PROVINCIAL DEVELOPMENT UNIT
New Zealand Government

2.8 THE MANAWATU-WHANGANUI BIO-FORESTRY ALLIANCE

PGF Application		For: Approval	
Applicant:	NZ BioForestry Limited (NZBF)	**Pipedrive ID #**	Commerci
Entity Type:	Company	**PGF Funding Sought:**	$Commercial Information
Region	**Manawatu-Wanganui**	**Total Project Value:**	$Commercial Information
Tier:	**1 - Regional**	**Co-contribution rate:**	Commerci %. Commercial Information estimated at $Commercial Informati
Sector:	**Technology and Technical validation**	**Funding Structure:**	Grant

We recommend that the SROs:

a) **Approve** $380,500 from the PGF fund towards the Manawatu- Whaganui Bio-Forestry Alliance project subject to:

- Comme% cash contribution ($Commercial Informat) to be paid out Commercial Information;
- Confirmation of project costs with supporting documentation; and
- An agreement satisfactory to the PDU ensuring that should the project not proceed, intellectual property developed from the science will be made publically available.

b) **Note** this differs from the application that requests PGF funding covering Commerci% of the forecast costs. Given the complex negotiations and arrangements required to bring the project to fruition we believe it is important to require cash co-contribution equal to the PGF grant.

c) **Note** funding is via a grant. Should the full project not proceed the intellectual property developed from the science is to be made publically available.

d) Commercial Information

e) **Note** an MPI assessment is attached

f) **Note** That PLA/PHA (Poly Lactic Acid/PolyHydroxyAlkanoates) is basic raw materials to produce non-petroleum based, environmentally friendly rapidly biodegradable plastics. These polymers can be processed to produce food grade solid containers and products and protective films.

Proposal:

NZBF's proposed project aims to deliver high value plywood, bioplastic raw material substitutes for petroleum-

based plastics and bark based bio-fuels. The project would incorporate the funding and commissioning, on a Marton industrial site with good rail and road logistic connections:

- Commercial Information
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Estimated capital cost is in the region of NZ$Commercial Inf.

PGF funding of NZ$Commercial I has been requested to undertake testing to validate the technical approach and science, key for the completion of the Investment Information Memorandum.

- Test that New Zealand radiata pine logs can produce plywood, with acceptable specifications and economics, on modern plywood mill technology (Japanese equipment).
- Test that the NZ radiata residues can provide the feedstock to produce PLA/PHA from fermentation of the cellulose in Pinus radiata (Taiwan equipment). The technology is based on research from the Institute of Nuclear and Energy Research (INER) in Taiwan, which now operates a large pilot plant.
- Send radiata bark to the UK to test for blending with coal as a fuel for industrial boilers for heat, power generation that would have applications particularly in Japan.

Commercial In will be used as independent advisors/auditors of the output of this testing.

There is considerable public benefit in the successful investment in and commercial operation of the new plant that would be reflected in significant additionality and potential spillovers for NZ wood processing industry from:

- The introduction of new export products and wood bio-refinery and bio-plastic production technology
- The potential to expand this model to other regions within NZ
- The use of NZ's sustainable plantation forests to produce a sustainable environmental alternative to petroleum-based plastics
- New uses for iwi owned forestry assets and investment and employment opportunities.

Background

Wood Processing Economics

The market in the USA for higher value Decorative and Underlay plywood from softwood has opened up due to enforcement of anti-logging policies around non-sustainable hardwood. Target customers are currently serviced by Asian tropical hardwood. Shortages are increasing year on year due to reducing availability of indigenous trees, plantation growers facing increasing competition from alternative land uses and government restrictions on both what can be harvested and how it can be harvested. With these shortfalls compromising downstream manufacturing of finished consumer goods, the consumer product manufacturers are open to investment in plywood production that is based on sustainable feed-stock.

Processing logs to make higher value plywood produces a high value product and generates good quality, clean fibre for conversion into PLA/PHA and bark for boiler fuel. The latter maximizes the value recovery and profits of the residual out-turn from the whole of log primary breakdown into plywood. It is noted that currently the NZ economics of sawmills and subsequent value recovery from downstream activity can face severe challenges due to yield, value, labor and logistics costs compared to similar operations in other regions of the world.

Commercial Information

Commercial Information

This is a potential whole of log solution for NZ radiata pine.

Negotiations

Production Plant Location

Commercial Information

Capital Cost

Commercial Information

Assessment against the PGF criteria:

Eligibility Criteria

This project is eligible for PGF funding. The successful introduction of the technology to the NZ forestry sector

will be a step change leading to the creation of new permanent jobs.

Productivity Potential

The Manawatu-Whanganui is a new forestry region with its first rotation of major wood flow (1.9m cubes per annum) only just starting. The project brings new technology to NZ from Asia and the UK that ensures NZ processing is at a similar level of productivity to what is found amongst our Asian log buying nations. This is a zero-waste project, by using every element of log production the project will be in a position to increase output value for local logs and build scale not only in its operations but also ancillary services such as plant nurseries, forestry, glue manufacture and housing products. Once proven the concepts can be shared with other forest regions in New Zealand.

Policy objectives and regional priorities

Commercial Information

PGF Criteria	Assessment Commentary	Rating (0✓ to 5✓)
Link with fund and government outcomes **Note: the benefits identified below will accrue should the wood processing plant proceed**		
Creates permanent jobs	The full project has the potentially to have a strong economic impact – new investment into the region, generation of new jobs, improved profitability and income streams. Initial assessment indicates Commerci direct new regional jobs (2020-2025).	✓✓✓✓
Delivers benefit to the community	Supports the economic viability of investment in new wood processing plants. The new Asian and UK technology, if successfully introduced will ensure that the value of the region's logs which is currently realised overseas will be retained within the region. Greater local wood processing potentially reduces the impact on regional roads of carting logs over long distances to export ports.	✓✓✓✓
Increased utilisation and returns of Maori asset base	A large portion of current forests are on iwi land. Average rentals are a third of what is being paid in regions with local processing capacity. By bringing processing capacity into the region transport distances for logs reduce. Increased downstream wood processing potentially provides an opportunity for Iwi to improved economic returns from their forestry holdings.	✓✓✓

Enhanced sustainability of natural assets	No clear alignment.	
Mitigation of climate change effects	Commercial Information A reduction in harvest waste and slash will provide a positive impact on the environment through less wood waste material at risk from entering adjacent waterways.	✓✓✓
Additionality		
Adding value by building on what is already there	Investment in the bioprocessing of waste would align to existing and new forestry value-add manufacturing. The combined value from timber and waste product will place local downstream manufacturing on a competitive footing with Chinese and Asian log buyers.	✓✓✓
Acts as a catalyst for productivity potential in the region	Support the economic viability of new down-stream manufacturing	✓✓✓
Connected to regional stakeholders and frameworks		
Alignment with regional priorities	Expansion of forestry is a new priority for the Manawatu-Whanganui region.	✓✓✓
Support from local governance groups (inc. Councils, Iwi/Hapu)	Engagement with regional leaders, including Iwi, reflected in the Alliance	✓✓✓
Governance, risk management and project execution		
Robust project management and governance systems	The project responsibility will sit with the three partners in the company while working closely with alliance partners	✓✓✓
Risk management approach	A detailed project plan has been developed. The critical pathway now is to build the business case and the Information Memorandum. The preliminary step is the completion of the science that is the subject of this application	✓✓✓
Future ownership / operational management	This will be determined on the successful delivery of the information memorandum in support of proposed capital raising.	✓✓
Analysis of the benefits and costs		

The proposal supports forestry in NZ to optimise and create higher value products and improve land use. It supports regional job growth and provides a model that potentially could be scaled and rolled out across regional NZ.

The project has a high-risk, high potential reward characteristics and the PDU approach is designed to reflect and manage these.

The project can be considered as a small premium payment (the PGF funding) with a potentially large payoff for the government's objectives and outcomes.

Financial Analysis

Costings in relation to the proposed project deliverables have been provided. Confirmation of project costs with supporting documentation to be requested

Funding Arrangements

PGF Funding against paid invoices on a pro-rata basis

Due Diligence and Ownership

Shareholders:
The three shareholders of the company are Formana Ltd, ForestX and Inspira Ltd.

Fomana Ltd:
Wayne Mulligan CEO
Privacy of natural persons

Commercial Information

Paul Morgan – Managing Director
Privacy of natural persons

Privacy of natural persons

ForestX

Kim von Lathen

Privacy of natural persons

Inspira Ltd: International Plywood and Taiwan Connections

Mr. Kai Hsuan Lin

Privacy of natural persons

Risk Assessment

The key risks to the PDU and proposed mitigations of this investment are as follows:

Type of risk	Risk description	Mitigations	Risk Rating L/M/H
Viability	The science does not support the proposed project	Agreement satisfactory to the PDU ensuring that should the project not proceed, intellectual property developed from the science will	Medium

		be made publically available.	

Consultation undertaken or implications:

MPI:
Memorandum

Ref:	**Proposal from *NZ Bio Forestry Ltd.***
To:	**Provincial Development Unit**
CC:	**MPI PGF Programme Team**
From:	**Luke Southorn** **Director, Regional Economic Development & Partnerships**
Prepared by:	**Andrew Clark** **Development Manager, Regional Economic Development & Partnerships**
Date:	**19 March 2019**
Subject:	**MPI contribution for PGF proposal: The Manawatu-Whanganui Bio-forestry Alliance lodged by NZ Bio Forestry Ltd.**

Background information or knowledge the Ministry for Primary Industries may have of the organisation and the wider project / proposal that PDU should be aware of.

Grant funding is being applied for to complete a feasibility study to validate, or not, Asian and United Kingdom wood processing technologies using New Zealand pine and eucalyptus wood types for the manufacture of high value plywood.

If the study outcomes are positive, a prospectus (business case) to attract investors is to be completed.

That applicant believes that, if successful, the wider programme could deliver Commercial I jobs and Commercial Informati annual revenues through the establishment of a new, purpose built wood processing site at Marton.
Benefit delivery will be dependent on the outcomes of the feasibility study and the ability of the applicant to successfully capital raise, by way of prospectus (business case).

A $Commerc Grant was previously approved from the PGF for Fomana Capital to quantify log flows and technologies in Asia. This has received media attention recently and includes references to past Fomana funding with TPK: https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12207532

Does the Ministry for Primary Industries consider this proposal will make a positive impact on the achievement of primary industry objectives (or not)? Explain.

1. There is a growing appreciation within the timber processing industry of the value of combining processing activities on a single site (or in near proximity), to:
    a) improve the overall productivity of the operation;
    b) more fully utilise the log resource as it goes through the system; and
    c) Achieve economies of scale, to be more competitive on the international stage.

This proposal has important elements of this thinking, with the development of a plywood mill and the use of the residues in a number of downstream processes (biodegradable packaging, bio-chemicals and bio-fuels). It is suggested that more analysis be put into the value-added potential for the plywood production. In addition to decorative and interior uses, plywood is the base for Laminated Veneer Lumber. New Zealand has several existing LVL plants, and there is increasing use of this product in Commercial Information situations (i.e. multi-storey structural uses and long-span beams).

2. The plywood, and Commercial Information markets have opportunities (as noted in the commentary), but even well-established operators have faced difficulties in recent years. JNL's Gisborne operation was

restructured in early 2018, due to declining demand from the Japanese market for plywood and LVL products, and the plant not having the scale of production to be competitive against new entrants to the industry -https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11980396 It is therefore suggested that more detailed analysis be undertaken of the potential markets for ply production from the plant, and what scale will be required to be internationally competitive over the next 10 to 20 years. It will be particularly difficult for a new entrant to the industry to build markets and product reputation over the short term. It is also suggested that the applicant consider working with an existing operator (e.g. co-locating with WPI's Tangiwa Sawmill or partnering with JNL at their Masterton sawmill and LVL operation). This could help to partially de-risk the hurdles facing a new operator to the New Zealand and international market.

3. The application could be more straightforward if it was broken into two sequential parts – with the research project on the performance of radiata pine as a feedstock for bio-packaging bio-chemicals and bio-fuels and then the business case to establish an integrated plywood and residues operation. The second part of the application is prefixed on a successful outcome from the science, and the technical ability to scale up the operation.

4. It was good to see Commercial In involved in the technical auditing of the proposal, it is not understood as to why their research into bio-plastics, bio-adhesives and composite wood products was not considered as part of the production mix (e.g. commercialising local IP) - https://www.scionresearch.com/science/bioproducts-for-sustainable-industries/bioadhesives https://www.scionresearch.com/about-us/about-scion/corporate-publications/scion-connections/past_issues-list/issue-12,-june-2014/Investment-in-bioplastics-research-pays-off

5. An issue only briefly touched on was the royalty arrangements for accessing the technology. The structure of the royalty payments will affect the long-term economics of the proposal and any upfront licencing payments could affect the cash flow of NZ Bio Forestry Ltd.

6. The application emphasises that they will be looking to utilise all plantation slash. This overlooks the point that the fertility of forestry sites depend upon the recycling of a least a proportion of the slash, needles and debris. Without this nutrient recycling, land owners would be faced (in most cases) with declining fertility and the need to fertilise. It is suggested that the applicant consider assessing what proportion of the slash can be productivity utilised without compromising site fertility, and adding costs to land owners (e.g. an environmental assessment of full and partial residue removal).

7. Previous studies on residue use have shown that there is a relatively steep curve in the economics of transporting low value logs and residues. For a full assessment, NZ Bio Forestry Ltd could provide some of their analysis on the economic hinterland for residue collection and the returns that land owners will receive (across the collection zones).

8. Nearly Comm% of the budget is focused on understanding current regulatory conditions for forestry. This work is unclear, particularly as we now have a national environmental standard, and MPI has been working with councils and the industry to provide clear guidance. The industry also produces guidance (such as the road engineering manual) to assist growers and investors. More detail is required on this area of expenditure, if Crown funds are to be committed.

9. The proposal includes testing of Northland eucalypts for plywood production. With only 600 hectares of eucalypts in Northland this is surprising. The Dryland Forests Initiative has worked with Nelson Pine Industries to test the properties of several eucalypt species for plywood production and gluing. The DFI's experience could be drawn on in assessing what additional work (and species) should be tested.

Does the Ministry for Primary Industries have any other feedback on the viability of this proposal?
The application relates to a high risk, volatile, specialist, capital intensive industry that has a mixed history in New Zealand. Examples of recent mixed timber processing outcomes can be seen at Waverly (Waverly Sawmill to

close) and Gisborne (JNL downsizing).

https://www.stuff.co.nz/business/industries/111014308/shock-in-small-taranaki-community-as-sawmill-closes-and-65-jobs-are-lost

Recommendation:
THAT in order to support this application, further information be requested to include:

- Splitting the application into two distinct parts:
  - Research
  - Prospectus / Business Case
- A [redacted]% cash contribution toward the $[redacted] project cost
- Confirmation of ownership and governance details
- Market validation – market size, value, sales channels, target markets, competition, logistics, labour supply, training, detailed SWOT
- Detailed analysis into the value-added potential for plywood production and the economics of a new greenfield site in the current market conditions
- IP intentions for wider industry
- Analysis of the scale required to compete on the world stage over a 10 – 20 year period
- Validation for funding compared to other Bio Forestry options e.g. points of difference
- Industry partnering opportunities e.g. JNL, WPI
- Confirming of a baseline of existing research and gaps to be addressed in order to avoid / reduce possible duplication of research
- Details of technology royalty arrangements and possible cash flow impacts
- Slash utilisation, residual forest fertility, and nutrient recycling details
- Landowner return details – current v future, in particular the value proposition for iwi interests
- Greater detail of budget spend on regulatory conditions for forestry noting recent environmental standard frameworks
- Additional detail is required on the proposed assessment of Northland eucalyptus species for plywood production (if the proposal is to include a eucalypt focus, consideration should be given to engaging with the Drylands Forests Initiative, who have tested eucalypts for plywood production and are working to build investor interest in key eucalypt species
- Detailed analysis of timber supplies in the region over the next 30 years
- Consent requirements
- Infrastructure requirements relative to current status and future needs e.g. roading, rail, water, housing
- A fully staged programme plan
- A full risk management plan
- Full costing details and how calculated
- Updates on:
  - Market validation trip – November 2018
  - Prospectus status
  - Resource consents
  - Pilot plant
  - Recent PGF funding outcomes

Supporting proposal:	Yes
Appendices:	Yes – Applications and supporting letters are as annexes
Author of paper:	Nick Hough, Investment Director, PDU Investment Team