CO₂-e (net) was removed through the land use, land use change and forestry sector (LULUCF), therefore bringing New Zealand’s net emissions to 54.2 Mt CO₂-e in 2013. It is estimated that forestry land was responsible for removing 33.7 Mt CO₂-e (net) in 2013, an increase in removals of 3.5 Mt CO₂-e since 1990.

Agriculture continued to be the biggest contributor to New Zealand’s Greenhouse Gas emissions with 49% (39.2 Mt CO₂-e) of all emissions coming from this sector, while the energy sector was responsible for 39% (31.7 Mt CO₂-e). Both the waste and industrial processes and product use sectors contributed 6% of the emissions (5.1 Mt CO₂-e).

New Zealand contributes approximately 0.15% of all global emissions, however this amounts to approximately 17.21Mt CO₂-e per person, which ranks New Zealand highly amongst Annex 1 countries in terms of emissions per person.

How is carbon removed from the atmosphere by New Zealand’s forests?

Forests act as carbon sinks – a type of reservoir that removes and stores more carbon from the atmosphere than it releases. Trees use carbon dioxide (CO₂) as part of their ‘breathing’ cycle – taking in CO₂ and storing it within roots, trunks and branches – and releasing oxygen.

The amount of CO₂ a forest removes depends on the species grown and place in its growing cycle. A young forest will remove smaller amounts of CO₂ until the trees establish and enter a growing phase – this is when forests will remove the most carbon. As a forest ages and its growing process slows, it will revert to absorbing less carbon again.

At harvesting, the forest ceases to be a carbon sink but instead of releasing all the carbon it has stored, the harvested wood retains some of it. All wood products store carbon that will eventually be released, however the rate at which that carbon is released depends on the type of product and the type of treatment the wood has undergone. Studies are still being conducted into these release rates.

How much carbon removed by New Zealand’s forests is therefore dependent on the coverage of forestland, the age of the trees and the rate of harvest. In 2013, the net amount of carbon removed by the LULUCF sector was 26.8 MtCO₂-e. This number takes into account the approximately 8,500 hectares of forest that was lost in 2013.

Emissions by Sector

Industrial Processes and Product Use 6%
Waste 6%
Agriculture 49%
Energy 39%

As at April 2015

Thanks to: MFE
Source: Snapshot April 2015 Info 735,
New Zealand’s Greenhouse Gas Inventory 1990-2013 (MFE)
Carbon Yield: Multiple Rotations

This is the classic sawtooth carbon sequestration graph for a plantation stand. It shows the sequestration and loss of carbon in the system over time. It records the gradual sequestration of carbon in the different layers (leaves, roots and litter) and the assumed release when the crop is harvested. Note the difference in release at harvesting time for the different layers, with a level of carbon being retained as sequestered, despite the crop being harvested.

The graph is for an unpruned stand, harvested age 30, waste thinned at age 6 to 450 spha, then replanted after harvest.

The choice of harvest age is dependent upon the crop owner’s principal stand objective (timber, carbon, etc).

Graph shows CO₂ equivalent (CO₂ tonnes = 44/12xCarbon tonnes).

Note:
Growth Modelling region: Waikato Taupo, Latitude 37.8, Altitude 495 m
300 Index 29.0 m³/ha/year, Site index 34.8 m

Export & Domestic Log Pricing

Photo by Phil Taylor, Blakely Pacific Ltd
## Log Type, Pricing Point and Market

| Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| **EXPORT (NZ$ per JAS m³ f.o.b)** |                         |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| J Grade-Japan | 116 | 85-87 | 74 | 73 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| All grades average per quarter | 119 | 103 | 103 | 103 | 132 | 137 | 130 | 136 | 150 | 147 | 114 | 121 | 122 | 119 | 135 | 146 | 154 | 157 | 154 | 132 | 127 | 153 |

### DOMESTIC (NZ$ per tonne delivered at mill)

| Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     | Quarter     |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| S1 | 95-97 | 84-90 | 84-92 | 83-87 | 88-97 | 88-97 | 88-97 | 88-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 | 89-97 |
| S2 | 75-88 | 77-87 | 80-85 | 82-87 | 89-91 | 94-103 | 89-101 | 90-102 | 92-103 | 86-105 | 88-100 | 88-97 | 90-107 | 90-110 | 90-113 | 92-118 | 91-123 | 101-111 | 104-109 | 98-105 |
| S3 and L3 | 84-69 | 64-67 | 64-75 | 67-74 | 72-77 | 75-84 | 81-94 | 80-86 | 82-92 | 81-92 | 82-81 | 76-99 | 77-90 | 77-90 | 92-90 | 83-100 | 75-106 | 75-102 | 86-108 | 90-115 | 81-100 | 86-100 |

### Notes:
- * Limited response – very small volume traded
- .. Data not available

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### 2014 Facts & Figures content details

#### References
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- Ministry for Primary Industries, 2014; Situation and Outlook for Primary Industries 2014 Mid-year update (December 2014)
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#### Special thanks
- Thanks to MPI, WPMA and MfE

#### Disclaimer
Every effort has been made to ensure that the statistics and information found within this publication are accurate and fair. The Forest Owners Association provides no warranty as to accuracy and shall not be liable to any person for any loss or damage for the use, directly or indirectly, of the information.

Source: MPI