

# **The Prospects for Downstream Processing of Plantation Hardwood in Tasmania**

**Private Research into the Potential Effects of the Gunns Ltd Pulp Mill  
Proposal on the Tasmanian Community, Comparison with Existing Best  
Practice Pulp Mills and Examination of Potential Alternative  
Downstream Products.**

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## **Executive Summary**

The Gunns Ltd proposal to build and operate a Pulp Mill near George Town in Tasmania has inspired deep controversy within the local community. This report summarises a private individual's attempt to understand key issues surrounding the mill proposal, the approval process, the technology and potential alternatives.

The findings of the research raise serious concerns that the current proposal is not in the best interests of the Tasmanian community and that the approvals process has failed to demonstrate this due to fundamental flaws in the rigour of Government oversight and inadequacies in the chosen assessment processes.

Consideration of the environmental credentials of existing pulp mills has uncovered evidence that challenges the credibility of claims that the Gunns Ltd proposal represents 'world's best'.

Further research into alternative technologies and downstream products has identified that there are alternatives to the proposed pulping technology with reportedly better environmental credentials. Also there are many nascent technologies that use wood as a feedstock for the manufacture of products that have formerly been made from non-renewable sources. This report and the supporting texts indicate that the potential for these products and the smaller scale of manufacturing required for them to be competitive would indicate that they represent a more beneficial downstream processing option for Tasmania.

This report strongly recommends that approval for the Gunns Ltd pulp mill be deferred until an assessment process, that has the confidence and support of the Tasmanian community, is constituted. Also approval should not be given until the future potential of pulp is compared with the novel alternatives that are being developed. In particular, no action should be taken until the Tasmanian state Legislative Council inquiry into Alternative Fuels has incorporated wood based biofuels within its agenda and been given adequate time and resource to fully investigate this subject. Also the State Government should recognise and support the opportunities for high value product streams in its Biotechnology strategy.

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## **1. Introduction**

This report covers an informal assessment of the Gunns proposal to build and operate a Pulp Mill near George Town in Tasmania. Findings are based on research into the proposed processing technology, alternative manufacturing methods and products. Attention is also paid to the assessment process and the effectiveness of the oversight given by the Tasmanian State Government and its agencies.

The imperative behind the research that is embodied in this report came from the damage the mill proposal is effecting on the Tasmanian electorate. Community division is deep and widening. Suspicion and anger are growing fuelled by unconventional assessment processes, aggressive government support for the project and implacable opposition from the environmental movement. The growing polarisation of the debate surrounding the proposal led the author to conclude that prejudice rather than knowledge was unduly influencing opinion.

After several community leaders denigrated a substantial gathering of concerned citizens as being 'misinformed' the author took it upon himself to research issues surrounding the mill proposal and come to a well informed opinion. In doing so the author has become increasingly concerned that the pulp mill proposal may not be the option capable of delivering the best outcomes for the Tasmanian community. These concerns extend to a belief that, to a significant degree, many statements made in support of the mill might be construed as misleading.

For the purposes of this report consideration is given to published documentation that is both authoritative and independent of the mill assessment proceedings. For this reason Gunns Ltd's Integrated Impact Statement (IIS) and Response to Submissions and the consultant's reports by Sweco Pic and ITS Global are acknowledged but not referenced.

The author does not intend this to be a comprehensive assessment of the pulp mill proposal. There is a substantial body of published information available to anyone wishing to educate themselves and a full assessment is clearly not achievable by a private citizen. The intention is to illustrate that an objective inquirer, by giving up some spare time to researching these issues, can readily find information in the public domain, from authoritative sources, that can be used to gauge the appropriateness of the pulp mill proposal and the credibility of statements made for and against it. This report references only a very small proportion of the published data available, however the particular texts referenced have been selected as representative of the current outlook in their various fields.

## **2. Starting Points**

### **2.1. Preconceptions**

The author has attempted to approach this subject as dispassionately as possible, however it would be difficult to approach such a issue without some preconceptions. In approaching the subject matter the author has started with the belief that:

- The forestry industry is an integral part of the Tasmanian economy. It is in the community's best interest to allow for and maintain a healthy and sustainable industry that creates net wealth while respecting all other economic and social activity in the community.
- To ensure that the industry thrives into the future it must be sustainable and flexible. It must also be open to novel, high value processing options.
- Following a sustained period of conversion of native forest and farmland Tasmania now has a maturing resource of hardwood plantation forest. This resource is split between state ownership and private investments encouraged by the Federal Government MIS tax legislation. The existence of this plantation resource is therefore a direct result of government policy at federal and state level. The implication is that both governments have a duty to all stakeholders (the Tasmanian electorate and private investors) to facilitate the maximisation of the return from these plantations.
- The Gunns Ltd pulp mill proposal does not necessarily represent the only realistic option for realising maximum returns to plantation stakeholders or for further value adding in Tasmania.
- This pulp mill proposal has merit but must be weighed against alternative options. Due to the long term commitment of wood supply for the mill it is essential that future options including nascent technologies are evaluated prior to commitment to the pulp mill.
- To best serve the electorate in this and other strategic concerns government and legislators need to be active in eliciting independent and authoritative assessments of markets and future trends. From this, government agencies acting on behalf of the public (i.e. Forestry Tasmania) can be more proactive in determining the most effective downstream processing option for the managed resource.
- Tasmania is currently enjoying a sustained period of economic growth and low unemployment. This is underpinned to a large extent by the growth of Small to Medium sized Enterprises (SME's). There is ample evidence that Tasmania is a 'hot-bed' of entrepreneurial activity. With centres of excellence in research at the University of Tasmania and CSIRO there is no reason why traditional sectors of the economy, such as forestry, can not tap into this innovative energy.

### **2.2. Current Outlook**

From the preconceptions stated above it can be understood that a sceptical and inquiring individual who has been following the pulp mill debate in the media would

come to the following conclusions regarding the project proposal and the assessment processes it has been submitted to.

### **2.2.1. Excessive Haste**

During the development of the pulp mill proposal an impression has been given of undue haste in prosecuting the case for the mill. The timing has more the ring of political expediency than commercial necessity. This impression is formed from the following facts:

- Despite earlier promises to the contrary, Gunns' IIS and government statements have conceded that there will be a significant shortfall between the harvesting potential of eucalypt plantations and the capacity of the pulp mill when commissioned. Rather than scaling the mill capacity or timing the start-up to coincide with the availability of resource the proposal suggests the harvesting of native forest as a stop gap.
- Assessment of the mill against environmental guidelines has been fast-tracked in such a way that the approval process would be completed before either state or federal elections.

The danger of such a rash assessment is that alternatives to pulp will not be adequately researched before a decision is made. If the decision is in favour of the mill then the hardwood plantation resource will be committed essentially in its entirety to a single customer for a single value stream (woodchip and pulp) for well over a generation. This leaves Tasmanian public interest vulnerable to:

- Missing out on future high value processing alternatives (sect 4.1).
- Potentially reduced future returns as margins will be hostage to global pulp price movements.

### **2.2.2. Government Oversight**

To ensure that the interests of all stakeholders, including the wider community, are adequately addressed in any major planning proposal, it is essential that the state government responsible provides for adequate and impartial oversight. There is ample reason to conclude that, in the case of the Gunns pulp mill project, the Tasmanian State Government and legislature has fallen short of these ideals:

- Government ministers have made virtually no attempt to distance themselves from the project proponent, a private company.
- Ministerial statements have made it apparent that the government is essentially dismissive of concerns within the community that the assessment processes have not been sufficiently rigorous.
- Opposition duties in monitoring and holding to account government activities have been lacklustre and ineffectual. The principal opposition party, like the government, has made virtually no attempt to appropriately distance themselves from the project proponent.

### **2.2.3. Democratic Processes**

Democracy is not a default political system. It takes effort on the part of both government and electorate to ensure that democratic ideals are not eroded. Inherent in the systems that uphold democracy are checks and balances that aim to

ensure that special interests are not favoured to the detriment of the wider community. The pulp mill approval process has highlighted several areas within the Tasmanian Government and Public Services where these checks and balances have apparently been seriously weakened;

- The Resource Planning and Development Commission (RPDC) is one such check acting as a degree of separation between legislators and resource hungry private enterprises. The side-stepping of this body and the reasons given are not indicative of a legislature or project proponent that have deep respect for democratic principles. An observer would argue that:
  - If the assessment process was deemed to be slow then it was inadequately resourced by the State Government and the project proponent.
  - The proponent was happy to blame the RPDC for delays while it was itself wilfully tardy in supplying requested data (as revealed in statements by Justice Wright).
  - The RPDC finding that the Gunns Ltd submission was ‘critically non-compliant’ in important areas makes the proponents stated reasons for withdrawing from the process seem less than genuine.
  - The replacement assessment (by Sweco Pic) was hasty and the consultant open to accusations of apprehended bias. In contrast the RPDC process was seemingly open and subject to scientific rigour through peer review.
- Other states have legislated for an additional body responsible for ensuring that appropriate degrees of separation exist between legislators and private enterprises. The Corruption and Crime Commission (CCC) of West Australia is a successful example. Prompted by the events surrounding the pulp mill approval process, authoritative legal figures have indicated that there is a need for such an organisation in Tasmania.
- Professional lobbyists have had a significant presence in the pulp mill approval process. While legislators profess to be immune to their influence it can safely be assumed that private companies would not employ lobbyists if they did not provide significant benefit.

### **2.3. Outlook Summary**

When confronted with the above activities and impressions it is not surprising that a large proportion of the Tasmanian population find that they have substantially lost faith in the process or in the ability of the mill proposal to deliver the benefits predicted by the proponent and State Government.

This scepticism consequently extends to a lot of the claims and statements made in support of the pulp mill proposal. Without rigorous peer review of the assessment and approval process the only outlet for the concerned is to do their own background research. The following sections look at the pulp mill proposal both within the scope of the assessment process and beyond into areas that it is believed should be of concern to a conscientious government.

### **3. The Tamar Valley Pulp Mill. The ‘World’s Best’.**

A constant refrain of the government and backers of the pulp mill has been that it represents the ‘world’s best’ in terms of its environmental credentials. In researching the technology that will be incorporated in the mill, benchmarking the proposal against existing mills and considering alternatives the following issues become apparent.

#### **3.1. Elemental Chlorine Free (ECF) Process [1] [3]**

The central technology of the proposed mill is the ‘Kraft’ process which was invented in Germany in 1884. ECF is the most common technology in use around the world today (approximately 75% of global pulp production) and is characterised by substantially reduced environmental impact compared to traditional chlorine based processes. The proposed pulp mill is designed around the ECF process.

The ‘Kraft’ process replaced mechanical separation of wood fibres with chemical methods. The total energy requirement of the process is substantially reduced and the product quality improved.

Chlorine has traditionally been used as the principle chemical because it is a highly potent reagent that is capable of stripping lignin from the wood fibres and bleaching the resultant pulp with minimum damage. The result is stronger, whiter pulp than can be achieved by mechanical means. ECF uses chlorine dioxide as the reagent and reportedly produces pulp of equivalent strength and whiteness. The benefit of using chlorine dioxide is that it does not generate toxic by-products in concentrations as high as elemental chlorine processes.

In order to produce copy paper of the highest quality with the least environmental impact there is currently no real option to the ECF process. The Gunns pulp mill proposal is consistent with this reality.

Although the most common and highest quality process, the term ECF covers a very broad church with highly variable environmental performance. At the bottom line is the fact that the ECF process still results in highly toxic by-products such as organochlorides and dioxins as well as noxious gasses such as hydrogen disulphide. How effectively these are contained, controlled and disposed of is determined by:

- The design and specification of the mill and process equipment,
- The type of feedstock,
- The design and specification of environmental safeguards,
- The effectiveness of process controls and emissions monitoring,
- The rigour of maintenance practices,
- Local authority emission/effluent standards and the rigour with which they are monitored and imposed.

The assessment process to date has concentrated extensively on the first three of these factors but has left a degree of uncertainty on the latter three. This is particularly disturbing as:



- Environmental protection systems are costly to run and implement. As such they are a burden to any mill operator and without strong regulation and enforcement there is always the temptation to cut corners especially if the mill finds itself trading at marginal profitability.
- CSIRO experts have declared that typically over 90% of noxious gaseous emissions come from leaks in process equipment (so called fugitive emissions). Minimising these can only be achieved by a rigorous and intrusive maintenance program. Little consideration has been given to this in the Gunns Ltd submissions.
- The assessment process has failed to address adequately the mechanisms by which regulatory bodies will be able to monitor the environmental safeguards and ensure compliance. This vital function has been seriously compromised by the Tasmanian government's resort to 'guidelines' rather than statutory limits. Such an approach is generally considered unacceptable in developed economies particularly in the European Union.

### **3.2. Totally Chlorine Free Process (TCF) [1] [3]**

The ECF process is certainly not the only option available to the developers of new pulp mills. Other process chemical mixes can be used including sulphites as a replacement for chlorine though these also are not free from harmful effluent. Perhaps the most promising of the newer technologies is TCF in which combinations of ozone, oxygen and hydrogen peroxide are used.

TCF has a further advantage in that residual chemicals in the paper made from other pulp processes can cause environmental problems at plants that recycle paper products.

When the Gunns Ltd mill was first proposed an undertaking was made to use TCF processes. This was an important promise for the local community as TCF is understood to result in 'cleaner effluents' than the ECF process. That undertaking has since been retracted on the basis that the TCF process is hard to control and not suitable for a mill the size of the current proposal.

These assertions do not match the current reality in Europe and the USA where new mills are being planned and old (ECF) mills are being retrofitted with the TCF process. TCF already accounts for over 7% of global pulp production.

The choice of ECF over TCF for the Tasmanian mill is most likely to have been taken on economic grounds as TCF incurs slightly higher processing costs and sells into a more specialised market. As TCF pulp can not produce paper of the highest whiteness there is a resistance to use it for copy paper except where a premium can be gained from marketing the paper as having superior environmental credentials.

To have discarded the TCF process is concerning as the reasons given would indicate that the proponent has not fully considered both the benefit to either the wider community or future market trends. Specifically:

- Reduced environmental impact and therefore an improved level of support from the community. The phrase ‘World’s best’ would be more credible.
- A TCF mill would have a more unique product. With good environmental credentials it would be more likely to enhance, rather than degrade, the ‘Tasmania’ brand.
- Environmental considerations are increasingly influencing the decision making of people purchasing commodity products such as paper.

### **3.3. Benchmarking the Gunns Ltd Pulp Mill Proposal [2] [3]**

Researching the current state of pulping technology has shown that there are realistic and viable alternatives to the ECF process although with quality, cost and marketing implications. Given that the proponent of the Tasmanian pulp mill proposal has made the judgement to put forward the ECF process it is possible to look elsewhere to see how current operators of ECF mills have acted to mitigate their environmental impact.

Checking the publicity material of current operators generally realises little definitive information to differentiate from the Gunns Ltd proposal. Certainly it is not alone in declaring itself to be the ‘World’s best’.

Published assessments by independent parties are harder to find. Of these one in particular stands out and is worth close examination (especially in comparison with Gunns’ IIS and the Sweco Pic report). This report (reference [3]) was prepared by Access Economics for the operator of a pulp and paper mill in Thailand. This assessment is particularly relevant because:

- The mill uses ‘enhanced’ ECF processes and claims to have established ‘the most environmentally sound paper production method globally’.
- It has taken serious steps to address issues that remain contentious for the Tasmanian proposal. In particular the impact of how the feedstock is grown and harvested, use of public water resource, effluent control and community involvement.
- The report was prepared to benchmark the environmental performance of the mill and to assess whether there would be a commercial benefit to the company in terms of additional sales or a price premium.
- When awarding the contract for the revised pulp mill assessment the Tasmanian government selected a foreign company operating extensively within, and therefore dependent on, the pulp and paper industries. The stated reasons for this selection were that neither a suitable local consultant could be found nor one that was truly independent of the industry. The company responsible for the referenced report, Access Economics, is a highly regarded Australian consultancy with no investment or regular clientele within the pulp and paper industry.
- The report includes a benchmarking exercise that compares the environmental cost, in dollar terms, between the Thai mill and several others around the world (including the Maryvale mill in Victoria).

Particular aspects and findings of this assessment that appear to contrast very favourably against the Tasmanian pulp mill proposal are:

- The Thai mill sources none of its wood from native forest.
- The feedstock (eucalyptus) is grown by local farmers in a manner that complements rather than competes against their traditional food crops.
- The mill's fresh water requirement is met by its own water containment facility. This is aided by the location of the mill in an area of high rainfall.
- There is no toxic effluent discharged into river or sea.

### **3.4. Cost and Quality Implications [1] [2] [3]**

It has already been discussed how the ECF process produces pulp suitable for the manufacture of the highest quality paper. Research into the purchasing priorities of office paper buyers in Australia has shown that cost and quality are the principle deciding factors. The environmental credentials of the paper manufacturer were of secondary but growing concern.

With growing recognition of environmental costs the relative importance of the provenance of commodities such as paper will increase. The popularity of TCF sourced paper in Germany is a clear indicator that nations at the leading edge of sustainable practices are already making decisions that give preference to the cleanest production methods. Australia has traditionally lagged behind Europe in this area, none the less it is clear which way the market for paper is most likely move.

The extended life of the proposed pulp mill means that its future viability will be, to a significant extent, subject to such trends.

### **3.5. Financial Assessment [4] [5]**

The financial modelling for the proposed pulp mill lies within the remit of the proponent as they will be assuming the financial risk associated with such a large investment. The overall risks of the project are, however spread across the community in terms of environmental damage, usage and benefits from forest resources and competing interests for fresh water.

Increasingly, financial assessment of large projects such as pulp mills is subjected to analysis known as triple bottom line accounting. These methods cost out, in financial equivalents, the direct financial returns of the project as well as the cost/benefit balance of social and environmental effects.

Triple bottom line accounting methods are well established in Australia and embraced by leading companies. It has also received support from the Federal Environment Ministry.

If these methods were to be incorporated in the assessment process and then made available for public scrutiny there would inevitably be much greater confidence in the comprehensiveness and impartiality of the approval process.

### **3.6. Competition and Regulation [6] [7] [8]**

One troubling aspect of the approval process has been the scant attention paid to the commercial strength that the wood supply contracts would hand to the proponent. Tasmania is a small state where the degree of competition in any sphere is inevitably limited.

A project the size of the proposed pulp mill will invariably become dominant in its field. This is not an important consideration in terms of its potential to dominate the pulp market for this is a global issue and the mill would represent only a small proportion of total output. It is, however a critical consideration for the local economy because the raw material resource on which the mill would depend is limited. A central aspect of the mill proposal is for long term contracts to be agreed for the supply of wood from both private and public forests. For plantation timber and native forest clearing and conversion these contracts would dominate the forest capacity. In economics parlance the mill would become a 'natural monopoly' in its effect upon its supply chain.

In the past Tasmania has ensured that natural monopolies existed only as regulated government enterprises (Forestry Tasmania, Aurora, Transend etc). To allow an unregulated private enterprise to assume such dominance over a sector of the economy as significant as the forestry industry is both singular and unprecedented. Although most economists think of monopolies in terms of their ability to control the supply and price of their saleable commodity thereby disadvantaging the consumer, the same concerns can be raised when a tradable commodity can only be sold through a single customer only the disadvantage lies not with the consumer but with the supplier.

All economic texts that discuss monopoly situations are emphatic that there is a role for government regulation. In the approval process for the Tasmanian pulp mill there has been surprisingly little indication from the Tasmanian State Government as to how it intends to regulate the supply of timber to the mill. Gunns Ltd is a private company with the prime objective of maximising shareholder returns. Without any clearly articulated regulatory mechanisms there is the potential that the need to satisfy shareholders will come at the cost of reduced value being passed onto suppliers. This raises the following concerns:

- Stakeholders in the Tasmanian forest resource will not have an open marketplace in which to sell their wood. They will not be guaranteed a maximised return for their resource while the mill maintains its dominance.
- The Tasmanian forestry industry is characterised by the existence of many small to medium sized contracting and haulage companies. These businesses will be forced to compete for the business of a single customer. This, by any standards of

competition, is unhealthy and is liable to see the returns of these suppliers reduce to the point of marginal profitability. The implications for the community, secure employment and safe working practices is clear.

#### **4. Alternative Products for Plantation Hardwood**

Throughout the approval process for the Gunns Ltd pulp mill the impression has been given that there is only one downstream processing option for plantation hardwood: woodchips then pulp, paper or board products. This certainly represents by far the greatest proportion of global processing, however there are major changes occurring in other product sectors that show greater long term potential when compared to pulp which is basically a medium to low value commodity product.

Based on the research conducted by the author a range of options have been identified which are already approaching commercialisation. These products carry with them the prospect of ever increasing value because they can replace products made from non-renewable raw materials. Wood is also a 'carbon-neutral' feedstock. The premium that will be attached to renewable, sustainable and carbon-neutral products in the coming age of declining mineral resources and carbon credits is already significant and is destined to grow substantially. In contrast, woodchips and pulp are already mature industries fully serviced by existing capacity and there is insufficient differentiation between pulping technologies to attract significant environmental premium.

Wood is an amazing raw material and given the right transforming technology it can be converted into many products that have previously only been obtained from non-renewable sources. Such products, rather than detracting from, could enhance the Tasmanian 'brand' of 'clean and green' industries.

Organic chemistry and chemical engineering have advanced significantly over the past two decades. Added to the extraordinary recent advances in biotechnology and bio-engineering there is now the capability to take basic organic raw material such as wood and convert it into a wide spectrum of substances, materials and products.

##### **4.1. Replacement of Crude Oil Derivatives [3] [9] [15] [21] [22] [23]**

At this stage the big opportunities lie with the use of wood as a feedstock for the manufacture of products hitherto derived from crude oil. It should be remembered that fossil fuels (oil and coal) are the product of living matter that has been subjected to heat and pressure over geological timescales. With the judicious treatment of wood the time factor can be removed and useful products realised within realistic industrial processing times. Such uses have received strong recognition from the Federal Government Biofuels Taskforce.

All the products discussed below have the potential for strong growth. Commercial advantage will be gained by those producers who enter the market at an early stage. Pulp in contrast is a mature product and returns will be dependent on global spot

prices. These are unlikely to see significant future growth as there is growing capacity for pulp production and a declining market for paper derived from wood pulp:

- Global pulp production has declined over the past 5 years, a period of overall global economic growth,
- Paper production based on wood pulp in 2006 was only 80% of 2005 levels, (chemical wood pulp production fell by 10% in the same period).

#### **4.1.1. Transport Fuel: Petrol and Diesel Replacement [9] [10] [11] [12] [15] [23]**

Throughout the world research into 'renewable' biofuels is gathering pace. Carbon dioxide emissions from vehicle use, security of energy supplies and dwindling oil reserves are becoming key strategic topics. There is a clear imperative to change the environmental footprint attributable to the energy demands of vehicles.

Research into and use of alternatives is already well advanced in the USA, Brazil and parts of Europe. The most common form is E85, a blend of 85% ethanol and 15% unleaded petrol (ULP) which can be used as a replacement for ULP with some modification the vehicles fuelling system.

To date the majority of ethanol has been derived from commercial crops such as sugar cane and maize. This however detracts from food production and requires considerable energy input from farm machinery and chemicals to produce. As a result wood is gaining momentum as an alternative and is being pioneered by countries like Sweden where government incentives are being used to encourage the development of processes that convert forest waste products into ethanol.

Commercially viable wood to ethanol (ligno-cellulosic conversion/fermentation) processes are still a few years away. However, the inexorable rise of oil prices, increasing 'greenhouse awareness' and the rising cost of net carbon emissions, combined with improving technology will make this an increasingly viable and valuable use for plantation hardwood.

The use of wood as a renewable feedstock for vehicle fuel is not limited to internal combustion engines. The most likely replacement to power vehicles, into the long term future, is the fuel cell electric system. This system requires a high energy density fuel capable of releasing elemental hydrogen. Ethanol or a close derivative should be suitable for this purpose.

The technology for converting wood to vehicle fuel is still young, however there is a lot of research funding being directed this way indicating a high level of confidence worldwide that it will be a vital part of the future energy mix. This research is already starting to link plant derived ethanol with other forms of renewable energy to enhance the resulting economic, social and environmental benefit.

#### **4.1.2. Biomass for Power Generation [9] [14] [15] [20] [21] [23]**

Tasmania's 'zero emission' hydro-electric power generation capacity is overloaded requiring extensive supplementary use of fossil fuel generation at Bell Bay and mainland power stations (via Basslink).

Thermal generation using biomass from harvested forest is already a reality in parts of Europe where low value farmland has been given over to trees such as willow for coppice harvesting. Eucalypt is also an acceptable feedstock both as a solid fuel (pellet) and as biogas from a process known as gasification.

The use of biomass as a fuel source is sufficiently well advanced in Europe that wood pellets (a replacement for coal) are traded internationally. Reports show the clear expectation that this trade is set to grow substantially.

Under Mandated Renewable Energy Target (MRET) legislation Tasmanian generators using biofuels would qualify for renewable energy certificates. Under commitments made by both the Federal Government and Opposition MRET levels are set to increase and the value of renewable energy certificates will rise accordingly.

#### **4.1.3. Other Oil Derivative Products [9] [15] [22] [23]**

The conversion of wood into products derived from crude oil has been driven by the need to find future renewable energy sources. In establishing the capability of this technology a Pandora's Box of opportunity has been opened. The world economy is currently dependent on a host of materials derived from oil. Plant material (biomass) is increasingly being considered as an alternative feedstock for these. Examples of very high added value products are:

- Plastics
- Paints
- Pharmaceuticals
- Adhesives

Indeed, if it can be made from oil there is a good chance that it can also be made from wood. Compared to commodity products such as pulp and fuel these have much higher added value potential. By comparing figures in the researched texts it can be estimated that, even at low yields, the ability of these products to add value and generate wealth substantially exceeds that of pulp. The market is also huge with sales of such oil derivatives in the USA alone reaching US\$375bn in 2005.

Based on figures available in the researched documents it is possible to estimate the relative potential value of one input tonne of wood when converted into some of the above mentioned products. (See graph below).

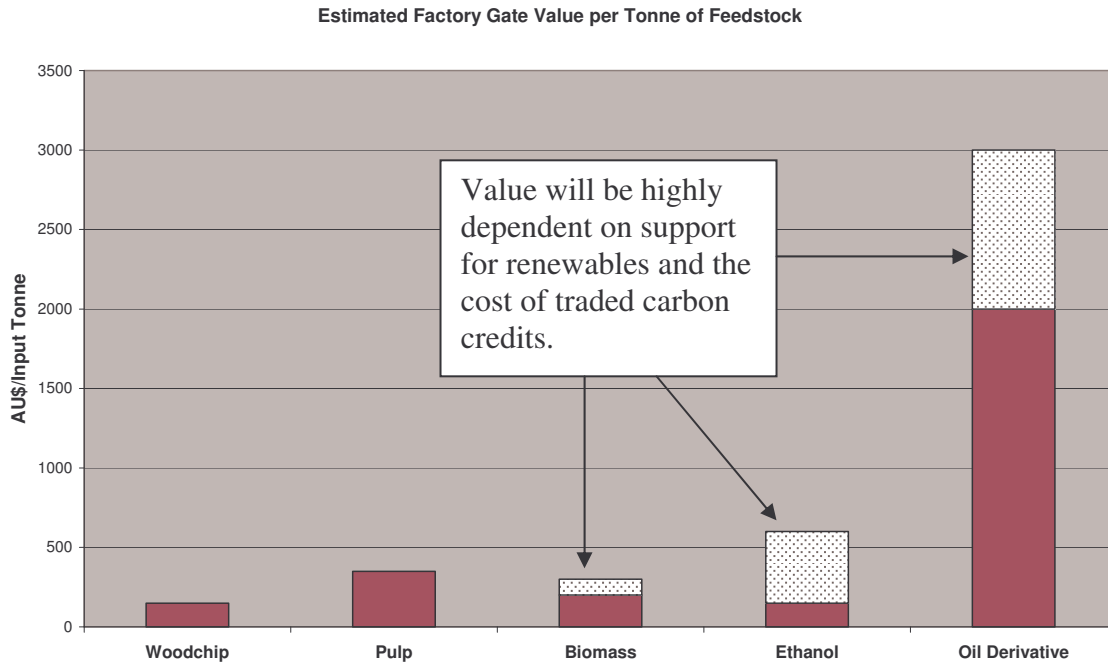
Biotechnology is recognised as a key growth industry in Tasmania with an excellent record of growth and innovation. It has the ability to play a pivotal role

in engineering a future for high value forestry products as well as maximising the sustainable yield of plantations.

#### 4.2. Other Value Streams and By-Products [9] [14] [15] [16] [22]

Another potential use for wood products is as a soil conditioner and slow release fertiliser. This is produced by grinding down the wood, or taking waste products from some of the above processes, and using this as a base for a composting mix. The resulting product can restore the organic matter in depleted soils increasing the fertility and capacity for water retention. There is great potential for such a product where land clearing followed by intensive farming in low rainfall areas has left the soil infertile or only usable with extensive irrigation and heavy use of chemical fertilisers.

If wood is seen as a multi-use raw material, like crude oil, then flexible processing can take advantage of many value streams and by-products. Such businesses are much more adaptable to future changes in the market than large scale, single-product industrial concerns such as pulp mills.



Note: Yield rates are estimated on the conservative side. Ethanol (50%), Oil Derivatives (<25%).

#### 5. Combining a Plurality of Options: The ‘Biorefinery’. [16] [17] [18] [19]

As discussed above, advancing technology has enabled researchers to consider wood as a multi-use raw material. This paradigm taken to its natural conclusion is embodied in the concept of the ‘biorefinery’. This concept treats wood in the same manner that petro-chemical companies treat crude oil. By combining a range of conversion technologies the



raw material can be broken down into its constituents and directed off into a multitude of product streams. This both maximises the value added to the wood and protects the processor from price/demand fluctuations in any one product stream.

In parts of the USA there are serious attempts to tap into the depth of expertise that already exists within the forest products industry and combine this with the processing skills of the petro-chemicals sector. The vision arising from this starts with a 'Kraft' type pulp and paper mill and adds a variety of processing streams to form a multi-product hybrid where paper is but one of many renewable and biodegradable products. This vision has received substantial support from legislators at Federal and State level in the USA and is actively supported by the Department of Energy (DOE).

## **6. Summary of Findings**

Based on the findings of this research the author is forced to conclude that the Tamar Valley pulp mill proposal qualitatively fails to make a sound case for approval against all three of the evaluation categories embodied in triple bottom line accounting.

The proposal also fails to consider the potential to maximise the return of Tasmanian plantation hardwoods by evaluating alternative high value product streams.

### **6.1. Economic**

Forestry holds, and should maintain, a strong place in Tasmania's economic activity. To maximise the potential return to stakeholders from native forest and plantation and to ensure an active and evolutionary future this industry must embrace:

- Product variety to secure against the price fluctuations inherent in a single commodity which is subject to intense global competition.
- An open and effective competitive market for raw Tasmanian timber resource featuring a plurality of downstream processors. Alternatively robust government regulatory mechanisms must be in place to ensure that returns to stakeholders of forest resources and contractors are maximised.
- Long term research, ideally funded by government agencies, to identify and adopt emerging technologies that will put and keep Tasmanian forest products and biotechnology at the high value 'leading edge'.

### **6.2. Environment**

The choice of Elemental Chlorine Free (ECF) technology for the mill puts it close to the leading edge of processing methods capable of realising the highest quality pulp at lowest cost and reduced environmental impact.

Tasmania was, however, promised the 'world's best' in terms of environmental performance. Research would indicate that this is not a credible claim. Furthermore two issues are raised that do not appear to have been adequately dealt with by any of the assessment reports authorised by the Tasmanian government or Gunns Ltd:

- Assessment by a respected Australian consultancy, that is independent of the forest products industry, has shown that an existing ECF pulp and paper mill in Thailand apparently has environmental credentials that already exceed the standards expected of the Gunns Ltd proposal. To meet the standards of the Thai mill would seemingly require a change in raw timber sourcing plans and much more extensive effluent treatment than currently specified.
- Initially the Gunns Ltd proposal indicated that the mill would use Totally Chlorine Free (TCF) processing technology that is reputed to have substantially lower environmental impact than the ECF process. To explain the change Gunns Ltd indicated that the technology was immature and difficult to control. This position contrasts with global trends:
  - TCF is extensively used and currently accounts for approximately 7% of global pulp production.
  - Germany is the principle consuming nation for TCF derived paper products. Many low environmental impact products find initial market acceptance in Europe before gaining wider acceptance.
  - TCF pulp does not produce paper with the same degree of whiteness as ECF pulp, however this perception of lower quality is likely to be overcome by the 'green' premium.
  - A TCF mill is likely to be less damaging to the broader Tasmanian economy particularly those sectors trading on the state's clean image.

### **6.3. Community and Social**

The current pulp mill proposal is devaluing key pillars of Tasmanian social capital. This erosion will increase substantially if the project, in its present form, is allowed to proceed. The concerning aspects are:

- **Community leadership:** The deep divisions that have been formed within the Tasmanian community stand to hold back social and economic progress:
  - Social divisions generate prejudice. Prejudice is easier to manipulate than informed opinion.
  - The Tasmanian government is no longer communicating vision and demonstrating leadership in a manner that will promote social cohesion.
  - The government is preaching to, and relying on, the prejudices of one sector of the community to provide it with a mandate. This is further cementing the divisions.
  - The mill, if built, will be the subject of considerable resentment within the community. This will restrict its ability to operate smoothly and recruit freely.
- **Statutory Oversight:** Individuals have limited influence over large commercial interests. Protection for the individual and communities relies on checks and balances legislated for, and applied without prejudice or bias, by Government. When Government fails to uphold due process a loss of faith and an increase in dysfunction occurs within society.
- **Foresight and Oversight:** It is apparent to much of the Tasmanian community that these key roles of government have been applied weakly in determining the most

appropriate use of the state's forest resources. A key objective of good governance in a democracy is to have:

- Foresight: The desire to gather knowledge that will enable more informed determination of future directions and highlight nascent technologies and trends that might complement such vision. In doing this, to engage with and benefit from the human capital present in educational and research institutes.
- Oversight: To ensure best outcomes for the electorate, government should provide objective and dispassionate oversight of the interaction between society and private enterprise. This fails if any vested interest is believed to have undue influence over legislators. In such instances it is the job of opposition parties (and bodies such as the CCC in West Australia) to hold government accountable.
- In small economies where large enterprises can dominate (monopolise) a natural resource, oversight of the enterprise must be robust and auditable. The use of guidelines and permits is clearly inadequate where the state does not have the resource or will to monitor and ensure compliance.

## **7. Conclusions & Recommendations**

This report demonstrates that research of available authoritative literature does not support fundamental claims made by the proponent of the Tasmanian pulp mill project by indicating that:

- The processing technology proposed does not necessarily represent the best in environmental performance.
- Existing mills have been assessed to have apparently better environmental performance than is claimed for the Gunns Ltd proposal.

Furthermore the literature clearly indicates that there are other options for the processing of Tasmanian hardwood resources that could realise greater benefit to the state. These options will be closed off if any long term contracts are issued for supply of timber to the pulp mill.

- Wood to ethanol plants are already in operation providing a renewable alternative to vehicle fuel.
- Replacements for high value oil derivatives are becoming clear options for wood processing. Realisable value per input tonne is expected to be very substantially greater than is achievable for pulp.
- Plants making renewable replacements for oil derivatives tend to be smaller and cheaper to build than a pulp mill. This would allow for a variety of value streams and continued entrepreneurial activity.
- Tasmania has a well developed and innovative Biotechnology industry. The skills and entrepreneurial energy already developed, combined with the island's plantation resource, could yield a truly 'world leading' set of high value industries

Finally this report highlights the social and economic costs that would be borne by the community should this project receive hasty approval.

- Approval of the Gunns Ltd pulp mill project would result in a monopoly being created that could commercially disadvantage all stakeholders in the forestry supply chain.
- The Tasmanian Government has limited experience in providing appropriate regulation of, and applying enforcement measures to, private monopolies.
- The role of the State Government in providing objective oversight seems to have been substantially compromised.
- Public confidence in the approval process is low and declining. The Tasmanian Government has, in the public perception, failed to maintain the integrity of State mechanisms.
- Allowing deep divisions to be created within the community results in a society without cohesive vision or aspirations. A legacy will be created that will hold back both economic and social development.
- Identifying and supporting processing options that could complement Tasmania's 'clean and green' image would be a basis for regaining broad community support.

As a result of this research, it is firmly believed that the Gunns Ltd pulp mill approval process should be halted immediately and not be progressed further until the following recommendations have been implemented:

- An independent committee of scientific and economic experts should be formed to evaluate the possible alternatives to pulp. Community benefit must be apparent in the assessment and it is recommended that Triple Bottom Line accounting methods are employed.
- The Gunns Ltd proposal should be benchmarked against existing mills by an independent consultant. This to be conducted as part of a review of the approval process by the RPDC and subject to Triple Bottom Line accounting methods.
- An independent Judicial Review be undertaken into:
  - Mechanisms for ensuring objective government oversight of large development projects involving private sector proponents.
  - The effectiveness of Tasmanian State monitoring and enforcement capability in regards to the regulation of private monopolies.

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[ ] Description

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