Rubicon

Pure play, clear focus

Initiation of coverage

Basic materials

The simplified corporate structure presents investors in Rubicon (RBC) with a pure-play, advanced forestry genetics business with leading positions in large international markets for its seedlings. The conversion of these positions into profitable growth through customer migration to more advanced seedlings is the likely driver of further share price outperformance in our view. Our own DCF analysis – implicitly more conservative than the company's – yields a NZ$0.74 per share valuation.

Year end	Revenue (US$m)	EBITDA – US GAAP (US$m)	PBT* (US$m)	EPS* (c)	P/E (x)	EV/EBITDA (x)
03/18**	35	6	4	1.2	14.5	16.2
03/19e	51	5	5	1.1	15.8	21.5
03/20e	59	9	10	2.0	8.9	11.9

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles and exceptional items. **Six-month trading period only.

Corporate actions simplify the investment case

Rubicon acquired its partners' interests in ArborGen, a longstanding JV, in 2017, to take full control of this internationally established business. Having exited its other investment (in Tenon) in the same year and returned cash to shareholders, Rubicon is now solely focused on further developing ArborGen's integrated advanced seedling operations in its core territories of the US, Brazil and Australasia. We believe Rubicon is positioned to self-fund its growth from here and we expect to see net debt trending down from FY20.

Well positioned in growing markets

The economic growth outlook in each of those core countries is either good or improving, according to OECD data. Consequently, the primary end-markets served by its plantation forestry customer base (being construction, and the pulp and paper industries) are in a positive cyclical phase. We believe this should bode well for the returns to ArborGen's plantation forestry customer base and reinvestment activity through re-planting. Advanced genetics seedlings deliver enhanced productivity (in terms of tree volume growth, form and disease resistance) compared to traditional open pollination seedlings. Ongoing migration to these higher-value offerings is the foundation for ArborGen's growth and Rubicon's investment case. At the same time, given market-leading positions – with effective entry barriers – ArborGen is expected to increase market share and grow volumes ahead of underlying markets.

Valuation: Value to emerge

Over the last 12 months, Rubicon's share price has travelled well and at NZ$0.27 is up c 29%. Given the corporate transformation, some recognition of the company's improved prospects is entirely appropriate and we believe there is more to come as ArborGen's underlying financial performance becomes more visible. For now, the P&L is relatively immature; this is reflected in the current year P/E and EV/EBITDA (US GAAP) of 15.8x and 21.5x, which reduce to 7.1x and 8.9x on our estimates by FY21. Our own DCF-based analysis indicates a core gross equity value for Rubicon of U$240m (or NZ$0.74 per RBC share), before adjusting for outstanding warrants and options.

9 September 2018

Price	**NZ$0.27**
Market cap	**NZ$132m**
	NZ$/US$ 0.66
Net debt (U$m) at end March 2018	10
Shares in issue	487.9m
Free float	40%
Code	RBC
Primary exchange	NZX
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	(5.3)	8.0	28.6
Rel (local)	(6.9)	5.3	14.3
52-week high/low		NZ$0.30	NZ$0.18

Business description

Rubicon is an NZX-listed investment company whose ArborGen subsidiary is the world's largest integrated developer, manufacturer and commercial supplier of advanced forestry seedlings with operations in the US, Brazil and Australasia.

Next events

H1 period end	September 2018

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Edison profile page

Rubicon is a research client of Edison Investment Research Limited

Investment summary

Company description

Rubicon is an NZX-listed investment company and the 100% owner of ArborGen, the world's largest integrated developer, manufacturer and commercial supplier of advanced forestry seedlings. ArborGen operates in some of the world's most important forestry regions; it has leading market positions in the US, New Zealand and Australia and an established presence in Brazil. ArborGen aims to increase sales volumes and market share in each region through further penetration of its proprietary advanced seedlings products.

Valuation: Core valuation of NZ$0.74 per share

The carrying value of ArborGen in Rubicon's FY18 Annual Report was U$132m. The company's DCF model required a 26% pre-tax discount rate input to be consistent with this figure and yields a 'mid-case' of U$345m (using a 17.75% pre-tax discount rate, although full details of the DCF are not available). The financial performance of ArborGen will become increasingly apparent over time and form the basis for any earnings-based valuation analysis in due course. Ahead of this, our own DCF analysis indicates a **gross equity value of U$240m (or NZ$0.74 per RBC share)**, prior to adjusting for outstanding warrants and options. US operations are the largest contributor to this valuation and we show valuation sensitivity under a range of average selling prices (ASP) and gross margin scenarios. Pending further visibility of ArborGen's performance metrics, we conservatively estimate that the contributions to the core DCF from Brazil and New Zealand are c NZ 9c and c NZ 3c per share respectively.

Financials: Rising revenues, EBITDA with FY19 net debt peak

We expect to see good FY19 revenue progress with above GDP gains in the following two years. Favourable economic growth outlooks, rising market shares in the US and Brazil (from increasing advanced seedling penetration) and a step-up in NZ planting rates are key aspects. With modestly improving gross margins and relatively stable opex, we expect to see EBITDA uplifts in all three of our forecast years. We project the net debt position to rise to U$19m by the end of FY19, following modest free cash outflow and net M&A effects on previously announced transactions. Even allowing for further working capital absorption to support revenue growth, we expect Rubicon to be free cash positive from FY20 and for net debt to trend down accordingly.

Sensitivities: Geographic diversity with a long-term perspective

Reporting in US dollars, the translation of subsidiary earnings in Brazil and New Zealand will be directly affected by movements in average exchange rates, which in turn may be reflected in RBC's equity value, quoted in NZ dollars. **Geographically**, the US is the largest revenue generator but some diversification is provided from the other countries, which have different economic and subsector cycles. The **forestry sector** has an extended business horizon and, with plantation owner productivity a key driver of profitability, the development and planting of higher-yielding seedlings is a favourable long-term driver, as is population growth/household formation. The very nature of extended development and tree breeding cycles provides an **effective medium-term barrier** to meaningful competition emerging. We consider that a **migration by existing and new customers onto ArborGen's more advanced, higher-value seedling types** (especially loblolly in the US and eucalyptus in Brazil) represents a relatively low-risk route to growth. Whether ArborGen's GM seedlings (currently in development in Brazil) gain commercial acceptance remains to be seen, but could present a further step-up in revenue potential.

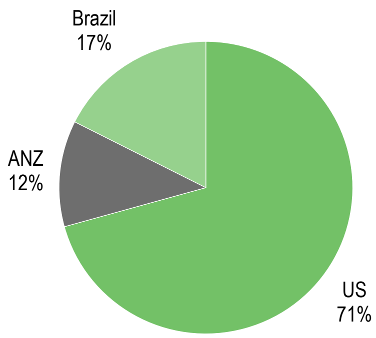
Company description: Forestry growth investor

Rubicon owns ArborGen, the world's largest integrated developer, manufacturer and commercial supplier of advanced forestry seedlings. Following the disposal of the business and assets of Tenon (at the end of 2016 and beginning of 2017), and acquisition of minority interests in June 2017, ArborGen became the sole operating business in the company. ArborGen's primary markets are commercial forestry plantation owners in the US, New Zealand, Australia and Brazil.

Creating value in the forestry supply chain

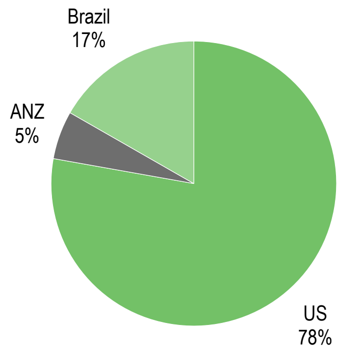
ArborGen is an integrated supplier of advanced seedlings to commercial forestry plantation owners. The business model includes primary research, development and ownership of extensive germplasm seed banks through to orchard-based production of superior seeds, which are cultivated in nurseries and sold as seedlings into the market through in-house distribution capability. Using its germplasm library and a full spectrum of pollination technologies, it produces next-generation seedlings from the best available genetic parents to increase yields for plantation owners through improved growth, form and resistance characteristics. As shown in the exhibits below, ArborGen supplied 347m seedlings through its three regional operations and generated c U$45m revenue in the year to March 2018 (12 months).

Exhibit 1: Revenue FY18 c US$45m



Source: Rubicon.

Exhibit 2: Seedling sales FY18 347m



Source: Rubicon

Independent commercial plantations are the primary customers. Market characteristics vary; ArborGen is the leading US supplier of loblolly pine seedlings and radiata pine seedlings in New Zealand, and is building a position in Brazilian eucalyptus and loblolly markets. Exposure to other tree species is less material. The key demand drivers for seedlings are harvesting rates and the maturity profile of existing plantation stock in the context of medium/long-term requirements of primary end-markets (including residential housing, pulp and paper and energy). ArborGen aims to migrate its customer base up the advance seedling value chain – facilitating improved plantation profitability – to grow its own revenue and profitability from a combination of mix, higher average selling prices and volume growth, taking market share particularly in the US and Brazil.

The revised Rubicon (RBC) board reflects the new group structure and, when CEO Luke Moriarty leaves as recently noted, US operational oversight will increase. The six ongoing members include RBC's two leading shareholders (chairman David Knott, Jr, Knott Partners and Ranjan Tandon, Libra Advisors) together with two NZ-based NEDs and two US-based NEDs with a blend of forestry, finance, investment banking and management consulting experience. The three new independent directors are to be part-remunerated in RBC shares, incentivising performance in the common interest of all shareholders. Alongside corporate change, the shareholder register has evolved as noted in the last annual report and is considered by the company to exhibit greater stability now.

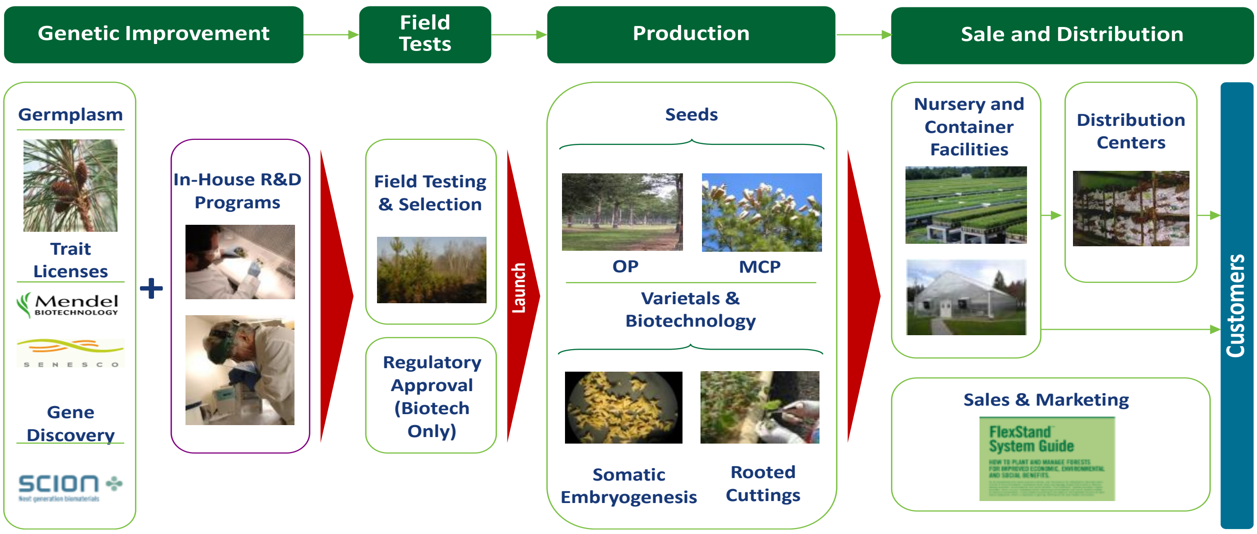
Advantaged forestry platform for profitable growth

In the following sections, we outline ArborGen's business model and development to the current position and go on to describe its three leading regions which, for different reasons, all have favourable growth outlooks. ArborGen is now under Rubicon's sole control for the first time. With an aligned year end and now greater visibility of financial performance, investors will be able to appraise the company, its market positions and therefore growth prospects more easily. Moreover, a legacy employee litigation case has been settled and the company appears to be in a position to fund further development and growth organically from internal resources. Hence, with the above distractions removed, we contend that the pieces are now in place for an extended phase of profitable growth for ArborGen and its parent company Rubicon.

Integrated business model with industry provenance

The original business was formed from the seed development programmes of JV partners Fletcher Challenge in New Zealand and International Paper, and WestRock (then Westvaco Corp) in the US in 2000. These same companies also contributed their seed orchard and seedling production assets in 2007 to create an integrated R&D and commercial sales platform. This is important in understanding ArborGen's long-established and large company provenance and business model.

Exhibit 3: ArborGen integrated business model



Source: Rubicon

Through a combination of in-house development and some collaboration and licensing activity, together with control over field tests, pollination and production, ArborGen is able to offer plantation owners high-quality seedlings with full traceability. This assurance comes from the known characteristics of at least one and increasingly both tree parents. Understanding the genetic make-up of the best performing seedlings and selectively cross-pollinating them over time improves both survival rate (eg disease resistance) and yield (wood composition quality and quantity).

With rotation (ie plantation to harvesting) cycles ranging from c 7 years for eucalyptus to c 25-30 years for addressed pine species, natural growing cycles, cumulative industry knowledge and an extensive germplasm database all provide effective entry barriers to conventionally pollinated seedling competition. ArborGen does not have commercial plantation assets, so is an independent seedling supplier to the independent forestry-owning sector. Among other industry participants, universities are typically research only-focused and the US state forestry agencies do not intensively develop their seed/seedling capability. There are some integrated forestry/forest product businesses (see our US section below), which typically meet their own seedling needs internally.

ArborGen has its own management team led by president and CEO Andrew Baum, an experienced plant biotechnology executive, who joined in March 2012 following the new VP of sales, marketing and development (John Pait) and VP of manufacturing (Warren Banner) appointments. There are also two operational general managers in Australasia and Brazil (who both joined in 2010) and senior financial personnel. This represents a stable team with extensive experience gathered across the spectrum of tree improvement research and development forestry management and end-market industrial usage, which has operated from its head office facility in Ridgeville, SC for over six years.

The total number of seedlings sold has increased from c 240 million in 2010 to c 350 million in 2018, with an associated revenue uplift in excess of U$20m to U$45m over the same time period (CAGRs of 4.8% and 8.8%,respectively). Bearing in mind lag effects – as core end-markets emerged from a severe downturn – on the forestry sector and that MCP seedling supply was constrained, this represents a reasonable benchmark for measuring future growth performance. We understand that the FY18 gross margin has increased by more than 200bp since 2010.

Some corporate achievements in the US and Brazil during the JV ownership phase include the following discrete steps:

- **2012: Acquisition of CellFor Inc assets**
  This added to and broadened ArborGen's presence in pine varietal research, expanding its germplasm library, and brought in nascent commercial sales operations. CellFor used innovative biotech propagation techniques to produce varietal (or cloned) seedlings and was established in 1999 from a merger between two forestry biotechnology companies (ie Silvagen and Pacific Biotechnologies), which had both been developing varietal pine seedlings since the mid-1980s. Price not disclosed.
- **2013: Commercial eucalyptus sales begin in Brazil**
  In 2013, an agreement with International Paper (IP) secured the exclusive rights to produce and market elite eucalyptus varietal seedlings to independent plantation owners for the first time. This agreement was expanded in early 2017 to include access to IP's eucalyptus germplasm library. Terms not disclosed. (ArborGen first established an office presence in Brazil in 2004, starting field trials with industry stakeholders during the following year.)

Just over a year ago, ArborGen came under the sole ownership of Rubicon in June 2017. As referenced in the FY18 Annual Report, management has since undertaken a comprehensive business and operational review, which has fed into a long-term Operational and Strategic Plan and an ArborGen 10-year plan, now adopted by the RBC board. As one would expect, this includes increasing underlying earnings and improving cash generation over time. In the context of industry characteristics, we do not expect an immediate transformation in financial performance and consequently, the impact of sole control is likely to become progressively rather than instantly apparent through Rubicon's reporting cycle, in our view.

We are aware of one other corporate step taken by ArborGen earlier this year.

- **2018: Taylor Nursery operating lease agreement**
  In February, ArborGen agreed a 10-year agreement to operate and modernise the Taylor Nursery in Trenton, SC from the South Carolina Forestry Commission. This represents the company's seventh US seedling production location; 15 million seedlings have been set for the 2018 selling season with potential capacity of c 30 million in due course. Terms were not disclosed.

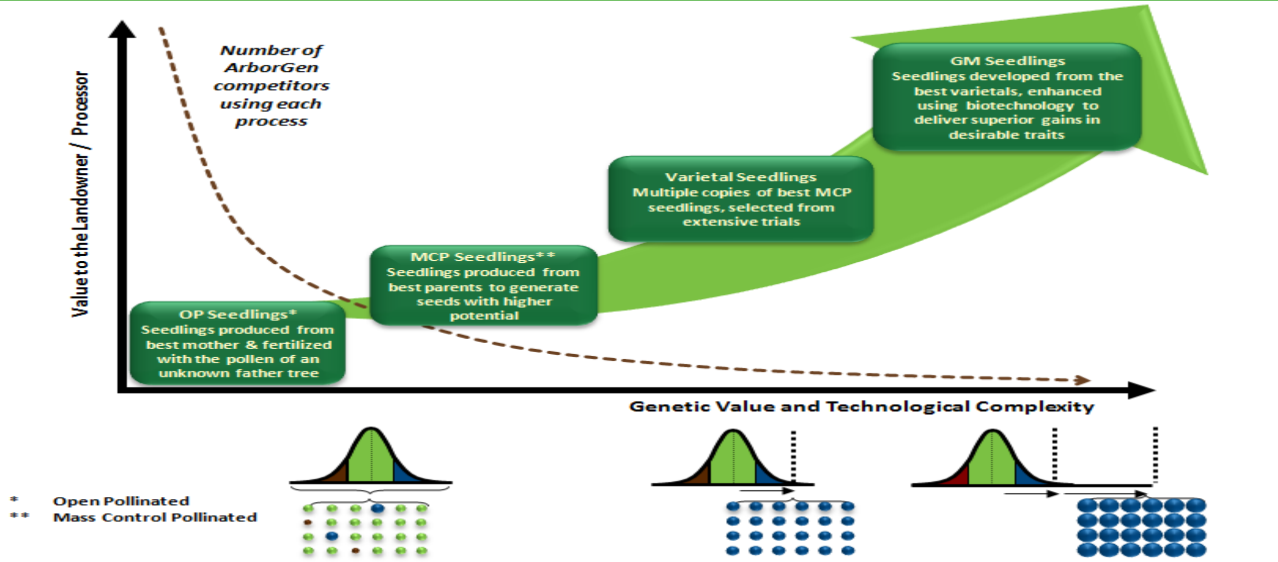
These lease agreements can be seen as a way of expanding seedling production capacity quickly without requiring an initial land capital outlay, and can also bring incremental capacity when weather events (eg cold weather or hurricanes) affect normal seasonal operations. We also see this as a potential route by which ArborGen can expand and scale up operationally in future without significant fixed capital spending.

One other development that we consider to be significant is the 2016 out-of-court settlement[1] of long-running litigation between ArborGen and some of the company's early employees; this was concluded at no material cost to Rubicon. The key point is that this issue should no longer be a distraction for management or investors. Reflecting on all of the above points, we consider that ArborGen is now unambiguously on the front foot under the sole ownership of Rubicon for the first time and in a position to convert its unique market position into profitable revenue development for the benefit of its stakeholders.

Moving up the forestry value chain

Against a backdrop of increased private sector forestry ownership (including divestment by former industrial owners and NGOs) and more intensively managed estates, generational improvement has been achieved in the productivity of commercial forestry plantations. As well as estate management practices, research-driven identification and cross-pollination of seedlings with superior, desirable properties supported by field trials and mass production techniques have made a significant contribution to commercial yields available to forestry owners. The process is one of continuous improvement, moving forward by producing next-generation seedlings from the best known parent trees. Exhibit 4 shows a progression of increasingly targeted or controlled breeding techniques to achieve this. ArborGen sells seedlings produced using three of these methods; it has conducted authorised GM field trials, although commercialisation is not currently permitted.

Exhibit 4: Seedling development technologies



Source: Rubicon

The most obvious characteristic valued by customers is growth rate/rotation cycle and volume of timber produced over a given time period. End-markets have different qualitative requirements; for example strength, rigidity, straightness and appearance are important factors supplying sawn wood to the building industry, whereas pulp and paper industry process cost and end-product performance are influenced by separated fibre length and quality. Certain tree species are acknowledged as the best source of these characteristics in each case. As shown at the bottom of Exhibit 5, the best breeding of these species increases the yield per hectare (through better resistance, greater incidence of better quality trees), hence increases revenue generation and profitability for plantation owners. ArborGen's focus is on developing seedlings with improved yield and quality for purpose.

[1] ArborGen Employee Litigation Concluded.

Significant presence in scale forestry markets

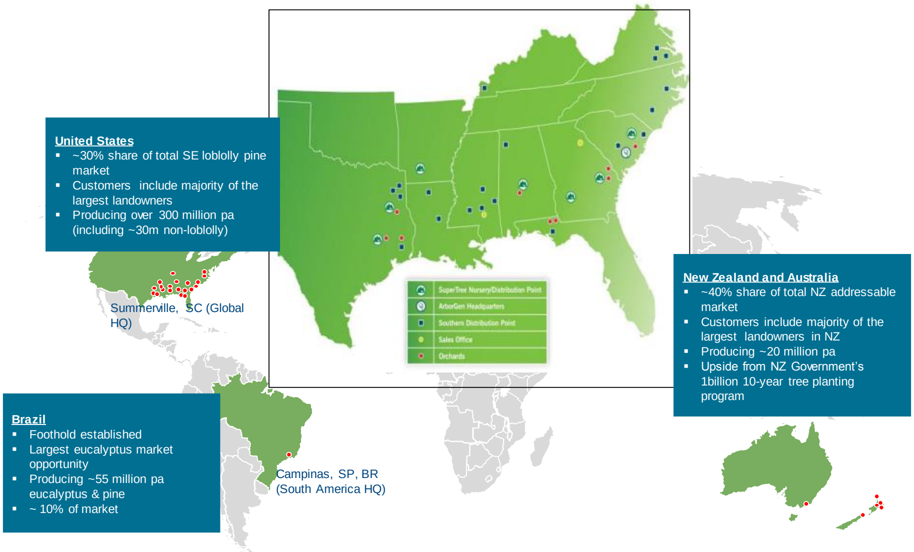
We have already noted ArborGen's geographic presence in three distinct regions (four countries). We now discuss the characteristics of its individual markets with more explicit detail on the company's operational footprint. Firstly, we summarise the strategic objective in each region as follows:

- **US:** volume growth with incremental gains in addressable loblolly pine market share through an increasing proportion of MCP and varietal seedling sales;
- **Australasia:** volume growth in an expanding New Zealand radiata pine market, at least maintaining market share with stable volumes in Australia after small near-term increases; and
- **Brazil:** deeper market penetration; significant increase in volume and addressable market share in growing eucalyptus segment and expansion in smaller pine species segments.

ArborGen has established operations and sales networks in each of these regions as shown in Exhibit 5.

Exhibit 5: ArborGen operational footprint

ArborGen operates 14 nurseries, 15 seed orchards, 30 distribution centres and three R&D facilities around the world



Source: Rubicon

The US is ArborGen's largest market, accounting for almost 80% of its total annual seedling sales. The above graph shows that its operations here are spread across 10 states located in the south and south-east of the country, mapping directly with the primary loblolly pine growing region. In New Zealand, radiata pine accounts for c 90% of plantation forests; the largest are on the North Island where ArborGen has a stronger presence, but it is now represented on the South Island also. In the US and Australasia, ArborGen operates substantially from owned orchard and nursey sites, with some leased land also. Lastly, the company's Brazilian head office and only nursery are both located in Sao Paolo state; its nursery and field trials partner sites for both eucalyptus and pine are substantially located in the south and south-east of the country.

Forestry plantations in ArborGen's active regions in the US and in New Zealand are substantially privately owned and independent, including family and institutional investors (eg forestry REITs), with a small number of larger, integrated forestry companies. In contrast, Brazil has more significant corporate ownership among companies securing industrial supply for pulp and paper, and energy generation. The larger corporate players typically have internal tree improvement activities and are not considered part of ArborGen's immediately addressable market. Otherwise, there are a limited number of large, independent competitors.

1. US – migrating up the value chain

As widely reported, the US economy is considered to be robust at present and the OECD projects GDP growth approaching 3% in 2018 and 2019. Tax reforms have benefited the economy and a rising interest rate scenario is now priced in by financial markets. The southern states are known as the ‘wood basket’ of the country, having sizeable producing plantation forests. The primary markets served (being the construction and pulp and paper industries) are cyclical, with annual activity influenced by pricing and exchange rates. The forestry sector has a longer-term horizon and has been receptive to the adoption of advanced seedling types to enhance productivity. The housing newbuild cycle is favourable currently and rising timber prices are beneficial for plantation owners. The US is ArborGen’s largest market and accounts for around two-thirds of revenue currently.

Scale market with substantial private ownership: The Southern Forest Futures Project published in 2013[2] declared that, following a significant divestment of plantations by the forest products industry up to 2008, 86% of the forest area in the south – some 200 acres/80m hectares – belonged to private landowners. At that time, two-thirds of this private estate was owned by families and individuals, with most of the rest accounted for by companies (including wood products businesses and financial investors such as timber investment management organizations (TIMOs) and REITs. Planted pine forests account for c 19% of southern forest land (39m acres/c 16m hectares in 2010), which straddles family/individual and corporate ownership and is a reasonable proxy for the market size. Loblolly pine is understood to be the dominant species among this planted forestry estate. Planted lobolly trees in this area have a growth rotation of 25-30 years and the new planting activity is driven most obviously by harvesting rates, but also owner profitability (with prevailing market prices a key factor) and perceived long-term industry requirements.

Established uses in industrial markets: We do not have up-to-date data to show current end-market demand, but the two primary markets for softwood grown and harvested in the US southern states are housing and construction for saw logs, and the pulp and paper industry for pulpwood.

- **Timber and wood products** are used in **housing markets,** both the newbuild (including structural timber framing, especially in single family homes) and remodelling (eg interior finishing products) segments. Strength, uniformity and appearance are all important requirements that advanced seedling plantations are capable of servicing in volume. Loblolly pine is also used to make panel products, posts and poles, pallets and crates.

At the end of June 2018, US housing starts (NAHB data) were running at a seasonally adjusted annual rate of 1.17m new homes in aggregate, of which 0.86m were single family dwellings (both of which were lower than seen in Q417 but well above their respective lows of 0.55m in 2009 and 0.43m in 2011 respectively). Projections are for total new home starts to increase to above 1.3m for the year as a whole, rising further in the next two years, with the single-family homes component increasing in the next two years to over 1m in 2020. Both of these levels are in line with the long-term average annual rate since 1980. The latest Harvard LIRA report notes a rising growth in remodelling spend (not all of which would be timber-related) since the beginning of 2016 and projects the current annual rate of c 7% to be at least sustained to the middle of 2019.

- **Pulpwood markets** are chiefly split between the **pulp & paper** and **biomass energy** industries. Loblolly pine is the dominant plantation species in the US south and, according to the US Department of Agriculture (USDA),[3] softwood in total accounted for 78% of total southern pulpwood production in 2016 (c 134m green tonnes). The US is the largest pulp & paper producer globally and is also a significant importer. This industry uses both soft and hardwood pulps depending on the product being manufactured reflecting different fibre characteristics. Moreover, the genetic make-up of the wood has significant bearing on the

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[2] Forest Ownership Dynamics of Southern Forest, US Department of Agriculture.

[3] Southern Pulpwood Production, 2016, US Department of Agriculture.

pulping process and associated costs. For example, lignin is extracted in the conversion to pulp and, hence, reduced lignin levels reduce intermediate manufacturing costs. Advance seedling development, identifying and breeding reduced lignin seedlings, is a value differentiator. Where this can be combined with faster growth characteristics – improving the yield of juvenile trees at the thinning stage – the benefit is amplified. Biomass energy production facilities have grown dramatically in the south in the last 10 years (to c 9.2m tons annual capacity, primarily in wood pellet form4). Historically, forest and mill residues were the primary sources of material for wood pellets but softwood pulpwood has become the largest supply source. Exports account for well over half of wood pellet production in the south[5] with European industrial power generation a particularly larger consumer, whereas domestic market demand is influenced by the relative pricing of competing residential heating energy sources.

ArborGen's presence in the south-eastern US derives from its former JV investors, International Paper and Westvaco. It now has seven active nursery operations across five states (Texas, South Carolina, Georgia, Alabama and Arkansas), regional seedling sales offices and a number of seed orchards and field trials. It sells to most of the largest plantation owners and TIMOs in the US south, typically via multi-year contracts with a long tail of others. Loblolly pine is the primary species sold, with smaller amounts of other pine species. Its strategy is to grow volumes and market share – further consolidating its leading supplier status – through the supply of an increasing proportion of MCP and varietal seedlings. ArborGen had previously undertaken research and development of GM freeze-tolerant eucalyptus seedlings in the US, but is not currently actively doing so.

Sizeable addressable market even allowing for integrated players: Using Forest Economic Advisors LLC analysis, Rubicon management estimates that total loblolly seedling annual demand is in excess of 850m currently (of this c 700m represents the addressable market) and c 1bn in the mid-cycle phase.

We are not aware of any other large, independent suppliers of loblolly pine with the breadth of ArborGen's field operations or integrated research and development activity. State forest agencies appear to offer seedlings as an adjunct to their own forestry management activities, but we believe that their seedling range offered is more limited relative to ArborGen. There are two large quoted and integrated forestry companies – Weyerhaeuser (NYSE:WY) and Rayonier (NYSE:RYN) – which are both timberland REITs and meet their own seedling needs internally, as well as supplying some to third parties. Consequently, we believe that these companies are not currently considered to be part of ArborGen's addressable market.

2. Brazil – building market share

After two years of negative GDP performance, Brazil returned to growth in 2017 and the OECD expects improving y-o-y progress in both 2018 and 2019. The Brazilian forestry industry is one of the largest in the world with favourable climatic conditions, and is the world's largest producer and exporter of hardwood pulp. ArborGen has had a presence in the country for 14 years now and is targeting growth in both eucalyptus and pine seedling volume and market share.

Scale market with strong industrial ties: According to the Brazilian Industry of Planted Trees (IBA) Report,[6] there are c 7.8m hectares of plantation forestry in the country that is recognised as being a global leader in productivity with relatively short rotation periods (from initial planting to harvesting). Of the total, 5.7m (c 73%) is eucalyptus and 1.6m (c 20%) is pine species. The eucalyptus plantation area is up almost 16% from 2010 to 2016, while the aggregate pine plantation area is down by c 10% over the same period. The majority of these plantations are found in the

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[4] US Energy Information Administration

[5] Global Wood Pellet Industry and Trade Study 2017, IEA Bioenergy.

[6] Industria Brasileira de Avores

Atlantic Coast and other southern states, and both species have reputations as plantation productivity leaders globally.

Primary domestic markets have shaped the ownership structure of these plantations as industrial customers secure process raw materials. Among these, the pulp and paper sector owns 34% of the total plantation area with 14% by the steel industry (using charcoal as fuel) and a further 10% by wood product producers. Export market demand is important in these sectors:

- Pulp – second largest global producer (69% of production is exported).
- Paper – eighth largest global producer (20% exported).
- Wood panel products – eighth largest global producer (14% exported).

Around one-quarter of lumber produced is also exported. Hence, the Brazilian plantation forestry industry has scale in a global context and is an important contributor to domestic GDP, while also having a positive trade balance overall in these products. The remaining plantation ownership is largely accounted for by independent operators at 29% and financial investors 10%.

Building a Brazilian business: ArborGen opened a Campinas R&D office in 2004 to run long-term GM eucalyptus field trials focused on the pulp and paper industry. In 2013, ArborGen began production and sales of conventionally pollinated (ie non-GM) eucalyptus varietal seedlings following an exclusive licence agreement with International Paper. (This corporate relationship was extended to include IP's eucalyptus germplasm library in 2017, as noted earlier.) ArborGen's strategy in Brazil is to sell to the non-integrated companies that do not have active tree breeding programmes, and which otherwise would be limited to planting only readily available commodity seedling products. In 2017, ArborGen produced and sold c 58m varietal seedlings, of which c 50m were eucalyptus and c 8m were pine species. We understand that annual gross market demand is currently c 600m, of which 300m is considered to be addressable (ie independent, non-integrated forestry companies).

FuturaGene (formerly AIM-listed, acquired by Suzano Pulp & Paper in 2010) is considered to be a competitor in GM eucalyptus biotech development. It received regulatory approval for one specific trial deployment in Brazil in 2015 but, to date, we do not believe the company has commercialised those seedling products. ArborGen has been active in research and development in this area including field trials, but is yet to seek regulatory approval status for commercial deployment of any of its biotech products and we believe it is unlikely to do so over our estimate horizon. The general development of GM forestry feedstocks has been contentious and challenged by environmental groups, particularly in the Americas.

3. Australasia – NZ planting activity stepping up

New Zealand has seen good GDP growth in recent years; the OECD projects solid 3% growth in both 2018 and 2019 (and similar economic progress in Australia), consistent with the rate achieved in 2017. New Zealand has a slightly smaller commercial plantation area than Australia, but it accounts for over 80% of regional revenue. Forestry is the country's third largest export earner and is about to enter a significant and extended period of harvesting and re-planting, we believe.

Important NZ industry: According to the New Zealand Forest Owners Association[7] the country has 1.7m hectares of plantation forestry, the vast majority of which (1.5m hectares or 90%) is radiata pine. Over 90% of these forests are owned by the private sector. As a measure of annual activity, provisional estimates for 2017[8] suggest that c 47,000 hectares were planted with radiata pine seedlings in the year, largely in the form of re-planting harvested areas (with just 4,000 hectares of new land). While there may not be a full correlation, 48m radiata pine (of c 51m total) tree stock

[7] Facts & Figures 2016/17

[8] Provisional Estimates of Tree Stock Sales and Forest Planting in 2017, Ministry for Primary Industries.

sales were made, which was slightly down on 2016. As a rough rule of thumb, this indicates a planting ratio of c 1,000 seedlings per hectare.

To provide some context, annual radiata pine tree stock sales have been in the 45m–50m range for the last five years, with a post-2003 high and low of c 65m (2012) and c 29m (2006) respectively. Within these annual sales figures, it should be noted that the proportion of control pollinated seedlings has increased. With the exception of the 2005-10 period, total species annual re-planting rates have trended gently higher since 1991 from c 21,000ha to c 49,000ha seen in 2017. New planting activity has been more volatile; it spiked up in the early to mid-1990s – coinciding with the sale of NZ government forestry interests to the private sector – reaching a peak of almost 100,000ha in 1994 before slipping below 10,000ha in 2005, where it has largely remained since. Given that radiata pine is the dominant species, we think it reasonable to take the above re-planting profile as a proxy for this species.

Significant increase in activity on the near horizon: As radiata pine has a 25- to 30-year growth rotation, this means there is now a significant volume of trees in the 16- to 25-year-old age category approaching maturity/harvesting age. Subject to prevailing log prices, this indicates that plantation owners are set to harvest above average levels of trees and receive above average revenue levels. Typically, one would expect rising tree stock sales and replanting activity to follow. This coincides with a new NZ government One Billion Trees initiative, targeting the planting of one billion trees in the 10 years to 2027. The facilitators for this will need to be put in place and include some financial assistance for smaller plantation sizes. We are not aware of any specific species targets at this stage; while there is an inference that other species are to be encouraged, radiata pine must form a significant proportion of the uplift. Referring back to historic planting activity, the implied average annual planting rate sustained over 10 years is equivalent to the generational peak in 1994. Of necessity, there will be a two- to three-year ramp-up period such that the annual peak during this 2018-27 period will be higher still, if successful.

Leading market player, well positioned for growth: ArborGen sold c 19m seedlings in Australasia in FY18, of which c 80% were in New Zealand and radiata pine. This represents around one-third of the total species tree stock sold in the country and was serviced from the company's six nursery operations. Competition appears to come from a number of regional nursery suppliers of seedlings, perhaps with a narrower technology offering compared to ArborGen. There is also likely to be some larger integrated forestry players that meet seedling requirements internally, but we are unable to quantify this.

Valuation

The true trading performance of ArborGen will become increasingly apparent and form the basis of our earnings-based valuation analysis in due course. Ahead of this, we use a DCF-based approach to provide a core valuation and some sensitivity analyses around this.

Corporate actions provide valuation benchmark

The carrying value of ArborGen in Rubicon's FY18 Annual Report was U$132m (see note 15, page 27), slightly above the U$124m fair value of identifiable net assets recognised on acquisition and prior to adjusting for warrants and options outstanding[9]. The Annual Report also summarises an internal DCF analysis in support of this carrying value. Under this model, we note that a pre-tax discount rate of 26% is the required input to achieve the carrying value referenced, while a 'mid-

9 **Warrants** outstanding equal to 5% of the issued ArborGen share capital arose out of the company's acquisition of CellFor in 2012. **Options:** ArborGen's senior management team holds options in respect of c 5% of ArborGen's issued share capital. These options are fully vested and can be exercised (subject to conditions) at the price per share paid by Rubicon when it acquired 100% of ArborGen.

case' 17.75% pre-tax discount rate yielded a U$345m value. Based on this modelling, therefore, the carrying value would appear to be set conservatively.

Edison DCF core gross equity valuation of NZ$0.74 per share

Using our own – implicitly more conservative - assumptions, we have built our DCF based on three regional operations in the context of market size and macro growth expectations outlined in earlier sections. In aggregate, the CAGR to year 10 for seedling volumes works out at just below 7% (higher than this in Brazil from a lower market share base) and just above 8% for average selling prices (or ASP, given the migration to higher-value seedlings and improved mix in the US). A modest improvement in gross margin is factored in over the 10-year period. Using a 10% post-tax discount rate, 3% terminal value growth (the latter metric consistent with the company's model) and factoring in net debt (last reported adjusted for FY19 M&A) generates a **gross equity value of U$240m (or NZ$0.74 per RBC share).** In comparison, discount rates of 9% and 11% yield equivalent valuations of NZ$0.92 and NZ$0.61 per share respectively. Note that:

- the gross equity valuations should be adjusted for **warrants and options** totalling c 10% of ArborGen's existing issued share capital, yielding a c NZ$0.68/share value to RBC shareholders (adjusting for proceeds on exercise).
- the DCF includes **parent company central costs** (currently c U$1m pa), which lower the DCF valuation compared to a standalone ArborGen. This would be relevant in the case of a 'valuation event' such as a disposal, partial disposal or IPO of the business; and

As there is a material difference between our DCF and the aforementioned 2018 Annual Report commentary, it is clear that our analysis includes more conservative assumptions. We are comfortable with this position pending further visibility on ArborGen's performance metrics, which should naturally become more apparent through Rubicon's reporting cycle.

Other sensitivities: As the largest part of the business, US profitability is the primary driver of our DCF model. We now flex some of the core assumptions to give an indication of the DCF value sensitivity, as shown in Exhibit 6.

Exhibit 6: Rubicon's NZ$ p/share value in different US revenue, gross margin scenarios

ASP CAGR %*	8.0%	10.0%	12.0%	14.0%	16.0%
Gross margin*					
45%	0.40	0.47	0.56	0.65	0.75
50%	0.50	0.58	**0.68**	0.79	0.91
55%	0.59	0.69	0.81	0.93	1.07

Source: Edison Investment Research. Note: *Flat growth rates for 2022-29 inclusive (2019-21 uses published estimates).

Compared to the central figure shown in the above table, our core DCF value includes a slightly lower ASP CAGR and slightly higher gross margin input for US operations for 2022-29.

As an illustration, we have also separately removed the gross profit contributions from Brazil and Australasia beyond FY21 – leaving everything else unchanged – to give an indication of their respective contributions to the DCF value. (Strictly speaking, we should also make explicit adjustments elsewhere in the DCF model, eg working capital and capex assumptions to be consistent; for the present purpose we have not done this and, hence, the figures shown should be taken as illustrative only.)

- **Brazil** contributes **c NZ 9c** to the core DCF.
- **Australasia** contributes **NZ 3c** to the core DCF.

Sensitivities

Rubicon's financial reporting is now clearly driven by ArborGen's trading performance. Reporting in US dollars, the translation of subsidiary earnings in Brazil and New Zealand will be directly affected by movements in average exchange rates, which in turn may be reflected in RBC's equity value, quoted in NZ dollars. Research and development spend will continue to be a material line item, but rising revenue, profitability and cash generation may permit dividend payments in due course.

Geographic and sector diversity: ArborGen's country-based seedling operations are species specific and substantially geared to local market demand. Its three trading regions have different economic drivers and subsector cycles, which provides some macro diversification, although there are some ultimate end-market linkages (eg NZ timber exports and Brazilian pulp exports to the US). That said, the US is clearly the largest revenue contributor, and the newbuild housing and remodelling markets are significant drivers of demand for wood products.

Favourable long-term market drivers: A rotation cycle of 25+ years for pine species extends across multiple economic cycles and c seven years for eucalyptus or at least one conventional economic cycle. This affects demand for wood-based products directly, but not necessarily that for seedlings in the same year. The profitability and cash flow of plantation owners is a key driver – timber market pricing encapsulates a number of prevailing supply and demand factors in any one year but, ultimately, 'cost to serve' is the critical aspect under a plantation owner's control and yield/productivity is at the core of this. This is a positive long-term demand driver for increasingly advanced seedlings. We see population growth, household formation and, potentially, sustainable energy strategies as important thematic long-term growth drivers, while the recyclable nature of paper and fibrous packaging may also be seen as environmentally preferable to plastics. Adverse exogenous events (eg weather or disease) could damage short-term plantation profitability in a particular region but be positive for medium-term replacement rates.

Effective entry barriers: Extended development timeframes (across research, field trials, pollination cycles and volume seed generation) and access to genetic crosses are effective medium-term entry barriers to new seedling suppliers. Theoretically, this could be lower on shorter rotation species; this could also be beneficial to ArborGen in the Brazilian market where its market share is lower. If integrated forestry companies elected to increase third-party seedling sales (to competing forest owners) or chose to outsource supply (increasing the addressable market), it could have consequences for existing suppliers.

Market opportunities: In established markets, mean reversion in US house building rates and faster forestry harvesting would further stimulate re-planting, possibly with mix and volume benefits to those suppliers that are able to offer advanced/next-generation seedlings. Entry into a new geographic region such as China would need to be supported by species-specific germplasm and development expertise. We see eucalyptus as a potential source of revenue and profit growth on two fronts. Firstly, bringing advanced conventional seedling technology to the independent forestry sector in Brazil should facilitate market share increases in that sizeable market. Secondly, more extended acceptance of biotech or GM seedlings would accelerate the rate of penetration in our view. There are greater regulatory and market acceptance hurdles here and in the US and these are unlikely to be overcome in the near term, in our view. We have not included GM seedling revenues in our explicit three-year earnings projections, although they do feed into our DCF analysis (see next section).

Financials

There has been a significant change in group structure, disposing of the main profit/cash generator (Tenon) and, after distributions to shareholders, reinvesting proceeds to move to a wholly owned position in the sole remaining operating company. Rubicon was a founder shareholder in ArborGen and has had long-term management and financial oversight of its performance, but public disclosure has been limited until now. Changing to a concurrent March year end also means that a full 12-month trading period is yet to be seen to provide a base, comparator year. We anticipate that there will be significant seasonality in ArborGen's trading pattern with profitability and positive cash flow weighted to the second half, correlating with the main US selling season.

Volume growth, higher average pricing and operational gearing

Given that Hurricane Irma provided some disruption in the US in the 2017 selling season (ie FY18) we expect to see good FY19 revenue progress with above GDP gains in the following two years. Favourable economic growth outlooks, rising market shares in the US and Brazil (from increasing advanced seedling penetration) and a step-up in NZ planting rates are key aspects. We factor in:

- **Revenue:** volume growth of c 11% in FY19 followed by c 8% and then c 5%, with the two later years amplified by rising average selling prices and mix a key contributor to this.
- **Gross profit:** margins in the low 40% range in FY19 with modest incremental improvement.
- **EBITDA:** U$5m (US GAAP) in FY19, comparable to FY18 (six months only) with a better H2 offset by the seasonally quieter H1. Progress thereafter from rising gross profit and relatively stable opex (including development spend). The NZ IFRS adds back development spend and, on this basis, we expect to see EBITDA uplifts in all of our forecast years.

Net debt to step up in FY19, trending down thereafter

We expect the end FY18 net debt position of U$10m to almost double to U$19m by the end of FY19. This reflects our anticipation of modest free cash outflow (including some inventory re-stocking in working capital) and M&A effects (being a $10m final ArborGen deferred payment net of U$3m proceeds related to the Tenon exit). Even allowing for further working capital absorption to support revenue growth, we expect Rubicon to be free cash positive from FY20 and for net debt to trend down accordingly, absent any further corporate investment. In other words, we believe that further organic research and development activity at current levels can be funded by internally generated profit and cash flow without recourse to additional external capital funding.

Asset-backed balance sheet

Rubicon's NZ IFRS NAV at the end of March 2018 was U$152m (US 31c or NZ 47c per share). The fixed asset base comprises U$107m intangibles (attributed to IP and product development) and U$44m tangibles (including U$26m freehold land and buildings, U$12m leased buildings and the remainder in plant and machinery). By definition, the other balance sheet items net off; U$25m of inventory accounted for the majority of net working capital and was largely offset by net debt and, at that time, deferred consideration, both c U$10. The end-FY18 balance sheet was structured with U$23m long-term debt with cash and short-term debt of U$29m and U$16m respectively. We expect to see in-year seasonal working capital investment partly unwinding by year end and, for the end of FY19, we have assumed an unchanged long-term debt position partly offset by cash in hand. All of this debt resides within the ArborGen subsidiary; it has a U$16m long-term bank facility (to 2036) and a U$17m overdraft facility (to August 2021) in place which, in the context of our projections, is sufficient for the company's needs in our view. Separately, under NZ IFRS development spend is capitalised (rather than expensed) and, other things being equal, this means that the reported NAV will exceed and diverge from its US GAAP equivalent.

Exhibit 7: Financial summary

US$m	2017R	2018	2019e	2020e	2021e
March (from 2018 onwards)	15m to Sep	6m to March			
PROFIT & LOSS					
Revenue	6	35	51	59	65
Cost of Sales	(4)	(19)	(30)	(34)	(38)
Gross Profit	2	16	21	25	27
EBITDA - US GAAP	(6)	6	5	9	11
EBITDA - NZ IFRS	(1)	6	10	14	17
Operating Profit (before GW and except.)	(2)	5	7	11	14
Intangible Amortisation	0	0	0	0	0
Exceptionals	(1)	(4)	(6)	(6)	(6)
Associate	3	0	0	0	0
Operating Profit	0	1	2	6	8
Net Interest	(2)	(1)	(2)	(2)	(1)
Profit Before Tax (norm)	(1)	4	5	10	12
Profit Before Tax (FRS 3)	(2)	0	(0)	4	7
Tax	0	2	0	0	0
Minorities	0	0	0	0	0
Discontinued	(4)	0	0	0	0
Profit After Tax (norm)	(1)	6	5	10	12
Profit After Tax (FRS 3)	(6)	2	(0)	4	7
Average Number of Shares Outstanding (m)	425.0	487.9	487.9	487.9	487.9
EPS - normalised (c)	(0.2)	1.2	1.1	2.0	2.5
EPS - FRS 3 (c)	(1.4)	0.4	(0.0)	0.9	1.4
Dividend per share (c)	0.0	0.0	0.0	0.0	0.0
Gross Margin (%)	33.3	45.7	41.4	41.6	42.2
EBITDA Margin (%)	(16.7)	17.1	20.4	24.2	25.6
Operating Margin (before GW and except.) (%)	(33.3)	14.3	14.6	19.1	21.0
BALANCE SHEET					
Fixed Assets	187	151	149	147	145
Intangible Assets	125	107	107	107	107
Tangible Assets	62	44	42	40	38
Investments	0	0	0	0	0
Current Assets	81	64	43	50	59
Stocks	41	25	27	31	34
Debtors	9	10	12	13	14
Cash	31	29	4	6	12
Current Liabilities	(57)	(36)	(14)	(14)	(15)
Creditors	(38)	(20)	(14)	(14)	(15)
Short term borrowings	(19)	(16)	0	0	0
Long Term Liabilities	(51)	(27)	(27)	(27)	(27)
Long term borrowings	(45)	(23)	(23)	(23)	(23)
Other long term liabilities	(6)	(4)	(4)	(4)	(4)
Net Assets	160	152	152	156	163
CASH FLOW					
Operating Cash Flow	(3)	4	7	10	13
Net Interest	(4)	(2)	(2)	(2)	(1)
Tax	0	0	0	0	0
Capex	(5)	(3)	(7)	(7)	(7)
Acquisitions/disposals	66	2	(8)	0	0
Financing	12	(1)	0	0	0
Dividends	0	0	0	0	0
Net Cash Flow	66	0	(9)	2	5
Opening net debt/(cash)	65	33	10	19	17
HP finance leases initiated	0	0	0	0	0
Other	(34)	23	0	0	0
Closing net debt/(cash)	33	10	19	17	11

Source: Company. Edison Investment Research. Note: 2017R was restated to show discontinued operations separately. Significant other items in 2017R and 2018 cash flow relate to M&A activity associated with the disposed Tenon operations.

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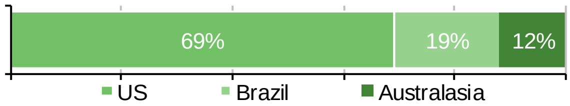
Revenue by geography FY18



Management team

CEO: Luke Moriarty

Mr Moriarty was previously a member of the executive office of the Fletcher Challenge Group and instrumental in the separation of its constituent parts. He is a director of ArborGen and was formerly a monetary policy adviser to the Reserve Bank of New Zealand. Mr Moriarty is expected to leave the Rubicon board during FY19, as announced on 14 August.

Chairman: David Knott, Junior

Appointed to the board in February 2017 and assumed the chairman role in August 2018. Co-managing partner, co-CEO and co-chief investment manager of Knott Partners (28.3% RBC shareholder).

Principal shareholders (30/04/18)	(%)
David Knott	28.3
Libra Fund LP/Ranjan Tandon	17.6
Perry Corporation/Richard Perry	7.0
Accident Compensation Corporation	6.6
Irvin Kessler	5.1

Companies named in this report

International Paper, WestRock, Suzano Pulp & Paper, Weyerhaeuser, Rayonier