

Sixteen21

2016 Overview and 2021 Outlook

Sixteen21 provides a succinct overview and summary of Australian and New Zealand paper, paper product, pulp and fibre supply markets for 2015–16 and the prior decade, as well as the outlook and IndustryEdge's consumption forecasts through to 2021.



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Your five year **Overview and Outlook**

2016 is the first year in which Appita and IndustryEdge have combined their separate technical and market data, information and intelligence into one Overview & Outlook document.

This 2016 Overview and 2021 Outlook provides a snapshot and easy reference tool to help navigate the Australian and New Zealand paper & paperboard markets and industry. Sixteen21 has been designed to deliver key information in a graphic and easily understood manner. It is ideal for business leaders, policy makers and analysts needing a quick introduction or ready reference to Australia and New Zealand's paper markets and industry.

Much of the content comes directly from IndustryEdge's annual Pulp & Paper Strategic Review (now in its 25th annual edition) and many readers will recognise the format of Sixteen21. What is new is that this snapshot delivers the key points about this multi-billion dollar sector in just 36 pages.

Thanks to the support of our association partners, Sixteen21 is being supplied, free of charge, to more than 12,000 individuals in Australia, New Zealand and throughout Asia.

This is the second edition of what is intended to be a useful and easy to use addition to your business information tools. Because it is an annual publication, we know it will be used across 2017, until the next edition is published.

We welcome your feedback and discussion with you about your business needs and how IndustryEdge and Appita can assist you to meet them.



Tim Woods,
Managing Director,
IndustryEdge



Adele Elice-Invaso,
Executive Director,
Appita

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The market for paper, paperboard and paper products in Australia and New Zealand is mature, with consumption stable. In 2016, the trend is moving back towards domestic manufacturing, driven by lower value domestic currencies, export opportunities and in some cases, the prospect of import replacement.

In total, demand for paper and paperboard increased in Australia and New Zealand, due to strong growth in the Packaging & Industrial sector.

In 2016, total demand for all grades of paper and paperboard in Australia was 2.6% higher than the year before. At 3.25 million tonnes, total demand lifted for the first time in almost 10 years, off the back of strong growth in the Packaging and Industrial grade. Demand varied widely across the major grades of paper and paperboard.

Consumption trends were also uneven across the different grades of paper and paperboard in New Zealand. At 0.76 million tonnes, total demand decreased by 11,300 tonnes in 2016, despite growing demand for Packaging and Industrial papers.

To the year ended 30th June 2016, demand and demand growth for each sector is displayed in the following table.

Per capita consumption of paper and paperboard is declining

Measuring paper and paperboard consumption on a per capita basis provides a useful economic indicator of the sector’s importance to an economy, rather than demonstrating each individual’s personal consumption.

In Australia in 2016, per capita consumption of paper and

paperboard was 135 kg per person, a rise of just 1 kg per person over the year.

In New Zealand in 2016, per capita consumption of paper and paperboard was 161 kg per person, a decline of 2 kg per person over the year.

The difference in the two countries’ per capita consumption is explained by the significance of the packaging and industrial paper sector to the New Zealand economy, especially for export of dairy and other primary products.

Demand growth is forecast to 2021

In both Australia and New Zealand, demand growth is forecast through to 2021. However, that growth is forecast to be slow and below the rate of economic growth in each country.

In Australia, demand growth will total just 3.9% over the five years (averaging 0.8% per annum) and in New Zealand, a slightly higher 4.2% (also averaging 0.8% per annum).

Changes in industry & markets

Despite apparent demand stability, consumption trends are uneven across the different grades of paper and paperboard.

YE 30th June 2016	Australia		New Zealand	
	tonnes	% Change on prior year	tonnes	% Change on prior year
Newsprint	336,000	-4.4	114,400	-11.9
Printing & Communication	1,104,200	-6.2	167,600	-2.5
Tissue	280,900	2.6	56,600	-4.9
Packaging	1,532,300	12.1	418,300	2.8

Source: IndustryEdge

Australia's forecasts of total demand growth are shown in the table below

Forecasts of Total Paper & Paperboard Demand in Australia: 2016* – 2021 (ktpa)						
Year to June:	2016*	2017	2018	2019	2020	2021
Forecast	3,253	3,278	3,302	3,321	3,350	3,380
Increment		25	24	19	29	30

Source: ABS Long Term Forecasts Australia, 2016 - 2031 & IndustryEdge research and estimates * = Actual

New Zealand's forecasts of total demand growth are shown in the table below

Forecasts of Total Paper & Paperboard Demand in New Zealand: 2015* – 2020 (ktpa)						
Year to June:	2016*	2017	2018	2019	2020	2021
Forecast	757	764	771	778	784	789
Increment		7	8	7	6	5

Source: Statistics NZ, NZRB & IndustryEdge research and estimates * = Actual

Evidence of the decline in demand for Newsprint and Printing and Communication papers has been clear for some years and continued in 2016.

Market dynamics continued to challenge the Tissue products sector, especially the ongoing role of domestic manufacturers in Australia and to a lesser extent New Zealand.

Packaging and Industrial papers provided the majority of growth and development, as Australasia exports growing volumes of food to Asia and packaging paper and paperboard to the world.

The headline events and market defining factors and events of 2016 included:

- Currency stability, especially for the Australian Dollar relative to the US Dollar, placed imports into stark relief as factors other than exchange rates impacted movements in imports
- Imports to Australia declined 3.5% in total while imports to New Zealand rose 0.9% compared with the prior year
- Exports from Australia declined 3.5% in total, but were widely varied on a grade-by-grade basis. Exports from New Zealand rose by 3.1%
- Domestic manufacturing increased in Australia, by a very strong 85 kt or 2.8%, driven by increased production of:
 - o Recycled containerboard materials at Orora's Botany mill and across Visy Industries' facilities
 - o Kraftliner at Visy's Tumut mill and Australian Paper's Maryvale mill
- In New Zealand, domestic manufacturing crept higher by 4.0 kt or 0.6%

- Domestic tissue manufacturers remained under pressure in Australia, with the total value of tissue stock imports rising 9.3%, even as average import prices jumped to record highs. Meanwhile, ABC Tissue increased its dominance of the Australian toilet tissue market. The industry awaits advice from ABC Tissue about the location of its third new machine, the substantial expansion plans being a potential game-changer for 2017
- Carter Holt Harvey Pulp, Paper & Packaging became Oji Fibre Solutions arising from its acquisition by Oji. In November 2016, Oji Fibre Solutions announced it would expand its box making in Australia, adding a Queensland corrugated box manufacturing facility to its established Melbourne and Sydney facilities
- The leading folding-box board converter, Colorpak, was acquired by Graphic Packaging International, increasing the globalised ownership of the Australasian industry's manufacturing and converting base
- Creation of a rationalised duopoly in the commercial print sector, with the PMP/IMPG merger followed shortly thereafter by the drawing together of Franklin Web and AIW within the IVE Group
- Imports into Australia of A4 White cut reams (copy paper) slumped dramatically, despite consumption only dropping modestly. Ongoing and intensifying trade disputes, especially the Anti-Dumping Commission's as yet unresolved case involving allegedly dumped copy paper from Brazil, China, Indonesia and Thailand, have possibly contributed to declining copy paper imports.

Details and more comprehensive analysis are included in the 2016 Pulp & Paper Strategic Review, published by IndustryEdge.

For further details go to www.industryedge.com.au





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2016 Overview



The 2016 Overview summarises the state of the industry and markets in Australia and New Zealand in 2016 and outlines the major market and industry events of the last year. The Overview includes key global production and consumption statistics and details the role of Australia and New Zealand in that global context.

Demand grew in Australia but declined slightly in New Zealand in 2015-16

The table summarises the Australasian pulp and paper industry to the middle of 2016.

Australasian Paper, Paperboard and Fibre Supplies to June 2016				
YE 30th June 2016	Australia		New Zealand	
		% Change on prior year		% Change on prior year
Number of pulp and paper facilities	14	-	7	-
Number of direct employees	12,450	-2.0	1,910	-
Pulp & Recovered Fibre				
Production of virgin fibre pulp (t)	1,473,000	+2.4	1,476,800	+3.0
Imports of pulp (t)	275,000	-5.5	47,471	-7.4
Exports of pulp (t)	-	-	976,600	+8.8
Exports of recovered paper (k)	1,421,800	-1.4	300,300	+4.1
Paper & Paper Board				
Production of paper & board (t)	3,123,000	+2.8	729,000	+0.6
Imports (t)	1,276,100	-4.3	412,700	+0.2
Exports (t)	1,146,700	-3.4	384,800	+0.4
Apparent consumption (t)	3,253,400	+2.2	756,900	-0.9

Source: IndustryEdge

Australia production, trade and demand details

For the year ended 30th June 2016, production, trade and consumption for each major grade of paper and paperboard is displayed in the following table.

Demand for Paper, Paperboard & Tissue in Australia by Main Grade: 2016 (tpa & % Change Over Last Decade)*										
YE June	Production		Exports		Local Sales		Imports		Apparent Consumption	
	t	% change	t	% change	t	% change	t	% change	t	% change
Newsprint	330,000	-2.1	63,300	42.0	266,700	-4.2	69,300	-14.4	336,000	-7.5
Printing & Communication	459,000	-2.5	128,000	-1.0	331,000	-3.0	773,200	-2.0	1,104,200	-2.3
Tissue	189,000	-1.2	20,200	-4.5	168,800	-0.8	112,100	7.1	280,900	1.6
Packaging & Industrial	2,145,000	1.6	935,200	3.8	1,210,800	0.1	321,500	2.6	1,532,300	0.6

Source: ABS & IndustryEdge research and estimates. *Full details for the last decade are supplied in the Newsprint section of IndustryEdge's 2016 edition of Pulp & Paper Strategic Review.

New Zealand production, trade and demand details

For the year ended 30th June 2016, production, trade and consumption for each major grade of paper and paperboard is displayed in the following table.

Demand For Paper, Paperboard & Tissue In New Zealand By Main Grade: 2015 (tpa & % Change Over Last Decade)*										
YE June	Production		Exports		Local Sales		Imports		Apparent Consumption	
	t	% Change	t	% Change	t	% Change	t	% Change	t	% Change
Newsprint	148,000	-8.6	44,800	-15.0	103,200	-2.7	11,200	7.6	114,400	-2.1
Printing & Communication	-	-	600	-8.1	-	-	168,200	-3.5	167,600	-3.4
Tissue	33,000	-1.7	800	-22.8	32,200	1.3	24,400	4.9	56,600	2.7
Packaging & Industrial	548,000	0.2	338,600	-0.8	209,400	1.9	208,900	0.5	418,300	1.2

Source: IndustryEdge research and estimates. *Full details for the last decade are supplied in the Newsprint section of IndustryEdge's 2016 edition of Pulp & Paper Strategic Review.

Domestic manufacturing industry operates in global context

The domestic paper, paperboard and fibre supplies sectors in Australia and New Zealand generally experienced stable operating conditions over 2016, compared with the previous few years.

In large part, this has been driven by reasonably stable currencies, with some depreciation, maintaining the competitiveness of domestically manufactured paper, paperboard and paper products. In the main, this is reflected in the earlier sections of Sixteen21, including the data tables. Driven by these factors and increased exports of food from Australia in particular, consumption of Packaging & Industrial grade papers rose strongly across fiscal 2016.

In late 2016, Oji Fibre Solutions announced it would build a third corrugating plant, in Queensland. The news comes amidst increasing imports of pre-converted corrugated boxes, along with other imports of finished packaging materials.

However, this demand improvement was not consistent across the grades. Demand and therefore consumption of newsprint and most grades of printing and communication papers remain in decline across the world, as well as in Australia and New Zealand as later sections of Sixteen21 demonstrate.

Excess global supply sees developed countries like Australia and New Zealand continually caught up in a cycle involving competition from ever-cheaper imports.

The depreciation of the Australian Dollar relative to the US Dollar since 2013 and its reasonable stability over 2016 has not been entirely good news for domestic paper producers. Imported pulp, chemicals and other materials are all more expensive, but manufacturers have no capacity to pass on costs to retailers or consumers.

For many grades of paper and paperboard, imports are continuing at high levels, despite the currency correction. This is a result of both global over-supply and the relatively high value of the Australian market.

For New Zealand, general economic strength has meant the NZ Dollar has remained stronger against both the Australian Dollar and the US Dollar. This impacts the still robust trans-Tasman trade, with a de-coupling of some supply lines between the two countries at least in part a symptom of a wider disaggregation of domestic industries in many sectors.

Increased integration with the Asian and global industries provide opportunities for Australian and New Zealand manufacturing, but also presents complex challenges. These require new and enhanced information, collaborations, skills and outlooks.

In addition, there are challenges for the domestic manufacturers, especially related to access to wood resources required for virgin pulp manufacture and on guaranteed access to gas and other energy resources. There are processes underway in Australia that stand reasonable prospects of a positive resolution, at least with respect to access to wood resources, on an ongoing basis.

The continuation of industry's investments, leave alone major new facility investments, remains dependent in large part upon the security of supply of wood resources (both hardwood and softwood) and energy resources.

Increased trade disputation impacts the Australian industry more than their New Zealand counterparts. Australia's anti-dumping system has been improved, but it remains difficult, expensive and time consuming to access fair trade mechanisms. Government support through procurement strategies remains sub-optimal, from an industry perspective.

Investments in the sector are generally smaller projects, primarily value-adding to existing processes, or in niches where competitive advantages are relatively assured.

The main exception, as was the case in 2015, is the significant investment in new tissue production capacity by ABC Tissue, targeting competition with imports of tissue products. New investments, by Oji Fibre Solutions, in corrugated box manufacturing in Australia, were also welcome, and an indicator of the packaging sector's growth prospects.

On an outlook basis, conditions are expected to remain relatively stable and slightly negative, across the industry and in both Australia and New Zealand throughout 2017 and 2018.

Global Market Context and Overview

In 2015-16, Australia & New Zealand combined consumed approximately 1.0% of global paper and paperboard, producing 1.6% of global pulp, exporting 3.0% of global recovered paper shipments and produced 0.8% of the world's paper and paperboard.

Global pulp production stable – 180.9 Mt in 2015.

The world's annual pulp production was estimated at 180.9 million tonnes in 2015, with North America accounting for 36% and Europe 25%. This is being challenged by Asia (22%),

which relies on both wood and non-wood pulp (made from bagasse, agricultural residues, grasses, etc.) as a significant input.

Global pulp production, by type, is included in the table on the next page for calendar year 2015, with a comparison to 2014.

Global recovered paper volumes grew modestly – 223.7 Mt in 2015.

IndustryEdge estimates recovered paper volumes at 223.7 million tonnes worldwide in 2015, with the regional split displayed in the table.

Asia is increasing its local recovery rates, but still imported a net 31.1 million tonnes of recovered paper in 2015.

As Asia increases its production of paper and board grades and reduces its use of non-wood pulps, it has increased its demand for recovered paper and is the key destination for recovered fibre. In 2015 it consumed 58.6% of global collections.

Australia and New Zealand combined recovered more than 3.7 million tonnes of paper and paperboard consumed in the two countries, and exported 1.8 million tonnes.

Global paper and paperboard production up slightly – 416.1 Mt in 2015

Global production of paper and paperboard was estimated at 416.1 million tonnes in 2015, up approximately 1 million tonnes on the year before. Asia produced 43% of the world's output, well ahead of North & Central America's 28% and Europe's 24%.

Growth in Asia remains widespread, including the installation of new capacity, most of it at a massive scale. Old paper machines continue to be retired, especially in China, where the government continues to mandate rounds of closures, on both environmental and efficiency grounds.

Global production of packaging boards (corrugating materials and cartonboards) and tissue papers continued to increase, but at a slowing 0.9% per annum, while communication grades are declining, especially newsprint (down a further 9.5%).

Closures of machines manufacturing printing and communication papers in Europe and North America are expected to continue, in line with the trend in demand. Until 2015, those closures had accelerated, but modest improvements in economic conditions provided a short-term reprieve for some facilities.

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Global Pulp Production by Type for 2014 and 2015 (Mt)*								
Pulp Production by Region	Chemical		Semi-Chemical/Mechanical		Non-Wood/Other Fibre		Total Pulp	
	2014	2015	2014	2015	2014	2015	2014	2015
North & Central America	51.6	51.2	13.9	14.1	0.4	0.4	65.9	65.7
Europe	31.1	31.6	12.6	12.6	1.4	1.8	45.1	45.6
Asia	25.5	25.1	4.9	4.8	10.5	9.8	40.9	39.7
South America	23.1	23.8	1.1	1.0	0.4	0.4	24.6	25.2
Africa & Middle East	1.1	1.1	0.6	0.6	0.2	0.2	1.9	1.9
Oceania	1.7	1.7	1.2	1.2	-	-	2.9	2.9
Total	134.1	134.5	34.3	34.3	13.0	12.1	181.4	180.9

Source: FAO and IndustryEdge* Calendar Year

Global Recovered Paper Volumes by Region for 2014 and 2015 (Mt)*								
Recovered Paper Volumes by Region	Recovery		Imports		Exports		Utilisation	
	2014	2015	2014	2015	2014	2015	2014	2015
North & Central America	52.7	53.6	3.0	3.1	22.0	22.7	33.5	34.0
Europe	57.7	57.7	14.5	14.5	22.9	23.6	49.3	48.6
Asia	100.0	99.9	37.6	39.5	8.4	8.4	129.2	131.0
South America	6.9	7.0	0.5	0.5	0.2	0.2	7.2	7.3
Africa & Middle East	1.8	1.9	0.1	0.1	0.2	0.2	1.7	1.8
Oceania	3.7	3.5	*	*	1.8	1.8	1.9	1.7
Total	222.6	223.7	55.8	57.8	55.6	56.9	216.8	224.4

Source: FAO & IndustryEdge * Calendar year

Global Paper & Paperboard Production by Main Grade: 2015 (Mt)# *					
	Newsprint	Printing/Communication	Tissue	P&I	Total
Africa & ME	0.2	0.7	0.3	2.1	3.3
North & Central America	5.3	18.4	8.8	84.2	116.7
Europe	8.4	30.8	8.2	52.7	100.1
Asia	10.0	48.3	12.9	106.2	177.4
South America	0.4	3.6	2.1	8.5	14.6
Oceania	0.5	0.5	0.3	2.7	4.0
Total	24.8	102.3	32.6	256.4	416.1

Source: FAO & IndustryEdge estimates # rounding and data error adjustments applied * Calendar year

Major Producing and Consuming Countries

Australia is generally ranked at around 20th in the world when it comes to total production and consumption of paper and paperboard. Though ranked lower in consumption terms, New Zealand is higher ranked in pulp production.

In 2015, China led the world in consumption of paper and paperboard at 109 million tonnes, and in production with 111.2 million tonnes. Both measures have increased by approximately 3% per annum since 2011. China produced 16.8 million tonnes per annum of pulp and imported a further 17.5 million tonnes. Recovered paper imports into China currently exceed 29 million tonnes per annum.

The USA was the largest pulp producer at 48.5 million tonnes in 2015.

Top 10 Pulp Producers and Australia & New Zealand: 2015 (mt & %)			Top 10 Paper & Paperboard Producers and Australia: 2015 (kt & %)			Top 10 Paper & Paperboard Consumers and Australia: 2015 (kt & %)		
Pulp Production	2015	% Change 2014	P&PB Production	2015 1,000 tonnes	% Change 2014	P&PB Consumption	2015 1,000 tonnes	% Change on 2014
1 USA	48.5	-1.2	1 China	111,200	2.2	1 China	109,00	2.8
2 Brazil	17.4	5.8	2 United States	72,400	-1.0	2 United States	70,300	-1.1
3 Canada	17.0	2.5	3 Japan	26,200	-1.5	3 Japan	28,400	-2.1
4 China	16.8	-4.0	4 Germany	22,600	0.3	4 Germany	26,500	-2.5
5 Sweden	11.1	0.9	5 India	15,000	3.3	5 India	20,100	-0.6
6 Finland	10.3	0.3	6 Korea, Republic of	11,600	-0.5	6 Italy	16,700	2.8
7 Japan	8.7	-2.8	7 Canada	10,600	-1.7	7 Korea, Republic of	10,400	2.5
8 Russia	8.0	4.9	8 Brazil	10,400	-0.4	8 Brazil	9,500	0.2
9 Indonesia	6.8	-	9 Finland	10,300	-0.8	9 United Kingdom	9,200	-6.3
10 Chile	5.1	-1.8	10 Sweden	10,200	-2.4	10 France	9,100	-1.9
19 New Zealand	1.4	-2.5	22 Australia	3,200	3.2	19 Australia	3,500	3.3
20 Australia	1.4	-						

Source: FAO

Note: Table revised 8/3/2017

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2021 Outlook

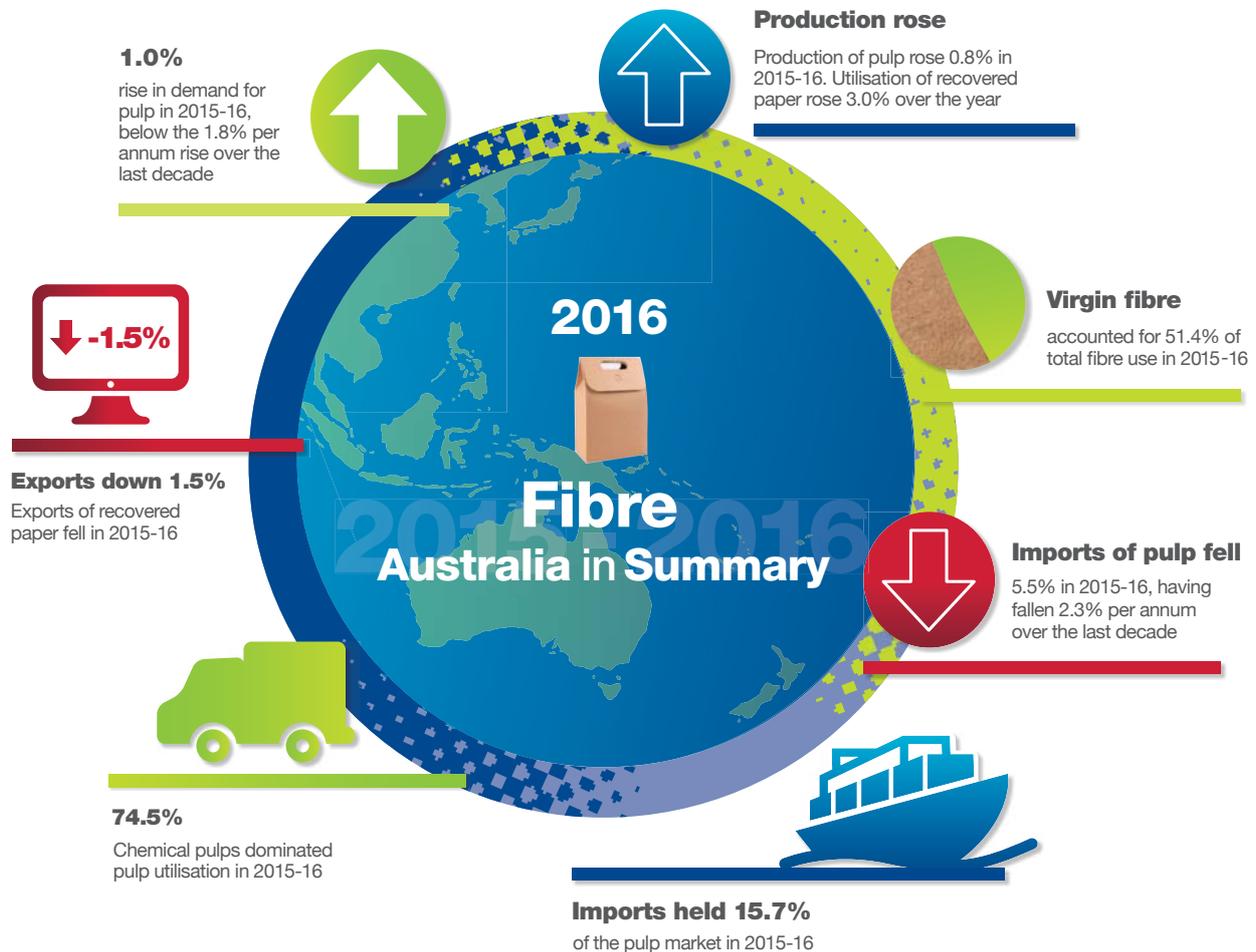
The 2021 Outlook provides an analytical window into the paper and paperboard industries and markets for both Australia and New Zealand, through to 2021.

It does so by detailing IndustryEdge's forecasts for demand for each of the major market segments and summarising the prior decade's production, trade and consumption for each country, along with relevant additional analysis.

Further detail is available from IndustryEdge at www.industryedge.com.au.



Sixteen21 Australia



Sources: IndustryEdge research & estimates, ABS, company reports

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Pulp, Recovered Paper and Fibre Resources

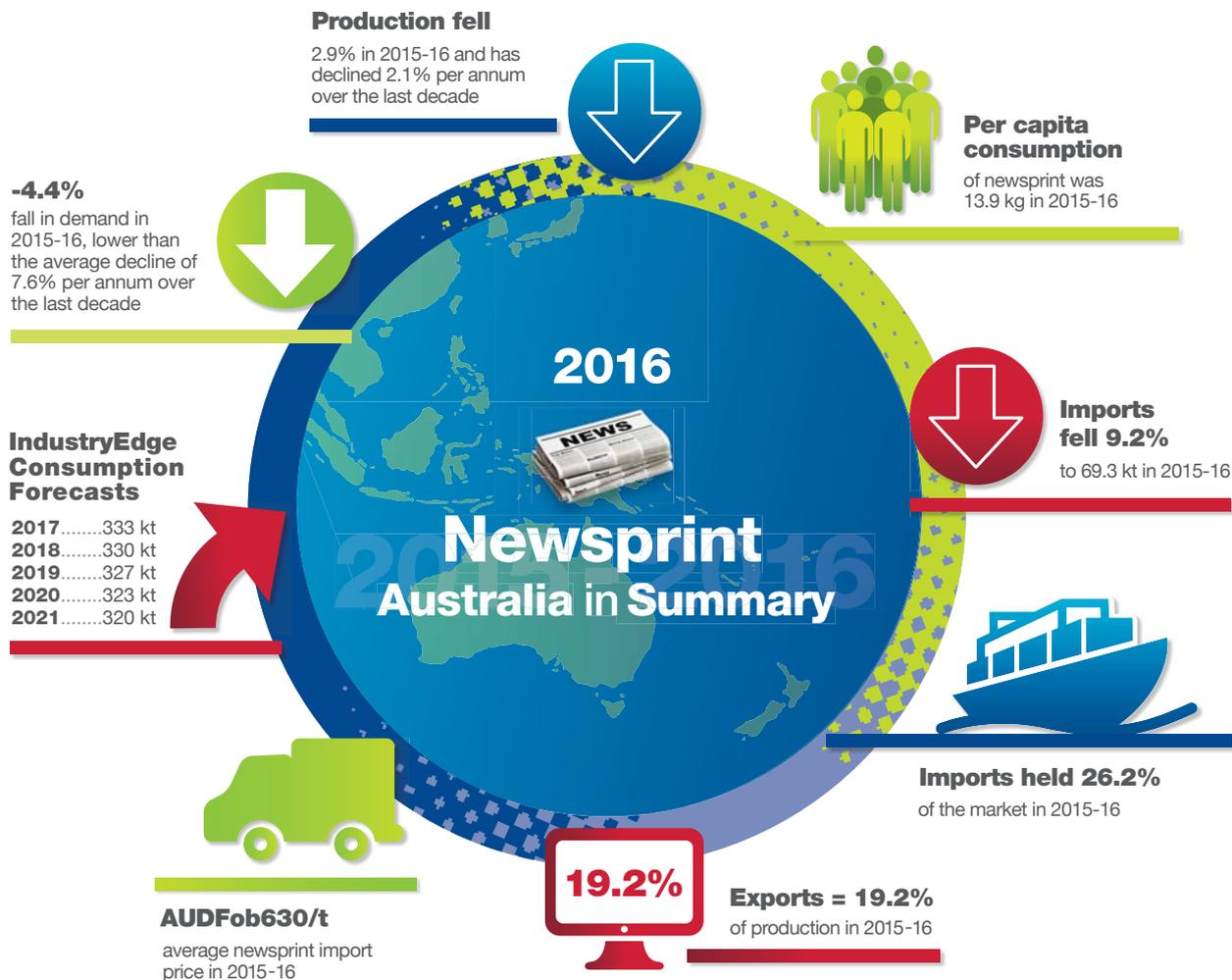
In 2015-16, Australia's consumption of pulp was 1,747,500 tonnes, a rise of 1.0% on the prior year and an average increase of 1.8% per annum over since 2005-06. Production was the highest on record for the second successive year, having grown at an average 2.8% per annum over the decade. Over the same decade, imports declined 2.3% per annum, with exports all but non-existent.

Focussed on self-sufficiency, Australia's pulp production is primarily chemical and largely Kraft based. Production is limited to just four mills in Australia: **Australian Paper's Maryvale mill, Norske Skog's Albury and Boyer mills** and **Visy Industries' Tumut mill**.

Recovered paper utilisation has grown an average 1.0% per annum over the same decade and totalled 1,656,000 tonnes in 2015-16. Recovered paper exports totalled 1,421,800 tonnes for the year.

Australia is entirely self-sufficient for wood resources to manufacture pulp, and additionally in 2015-16, exported 6.089 million bone dry metric tonnes of woodchips (primarily to China and Japan). Of this growing volume, almost 93% was hardwood chips, primarily from Australia's plantation resource base.

Sixteen21 Australia



Sources: IndustryEdge research & estimates, ABS, company reports

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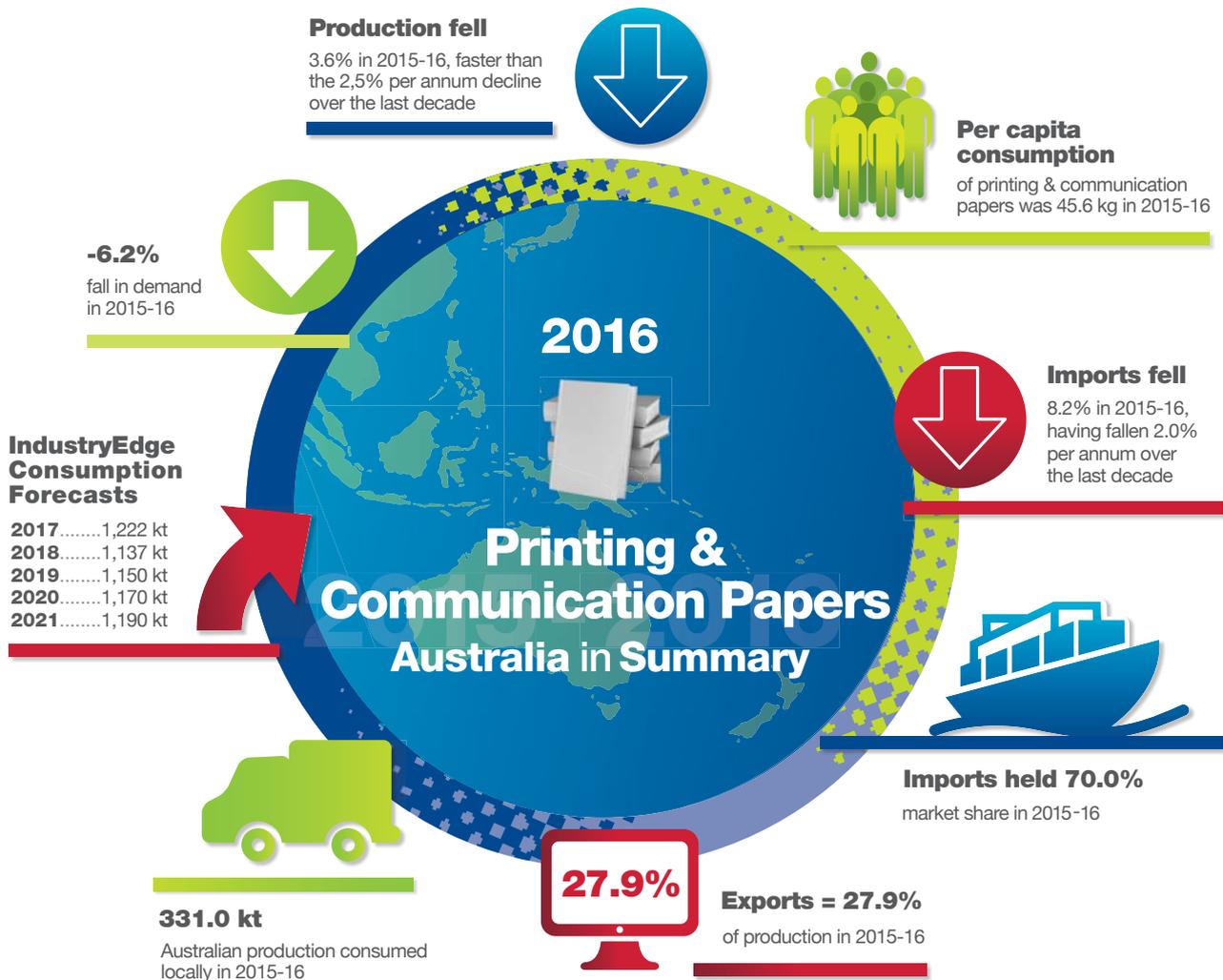
Newsprint

By any measure, the decline in demand for newsprint has been very dramatic over the last decade. Declining by an average 7.6% per annum, consumption of 336,000 tonnes in 2015-16 is significantly less than half what it was a decade before and will not recover.

Production, all of which is by Norske Skog, remained relatively stable for some years, but had declined to 330,000 tonnes by 2015-16, declining by 2.1% per annum since 2005-06. Conversely, imports have fallen an average 14.4% per annum over the same period.

IndustryEdge considers the decline in newsprint consumption will continue to be steep and will fall faster than outlined in the mathematical forecasts shown in the graphic above. Events that will drive consumption lower are likely to include publishers reducing the number of days they publish. On balance, IndustryEdge considers demand will be at or near 310,000 tonnes for the year ended June 2017.

Sixteen21 Australia



Sources: IndustryEdge research & estimates, ABS, company reports

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Printing & Communication Papers

Australian demand for Printing and Communication papers declined an average 2.3% per annum over the decade ended June 2016, falling to 1,104,200 tonnes. However, the single year decline in 2015-16 was a far steeper 6.2%. The mathematically derived forecasts above will unfortunately not be achieved.

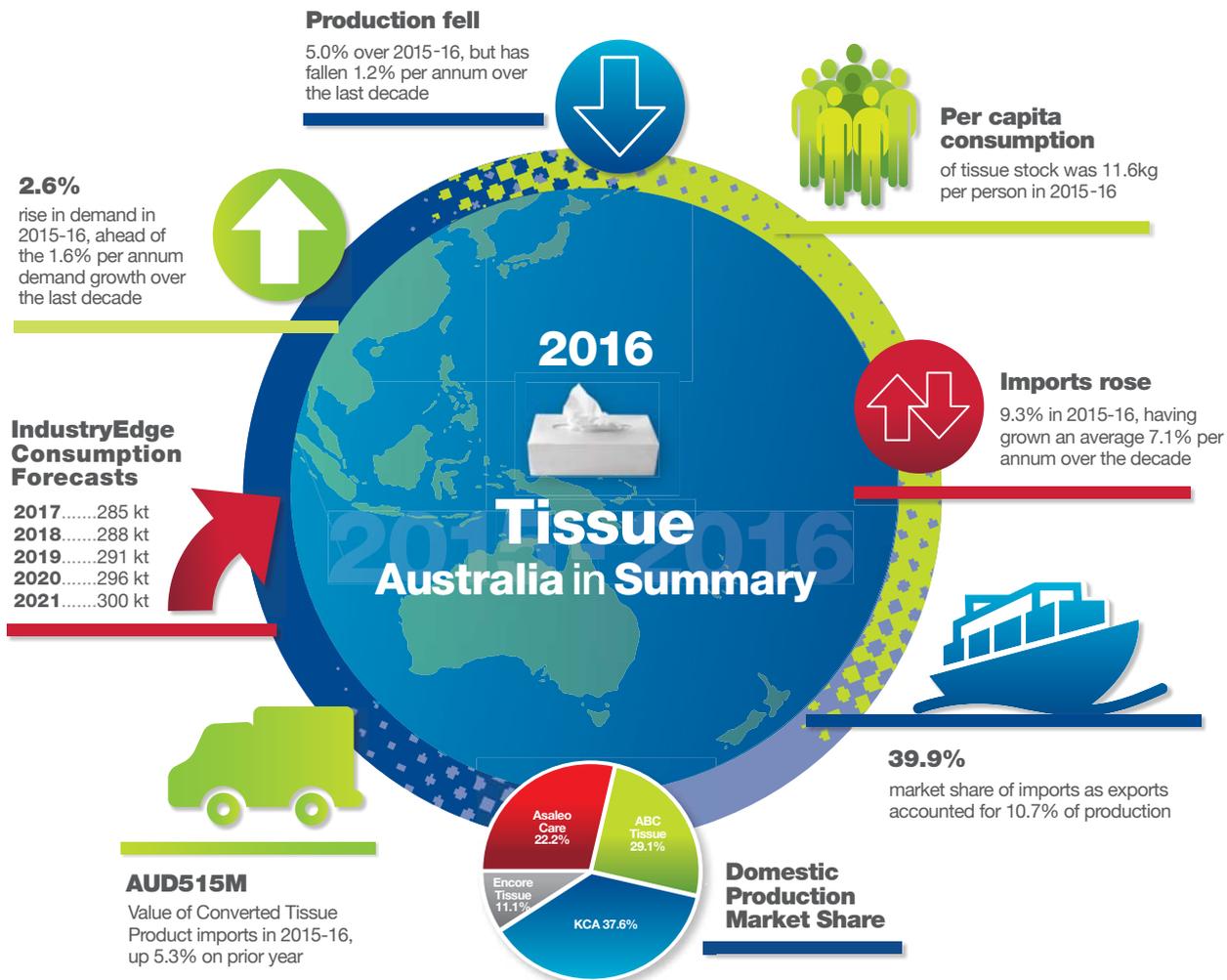
Intense and continuing pressure from digital communications and media has seen commercial printing decline, only to be replaced, to some extent, by increased office and home printing. Although declining, imports have remained relatively stable, declining by an average 2.0% per annum over the same decade.

Despite increasing due to the recommencement of Light-weight Coated mechanical paper production in 2014, total production

at year ended June 2016 was 459,000 tonnes, an average 2.5% per annum decline over the decade. Domestic manufacturers are Australian Paper and Norske Skog.

Demand for Coated Mechanical (CM) papers used in catalogues and magazines has grown an average 2.0% per annum, while the lower grade of Uncoated Mechanical (UCM) papers used in directories and lower grade advertising has declined 2.8%. Coated Woodfree (CWF) papers, used in general commercial printing, have declined by 5.5% per annum and the Uncoated Woodfree (UCWF) grade which includes copier and office printer paper, have declined 3.3%.

Sixteen21 Australia



Sources: IndustryEdge research & estimates, ABS, company reports

IndustryEdge

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Tissue and Tissue Products

Australia's tissue consumption has grown an average 1.6% per annum over the last decade, reaching 280,900 tonnes in 2015-16, amounting to 11.6 kg per person. Over the same decade, production has declined an average 1.2% per annum, while imports have doubled over the same period and totalled 112,100 tonnes in 2015-16.

Australian capacity utilisation slumped to 70%, as anticipated, in 2016, and is likely to fall again in 2017. This occurred as a result of ABC Tissue installing approximately 85,000 tonnes of new capacity. This could cause capacity utilisation to fall as low as 61%, creating serious implications for other manufacturers and for importers.

Tissue Manufacturing Capacity Utilisation in Australia: 2005 – 2015 (ktpa & %)

Y/E June	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Estimated Capacity (ktpa)	255	285	260	260	260	260	235	235	235	240	269
Estimated Production (ktpa)	214	220	215	220	200	180	175	151	185	199	189
Estimated Capacity Utilisation (%)	84	77	83	85	77	69	74	74	79	83	70

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Sources: IndustryEdge research & estimates, ABS, company reports

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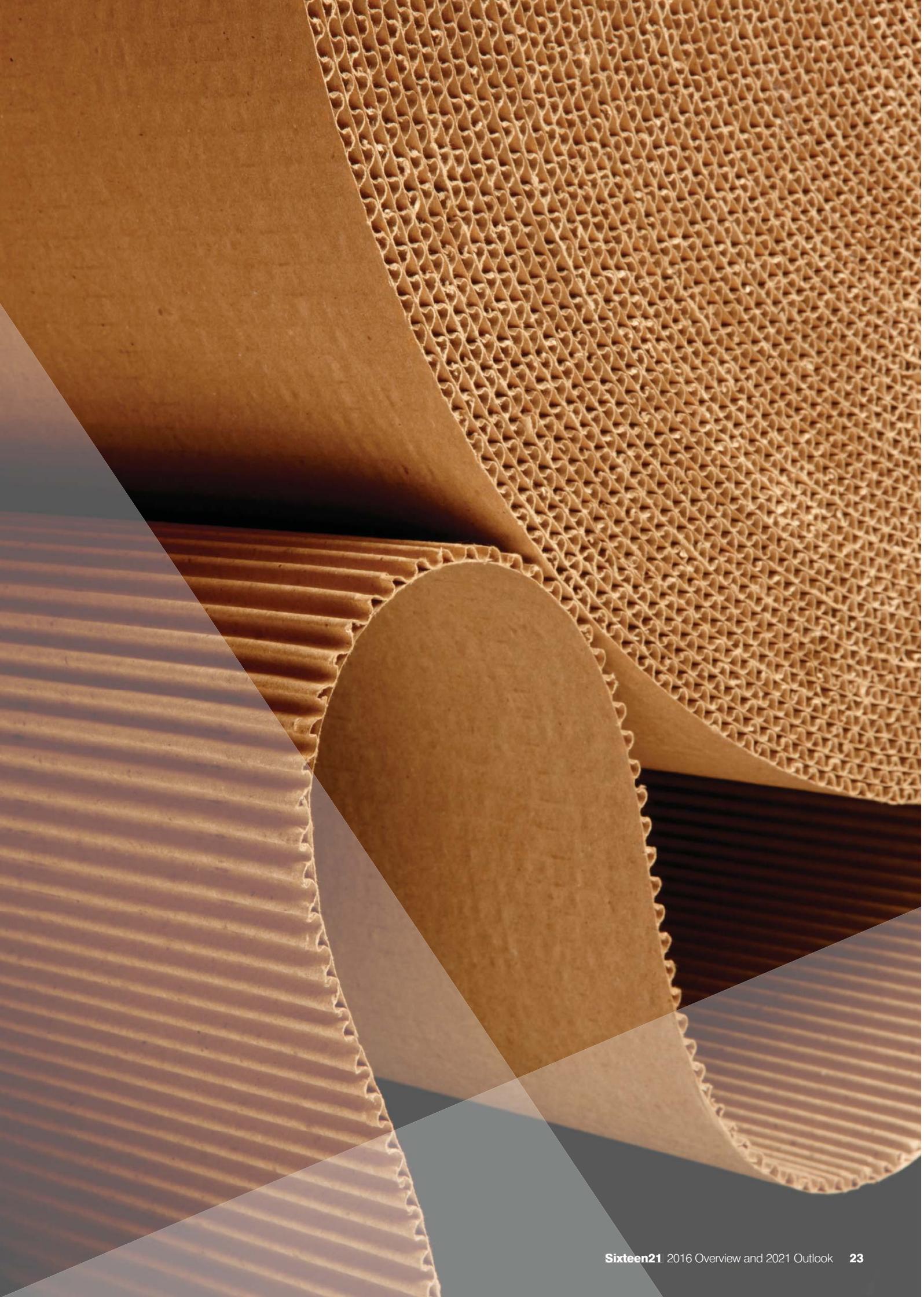
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Packaging & Industrial Paper & Paperboard

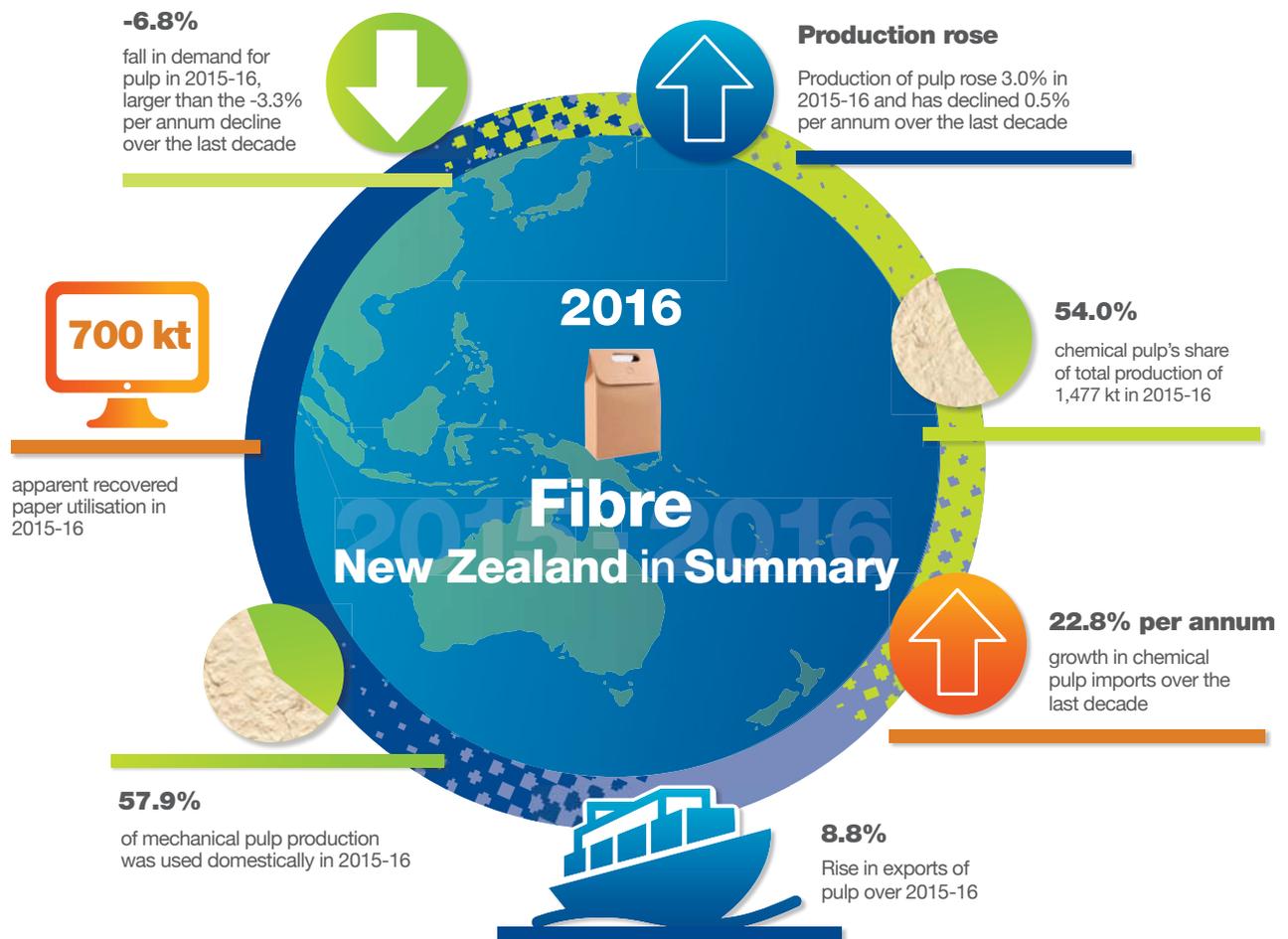
Measured by weight, Australia's consumption of packaging and industrial papers grew at a modest 0.6% per annum to the end of 2015-16. However, strategies such as 'light-weighting' of packaging materials and large volumes of imports of pre-converted packaging mean there has been faster growth in the consumption of fibre based packaging materials.

Exports, almost all of which are containerboard materials, have grown at a solid 3.9% per annum, underscoring the importance of the region's softwood fibre resources for Asia's packaging markets.

Australia's pre-converted packaging imports totalled 104,500 tonnes in 2015-16, amounting to approximately 6% of total consumption. Although consumption growth is forecast by IndustryEdge to be relatively modest from 2016 to 2021, the sector is in many respects the strongest for the Australian industry.



Sixteen21 New Zealand



Sources: IndustryEdge research & estimates, ABS, company reports

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Pulp & Recovered Fibre

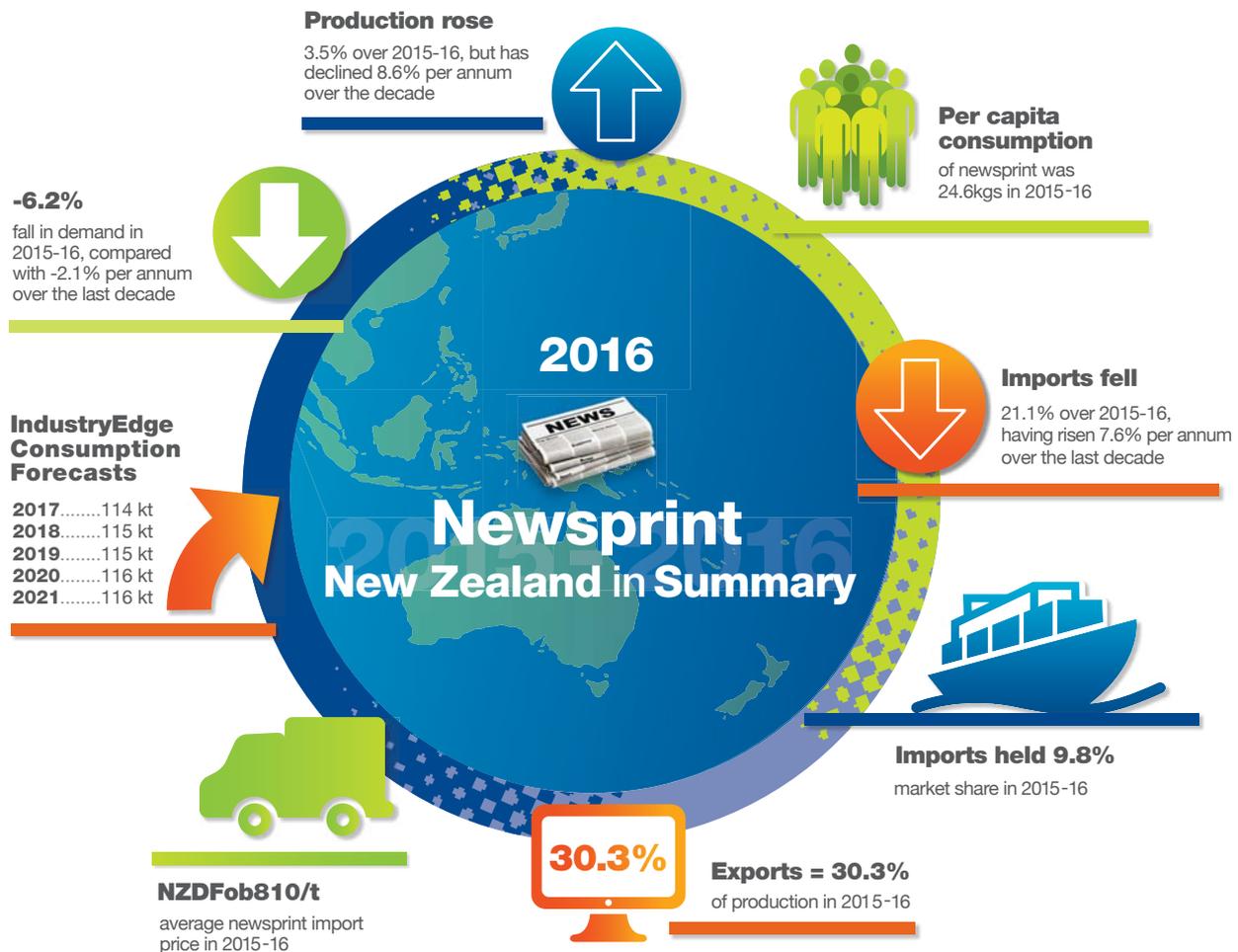
New Zealand's consumption of wood pulp has declined at an average rate of 3.3% per annum over the last decade, totalling less than 600,000 tonnes in 2015-16. Production has fallen an average 0.5% per annum over the same period, but totalled 1,476,800 tonnes in 2015-16.

Imports totalled 47,500 tonnes for the year, while exports set a new record of 976,700 tonnes, accounting for almost two-thirds of production.

Of its pulp exports, which grew a significant 8.8% in 2015-16, more than 690,800 tonnes was chemical pulp and 285,800 tonnes was mechanical pulp.

New Zealand's pulp exports make a significant contribution to Asia's fibre supplies, especially for the manufacture of packaging paper & paperboard.

Sixteen21 New Zealand



Sources: IndustryEdge research & estimates, ABS, company reports

IndustryEdge

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Newsprint

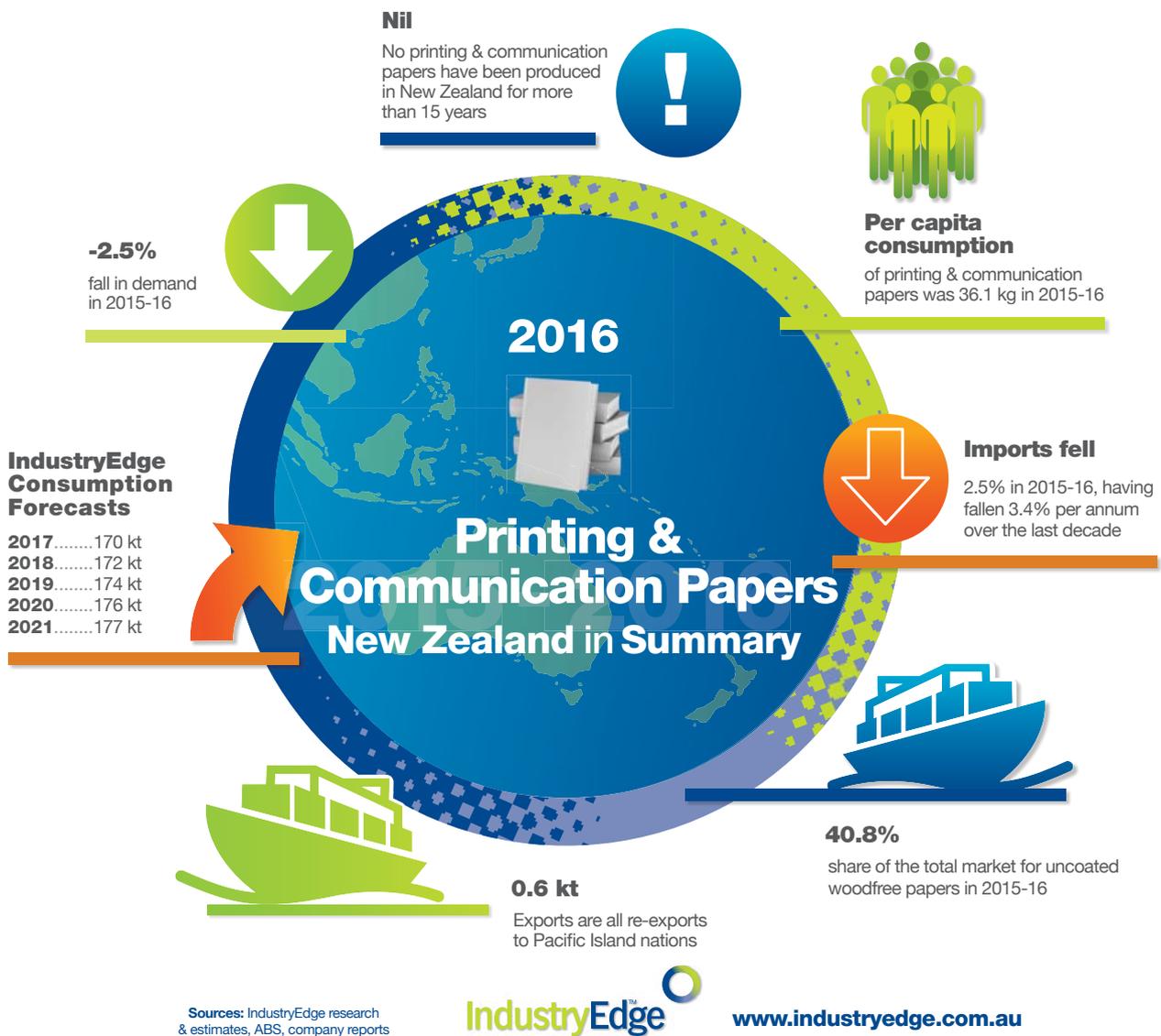
Despite faring better than Australia (and most economically developed nations), demand for newsprint in New Zealand has declined an average 2.1% per annum over the decade to 2015-16, falling to a low of 114,400 tonnes for the year. Demand declined 6.2% for the year, indicating an acceleration in the pace of consumption decline.

The sole domestic manufacturer, Norske Skog, produced an estimated 148,000 tonnes of newsprint, exporting 44,800 tonnes, with imports totalling 11,200 tonnes.

More than half of the imports are delivered from Norske Skog's other operations in Australia.

New Zealand's slower than average consumption decline appears to be a result of discreet media markets, in which strong regional newspapers are a more significant presence than in other countries, including Australia.

Sixteen21 New Zealand



Printing & Communication Papers

New Zealand's total consumption of printing & communication papers declined an average 3.2% per annum over the decade ended 2015-16, but has been more stable over the last five years. Demand totalled 168,200 tonnes in 2015-16.

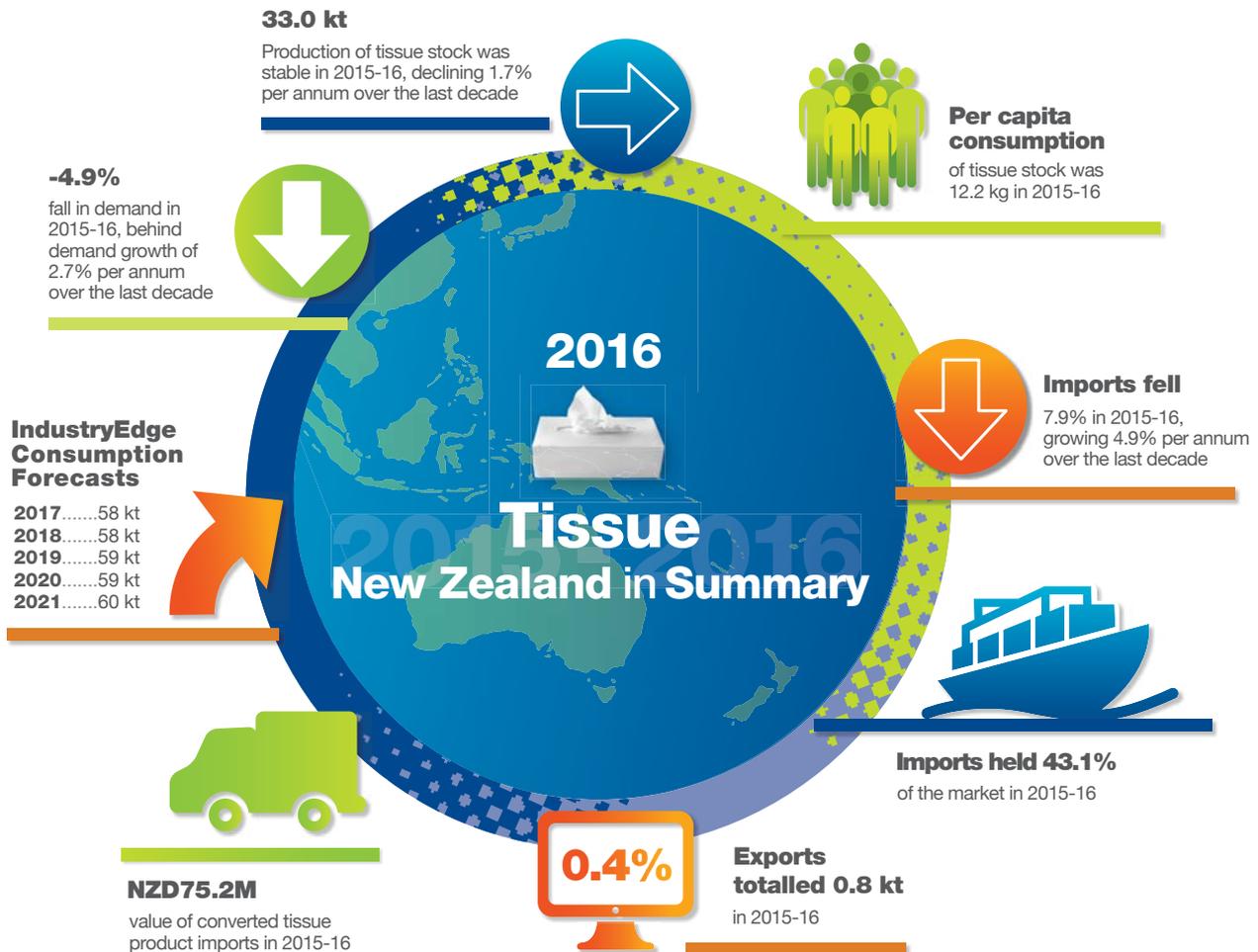
Commercial printing in New Zealand is a relatively small sector compared with Australia, dominated by just a few larger printers and a small cohort of paper merchants.

New Zealand's entire consumption of printing & communication papers is supplied by imports, including from Australia.

The main grades have had different average demand experiences over the last decade:

- Uncoated Mechanical (UCM) declined 14.5% per annum
- Coated Mechanical (CM) grew 3.4% per annum
- Uncoated Woodfree (UCWF) declined 3.2% per annum
- Coated Woodfree (CWF) declined 6.6% per annum.

Sixteen21 New Zealand



Sources: IndustryEdge research & estimates, ABS, company reports

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Tissue & Tissue Products

Consumption of tissue in New Zealand has grown at 2.7% per annum over the decade, but declined in 2015-16, by 4.9%, after a record the prior year. Per capita consumption amounted to 12.2 kg of tissue stock, per person, per year in 2015-16.

Production, all of it by Asaleo Care, totalled 33,000 tonnes for the year, with exports all but non-existent. Imports of tissue

stock held more than 43% of the market in 2015-16, while the value of imports of converted tissue products reached NZD75.2 million for the year, returning to growth after several years in which they struggled due to New Zealand's high exchange rate.

The longer-term prognosis for tissue production in New Zealand is stable.

Sixteen21 New Zealand



Sources: IndustryEdge research & estimates, ABS, company reports

IndustryEdge

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Packaging & Industrial Paper & Paperboard

New Zealand's packaging & industrial paper sector is necessarily export focussed, with almost 62% of the 548,000 tonnes of production being exported in 2015-16. Demand has grown an average 1.2% per annum over the decade, grew 2.7% in 2015-16 and totalled 418,300 tonnes in 2015-16.

In addition to exports of packaging papers for use overseas, New Zealand's packaging papers are also exported as packaging around the country's large and growing food exports.

Despite the strong export focus, imports still accounted for almost half of total demand. Australia supplied 89.2% of imports of packaging and industrial papers.

In New Zealand, driven by food packaging requirements, export markets and the unavailability of larger volumes of recovered fibre, packaging and industrial paper production is dominated by virgin fibre and Kraftliner in particular. In 2015-16, Kraftliner accounted for almost 60% of total production and just over half of total exports.

New Zealand's packaging and industrial paper sector is a significant industry, with the added advantage of being tightly integrated into the national food production industry and both domestic and export markets.



Challenges & Opportunities for the Australasian Industry

Situational Analysis for Australia's Pulp & Paper Industry

Paper and paperboard is a mature sector of the Australian economy. Demand and consumption are lagging considerably behind growth in the domestic economy. The domestic production industry's virtues are the steadiness of demand, the relative price stability it experiences despite a fluctuating international pulp price, and the country's stable political and economic environment.

Of the main sectors, limited growth in demand for printing and communication papers is being met by expanded domestic production, as well as imports, with newsprint demand continuing to decline.

Packaging paper and paperboard production capacity has increased over the past decade, with exports accounting for almost 44% of production. Domestic demand is modestly positive.

Apparent consumption for tissue remains relatively unimpaired by economic cycles, however the domestic sector is challenged by importers and the strategy of major retailers.

Key elements of the industry's outlook are:

Australia's Low Sovereign Risk

Australia is a politically stable, robust democracy. In economic terms it has confronted the issues of economic rationalisation, reform and globalisation and, under normal economic conditions, demonstrates growth rates, bank liquidity and employment levels that contribute to a stable investment environment and low sovereign risk.

Abundant Primary Fibre Resources

Although a dry continent, Australia's fibre resources are abundant, relative to population. The Australian native wood resource is almost entirely made up of hardwoods of various species. Access to this resource remains under community and legislative pressure.

Australia has a very large volume of hardwood pulpwood available, the vast majority of which is exported. A relatively small quantity is manufactured into bleached hardwood kraft pulp. (Australian Paper - Maryvale mill) All of this pulp is used internally.

Australia's softwood resource is substantial, providing the majority of Australia's pulpwood. Additional volumes are exported. Softwood pulping includes mechanical pulping (Norske Skog - Albury mill & Boyer mill) and chemical pulping. (Visy - Tumut mill, Australian Paper - Maryvale mill)

Secondary Fibre

In 2015-16, Australia exported 1.42 million tonnes of recovered paper and paperboard, compared with its consumption of 3.2 million tonnes of pulp and recovered fibre. Most Asian economies rely on imports of secondary fibre, and having a substantial resource available locally is of definite strategic advantage for Australia. Recovery and implied recycling rates are stable at approximately 77% of relevant consumption.

Geographic Isolation

Apart from the formal protection historically afforded the industry, a strategic strength has been its isolation. A combination of freight costs, some tariffs and shipping times traditionally protected the industry but all are now reducing the positive impact of geographic isolation for the Australian industry.

Access to Energy Resources

Australia has abundant reserves of both coal and gas, providing power for high energy consuming forms of production. Future generating capacity is in step with potential demand and industrial energy demand has declined in recent years, with further decreases expected as industrial energy efficiency improves. With much of Asia either short of generating capacity and/or dependent on oil for electricity, Australia is in a position to redress at least part of the cost inequalities brought

about by Asia's generally lower cost structures. However, the future of gas policy and guarantees of access to Australia's gas resources is a major issue for Australian manufacturing industries.

Ageing Production Base for Printing & Communication Papers

Prior to the conversion of a newsprint machine in Tasmania, (Norske Skog – Boyer mill) to manufacture light-weight coated mechanical papers, the newest of the small manufacturing base of the Australian printing and communication paper sector was built in 2005. (Australian Paper – Maryvale mill) All machines are below scale and total capacity is limited.

Similarly, the most recent newsprint machine dates from the early 1980s and although it was upgraded in 2006, with respect to width and speed, it lags behind modern world scale. (Norske Skog – Albury mill)

Market Size vs. Machine Size

Because Australia has a relatively small population, the local market is not large. What constitutes a world scale production facility in each of the three main sectors; printing and communication papers, packaging and industrial papers and boards and tissue, varies considerably. World scale in printing and communication paper machines is now around a half million tonnes (with one million tonne per annum machines now being operated in China) and in packaging it is not much different. In tissue, however, it would be possible to fit four world scale machines into the local market. The tissue sector represents the market in which scale is not a particular issue.

Local Market Orientation

Consistent with its geographic isolation, the industry developed capacity and strategies to supply domestic markets. Led first by Visy Industries and followed by Orora and Australian Paper, the industry's profile has, by necessity, become more outward looking.

The newsprint and tissue sectors may be forced to follow suit as manufacturers find it difficult to fully utilise new capacity in the local market. One manufacturer is implementing a major investment strategy to compete with imports. (ABC Tissue)

Pulp

In 2015-16, Australia exported 6.089 million bone dry metric tonnes of hardwood and softwood chips to manufacture pulp. This is equivalent to approximately 12.200 million tonnes of green wood. In the same year, Australia imported 0.275 million tonnes of pulp.

Possibly the major opportunity for the development of the pulp and paper industry in Australia is to manufacture and export pulp, and at the same time, reduce reliance on imported

pulps. There are strong influences working against such a development, including the existing very strong markets for Australian hardwood chips in China, Japan and elsewhere in Asia.

India in particular, shows prospects of being a larger market than China, and has almost no industrial forests. With its population growing faster, coupled with its technological orientation, a deregulated Indian economy has the potential to develop an even greater appetite for printing and communication papers than China.

Although it seems like sending coal to Newcastle, there are also opportunities in Indonesia, as fibre supply is increasingly stressed by competing land uses.

Domestic pulp utilisation will rise, with the entire Australian tissue products market supplied by imported pulp. (ABC Tissue, Asaleo Care, Encore Tissue, Kimberly- Clark Australia)

Paper

Undeniably limited, opportunity exists to produce printing and communication papers for import replacement (for example, Coated Woodfree grades of paper), especially if Australia and New Zealand are regarded as a single market. It is this opportunity that was taken up with the conversion of a newsprint machine to the production of light-weight coated mechanical grade papers. (Norske Skog – Boyer Mill)

Import replacement opportunities also exist for cartonboard (folding box-board) supply and for a range of pre-converted fibre packaging materials and for tissue products, especially those that are imported in pre-converted form.

Price Deflation

The major threat to paper producers and their suppliers, in real terms, is price deflation. The cause, for much of the last several years, has been the appreciation of the Australian dollar – which made imported stocks cheaper in the local market. When the value of the Australian Dollar depreciated from mid-2014, the supply and demand imbalances were large enough that prices did not fully recover.

World oversupply, especially of Printing & Communication papers, has also been a factor, with increasing supply chasing diminishing demand.

Printing Industry Rationalisation

For many years, the printing industry in Australia has been characterised by its small-scale, low to mid-level technical capability and sophistication, disaggregation and at times, significant over-supply. As demand for printed material declines, the situation has become more pronounced. This situation is slowly resolving itself as competitive pressures cause more marginal participants to cease operating.

Rationalisation continued into 2016, with five major commercial printers merging into two more substantial, national printing groups. *

* pending regulatory approval

Environmental

Pulp

A continuing strategic threat to the industry and its expansion prospects is ongoing opposition – purportedly on environmental grounds – to the domestic manufacture of pulp and paper products. This applies especially to major capital investments such as pulp mills.

Paper

Paper is heavy and bulky and some quantities are still being deposited in landfills, even though that practice is diminishing. Australia has been very successful in recycling high volume, low value grades such as newsprint and packaging paper and paperboard, recovery of both hovers just below 80% of consumption.

Situational Analysis for New Zealand's Pulp & Paper Industry

More so than is the case for Australia, New Zealand's economic fortunes are dictated by its small population and markets, despite its relatively abundant natural resources.

The long-term emphasis on supply to the Australian market is gradually being decoupled as both economies come to grips with the full impact of a truly globalised pulp and paper industry and increasing levels of international ownership.

New Zealand's pulp and paper manufacturers – overall – appear to be marginally more nimble than their Australian counterparts. This is a function of its smaller scale and potentially greater vulnerability.

It is the abundance of natural resources that provides the opportunities for New Zealand in the future.

New Zealand Enjoys Low Sovereign Risk

New Zealand is politically stable. In economic terms, it was once of the global leaders of economic rationalization, but more recently has become a gradually higher-cost economy, with a significant reputation for environmental sustainability and food security. As a destination for international investment, it is regarded as having a very low sovereign risk.

The volume of high-end office papers claimed by the recycling process is lower. Much of this unrecovered material is retained in office archives and files. The industry has only recently begun to contribute significantly to collection and recycling of these papers. One deinking facility (Australian Paper – Maryvale mill) absorbs 80,000 tonnes per year of recovered printing and communication grade papers, from which recycled office and copy papers are manufactured.

Free Trade

Australia has signed free trade agreements with the USA, ASEAN, Korea, China and Japan. There is significant threat in these agreements, at least for paper and paperboard manufacturers (as opposed to importers). This is because the agreements have eliminated duties of at least 5%, in the case of China with no reciprocal rights, and anti-dumping actions will become more difficult to pursue.

There is little to fear from the high-cost and relatively inefficient paper industry in the USA, but the agreements with China and the ASEAN nations have serious consequences for paper and paperboard manufacturers in Australia. This is especially so as the Chinese manufacturing base has expanded ahead of domestic demand and the surplus is being tipped at an alarming and often very cheap price, onto the international market.

Expertise, Market Knowledge & Reputation

New Zealand has been manufacturing and exporting pulp, newsprint and packaging materials for a very long time and has substantial expertise, market knowledge and international reputation in the industry. Its expertise in Asian packaging markets is particularly well considered.

Plantation Base

Pulp in New Zealand is almost entirely derived from a softwood plantation resource. As a result, it escapes much of the conflict of many other Asian manufacturers, as well as those experienced by Australia. A very significant quantity of softwood log exports from New Zealand has been recorded over the last decade or more, and is continuing, despite some concerns about the exports denuding the domestic manufacturers of their future resource. The significance of the Radiata pine resource for the manufacture of virgin kraft pulp cannot be under-estimated in New Zealand.

Multi-National Ownership

Almost all of New Zealand's pulp and paper manufacturing assets are owned by multi-national corporations, allowing them to leverage technology and market development

opportunities across the globe, and in particular in Asia. Global corporations with significant exposure include the Oji Group (Oji Fibre Solutions and Pan Pac) in pulp and packaging, Norske Skog in newsprint and SIG Comblibloc in liquid packaging.

Necessarily Export-Oriented

The New Zealand industry's main products are pulp, newsprint and packaging materials. It has a reasonable home market for packaging (much of which is exported as packaging for food products), but with a small domestic market available for amortising fixed costs, it has been disadvantaged in world markets.

Although it had found it difficult to make inroads into the Australian packaging conversion market (corrugated boxes) in late 2016, Oji Fibre Solutions announced the construction of a third corrugated box manufacturing plant in Australia. This, its third facility, adds to its exports of packaging materials to the lower value, but larger and stronger markets of Asia.

Ownership of the Whakatane cartonboard mill by SIG Comblibloc has resulted in that business being integrated into the global cartonboard and liquid packaging board markets, with exports increasing and being supplied to a wider range of countries.

Small Secondary Fibre Resource

Secondary fibre is relatively cheap fibre – more so in a country where power costs are high. With a small recovered paper resource, New Zealand must sustain its industry largely on virgin fibre.

Fragmented Resource Base

While it has a sizeable softwood plantation base, apart from the Central North Island (CNI), much of it is geographically fragmented with little opportunity of establishing the critical mass required to sustain new, world scale production facilities.

In the CNI, there is a pulpwood shortage and, given that the resource is sawlog driven, there is little capacity for expansion. There is, therefore, little opportunity to increase scale to reduce costs. Pulpwood consuming reconstituted building products, such as MDF and particleboard, require less resource to sustain world scale facilities and are in a good position to dominate both the CNI and the non-CNI resource parcels.

High Cost Power

New Zealand's difficulties are compounded by the fact that most of its hydroelectricity is generated in the South Island, leading to high transmission losses to the manufacturing centre in the Central North Island (CNI). A lack of strategic planning following privatisation of the power industry has resulted in rising energy prices. Several pulp and paper facilities have access to geo-thermal power fields, providing them with a natural hedge against rising energy prices. Energy costs

are particularly potent in relation to Bleached Chemi-Thermo Mechanical Pulp (BCTMP) pulp and newsprint production, where the main pulp source requires abundant mechanical (as opposed to chemical) energy.

High Freight Costs

New Zealand's main market for its pulp, paper (mainly newsprint) and packaging paper and paperboard is Australia, and in this respect it suffers from the high cost of sea freight on low utilisation routes. That aside, freight costs from Australia to New Zealand are higher than the other way, providing a buffer for the New Zealand industry.

International Competition

The main threat to New Zealand's exporting pulp sector is competition from South America whose abundant resource, world scale production facilities and low local cost base make it a potent competitor in commodity grades of paper. The exploitation of Russia's vast Siberian natural softwood forest resource and the common border it has with the main Asian market, China, also constitute a considerable threat, but one that may be ameliorated in time as the Russian industry's costs inevitably increase.



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Sources

In addition to IndustryEdge research, forecasts and estimates, the content of Sixteen21 was informed by the following sources.

Australian Bureau of Resource Economic & Statistics (ABARES): **www.agriculture.gov.au/abares**

Australian Bureau of Statistics (ABS): **www.abs.gov.au**

UN Food & Agriculture Organisation (FAO): **www.fao.org**

Reserve Bank of Australia (RBA): **www.rba.gov.au**

Reserve Bank of New Zealand (RBNZ): **www.rbnz.govt.nz**

Statistics NZ: **www.stats.govt.nz**

IndustryEdge's ongoing research program includes continuous industry interviews in Australia and New Zealand and elsewhere around the world, as well as comprehensive analysis of production, trade and other relevant data, company annual reports and media reporting.

Supporting Associations



Founded in 1967, **Korea TAPPI** has grown into the Korea's unique professional association serving the pulp, paper, and other related industries. Korea TAPPI contributes for the development of the technologies associated with the pulp and paper industries and promotes to share the knowledge and information through annual conference, seminars, exhibitions, educational programs, and publications.

www.ktappi.or.kr



TAPPSA covers the entire process chain from timber plantations to converted paper products. By furthering the application of science and technology in pulp, paper and allied industries, it provides a forum for idea generation, encourage education in pulp and paper manufacture use, stimulate investigation and stimulate research into the manufacture and use of pulp and paper.

www.tappsa.co.za



WPMA advocates on behalf of a broad membership spanning the whole wood supply chain post forest gate.

WPMA represents one of New Zealand's biggest manufacturing sectors. Our sector epitomises the low carbon/high value economy with Members turn a commodity – logs – into high value, end-products marketed in New Zealand and globally.

www.wpma.org.nz



TAPPI is a not for profit, volunteer-led association that is built around a community comprised of thousands of member engineers, managers, scientists, academics, suppliers and others from around the world. We foster the vitality of the global forest products, pulp, paper, tissue, packaging, and associated industries by delivering unsurpassed technical knowledge, valuable networks, and professional growth for our members.

www.tappi.org



ForestWorks is an industry owned not-for-profit organisation offering services to support the skills development of the forest, wood, paper, timber and furnishing industries. Two key services that ForestWorks offers industry include the FOLS Skills Verification Program and the Forestry Better Business Program. ForestWorks' mission is to build the success of the entire industry by developing the capabilities and strengths of its people.

www.forestworks.com.au



The Australian Forest Products Association (AFPA) is the peak national body for Australia's forest, wood and paper products industry. We represent the industry's interests to governments, the general public and other stakeholders on the sustainable development and use of Australia's forest, wood and paper products.

www.ausfpa.com.au

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Rani Smale Design

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IndustryEdge Pty Ltd

PO Box 7596
4/115 Pakington St Geelong West,
VIC, 3218 Australia

Tel: +61 (0) 3 5229 2470

Fax: +61 (0) 3 5229 0034

Email: info@industryedge.com.au

Appita Inc

PO Box 816
Macleod VIC, 3085
Australia

Tel: +61 (0) 3 467 9722

Fax: +61 (0) 3 467 9778

Email: admin@appita.com