

TASMANIAN FUTURES:
DESIGNING AND
IMPLEMENTING AN
INNOVATION STRATEGY
Launching a Food Industry Strategy

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Tasmanian Futures: Designing and Implementing an Innovation Strategy
Launching a Food Industry Strategy

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Introduction

In this chapter we explore the reasons Tasmania might choose to focus more intensively on developing the food industry. We examine its size, evidence of enduring competitive advantage and its potential to create significant value for Tasmanians relative to other industries over an extended period. We then examine the key characteristics and innovation dynamics of the food industry and explore why the industry might not have contributed more to Tasmania's prosperity to date - before outlining how the significant unfulfilled potential of the food industry might be unleashed.

The picture of a strong, productive, growing and resilient 'high-impact' food industry is not to say other industries are not important or that they won't emerge to become much more valuable in the future. Hot rocks and other renewable energy technologies may propel that industry (and the related energy intensive sectors) forward in a significant 'step' change in time - once the relative price becomes more competitive with less clean and higher CO₂ emitting energy - and the pulp mill will make a significant one off boost to growth (including in its supplier industries) should it be built.

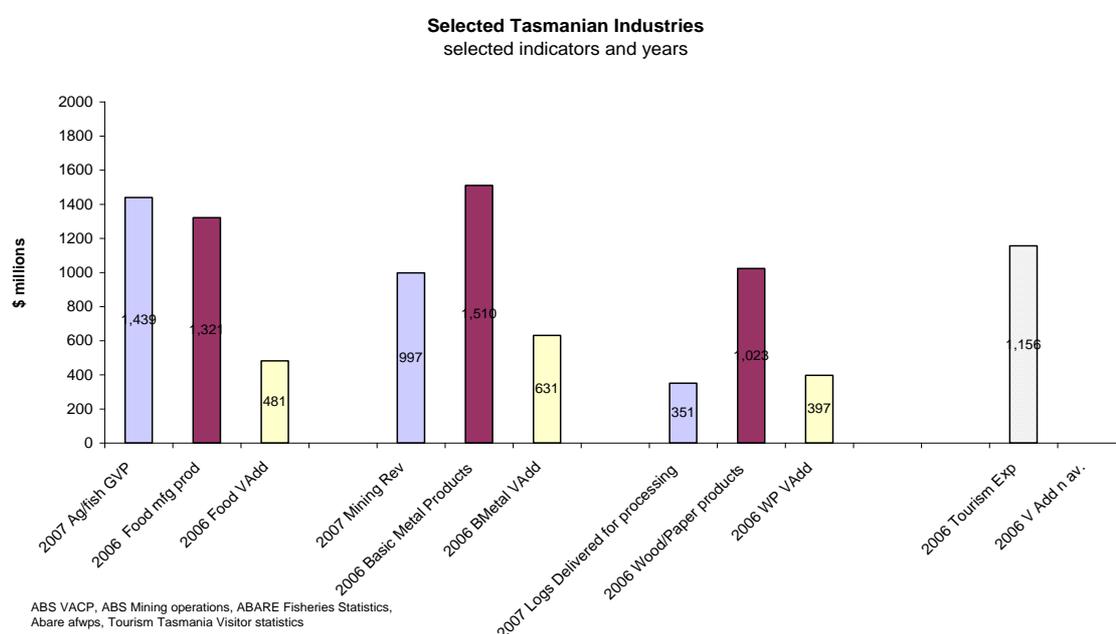
In this chapter we summarise key aspects of a framework and principles for developing innovation policy developed by Jonathan West and outline his innovation strategy for the food industry as it stands at this point in time. Innovation in the food and other industries is a continuing journey and cannot be captured in a static 'document'. The ideas and policy outlined here will continue to be shaped by learning and further and more detailed information and analysis and as circumstances change here, nationally and internationally

Jonathan West makes the case that that lifting Tasmania's prosperity by the largest amount possible calls for innovation policy that focuses on supporting productivity advance in sectors that combine sufficient economic weight to matter with high growth potential and competitive advantage derived from 'deep' capabilities – those that are the most difficult to emulate.

First, we examine indicators of relative performance of key industries and look for more detailed evidence of *revealed deep capability* – reflecting the core advantages that are the most difficult for other places to harness or

create. Second, we identify unfulfilled potential in Tasmania’s food industry based on its revealed deep capabilities and compare and contrast that with the potential of other key Tasmanian industries. The early evidence suggests that Tasmania has a significant area of arable land that is suitable for higher margin agricultural uses – and we attempt first *indicative* estimates of unfulfilled potential. Finally, we explore interventions that complement, not substitute for or compete with, the activities of private sector and that strengthen the market position and capabilities of private firms in the food industry.

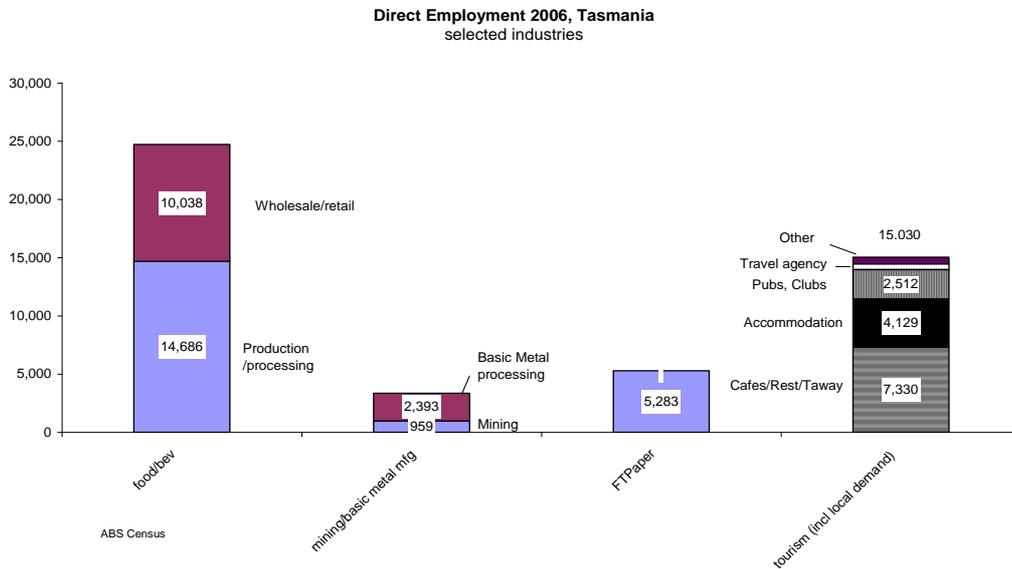
Tasmanian industries that can claim to be both large and competitive include forestry, timber and paper products, energy and its intensive user industries, tourism and the food industry.



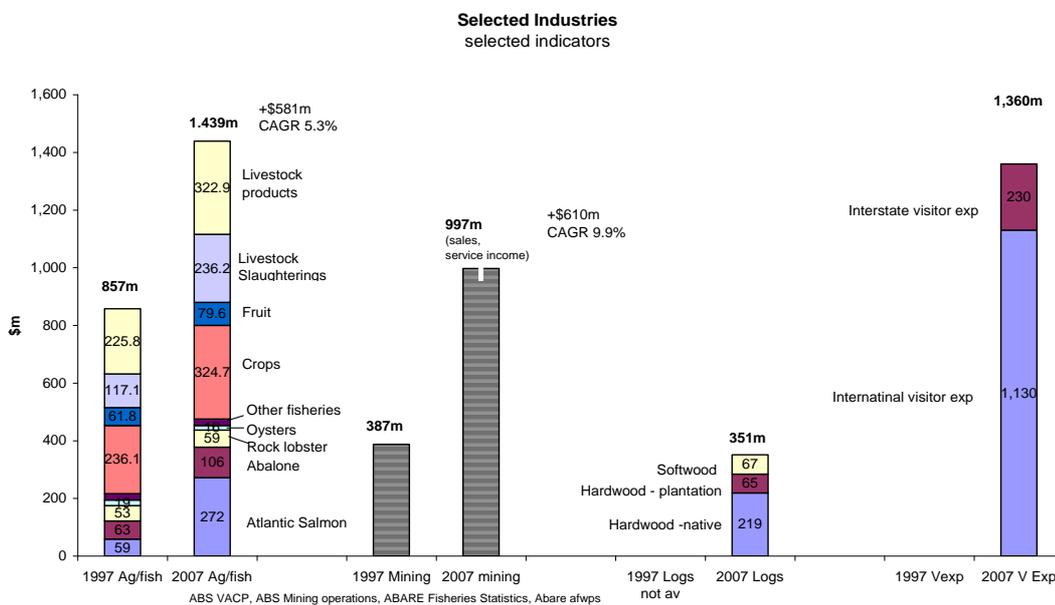
Of these the food industry is clearly the largest by a significant margin. The gross value of Tasmanian agricultural and fisheries production in 2007 was around \$1.5billion (farmgate value) significantly greater than mining revenue of \$997m and massively greater than revenue from logs delivered for processing \$351m.

The relative size of agriculture and fishing is more impressive considering that a ‘boom’ in commodity prices was the primary factor that contributed to a more than two fold increase in the value of mining between 2004 and 2007 (\$462m to \$997m). In the processing sector the high value of basic metal products reflects the large spike in metal prices that contributed around \$200m to basic metal products revenue between 2003 and 2006 (volumes changed little).

Adding an employment dimension to the picture confirms the relative importance of the food industry, particularly after considering that a greater proportion of industry employment is attributable to local demand in tourism (spending not related to interstate or international visitors) than local demand in the food, mining/minerals and forestry, timber and paper sectors.



The figure below shows that growth in agriculture/fishing over the medium term has been relatively strong and broad based.



In the ten years to 2007 the gross value of agriculture and fishing production increased significantly in absolute terms (\$581m nominal) and percentage terms CAGR 5.3 per cent. While the CAGR of 9.9 per cent for mining looks impressive at first glance, around \$535m was added to the gross value of mining between 2004 and 2007,

primarily as a result of the spike in mining commodity prices – that have now collapsed to around long term trend (at best).

The nature of deep capabilities

Jonathan West explains that ‘deep’ capabilities are those aspects of the economy that are difficult for others to emulate and that support ongoing gains in competitiveness. Three characteristics of economic capability are of particular interest in the present exercise:

In their traded sectors, economies tend to specialise. They concentrate in the fields in which they have acquired or built deep capability. Products and services from these sectors in a particular geography can generally out-compete those from others. While all developed economies include large and relatively similar proportions of non-trade-exposed sectors—health, education, community services, security, home-building, retail, personal services—in their traded sectors, economies can be remarkably concentrated. And the traded sector is especially important, for two reasons: first, non-traded sectors generally grow only roughly in line with demographics (population and per capita income), whereas traded sectors can generate far greater expansion as they tap distant and overseas markets. Second, in a modern economy, especially a small one, many of the goods and services citizens want can be obtained only from afar; generating the income to pay for these imports depends on what the community can sell to the world. The economic fate of small communities such as Tasmania can thus rest on a surprisingly narrow base of capability in very few fields, and sometimes as few as one. Ensuring the long-term strength of these sectors ought to be a high priority for any community and its government.

Capability is commonly geographically concentrated. Successful industries show a marked tendency to cluster in quite small regions. Such clusters include famous names like Silicon Valley in California or the London City and Manhattan in finance, but also such less well-known locations as Aalsmeer, 10 miles southwest of Amsterdam, the global cut-flower trading capital (with 60% of global trade),¹ or Surat, Gujarat, India which cuts 92

¹ Felix Oberholzer-Gee, Vincent Dessain, Daniela Beyersdorfer, Anders Sjöman, ‘Bloemenveiling Aalsmeer’, *Harvard Business School Case*, 2006.

per cent of the world's diamonds.² Capability concentrates regionally because much of the basis for capability within firms exists and is maintained *outside* firms, in educational and research institutions, finance, local industry and community bodies, support and allied service industries, and community memory. The combination of these elements can be thought of as the local platform for innovation, and the health of these platforms is a vital interest to the future of these communities.

Capability assumes different forms, and is created by different processes, in different sectors. Capability can be thought of as the ability to perform tasks that matter in competition, and what matters in competition varies industry by industry.

The combination of these three observations generates an important implication: to be effective in promoting productivity advance through innovation, government policy must focus on sectors in which the economy specialises, and be geographically and sectorally specific. There is no one-size-fits-all innovation policy.

Revealing Tasmania's deep capabilities

Analysis to locate sectors in which the Tasmanian economy specialises is a matter of identifying those parts of the Tasmanian economy that account for a disproportionately large share of Australia's activity (economic output, value-added, employment, and trade) in a given field. Understanding the source of capability that might underlie such specialisation requires deeper investigation into how physical, human, organisational, and financial factors combine to impart an ability to perform the tasks that matter in that sector.

By 'disproportionate' we mean here those sectors that *account for a substantially greater share of economic activity in a given field than Tasmania's average share of Australia's population or economy.* Since Tasmania accounts for 2.3 per cent of the Australian population and 2.0 per cent of the Australian economy, sectors of particular interest will be those in which Tasmania accounts for a much greater proportion of Australian activity.

² Aravind Adiga, 'Uncommon Brilliance', *Time* magazine, April 12, 2004, from Time.com, retrieved 3 November 2008.

It is important to stress two issues in presenting this analysis: first, and rather obviously, the Tasmanian economy is small. It is less than one-tenth the total size of the city of Sydney, indeed it is equivalent to only few suburbs of Sydney and it is by far the smallest of Australian states. We should not expect, therefore, to identify a large number of fields in which Tasmania's economy is concentrated. Second, and largely as a result of the first issue, data on industry size in Tasmania are poor—privacy and sampling considerations dictate that data at a granularity that would be available for a larger economy are simply not so for Tasmania.

Nonetheless, the principal features of the Tasmanian economy are clear. Some contradict conventional wisdom in Tasmania. Using employment share as a proxy for share of economic activity, in its traded sector Tasmania enjoys a disproportionate share of only three industry sectors: forestry and associated activities; food, including agriculture; and electricity and mineral processing derived from electricity generation. Summarising this analysis, features of the Tasmanian economy particularly relevant to innovation are:

Tasmania is a significant food producer.

Tasmania enjoys a substantially disproportionate share in several key food categories: aquaculture (20.9%), fruit and vegetable processing (13.3%), dairy farming (8.8%), fishing (8.7%), dairy product manufacturing (5.8%), 'other' food manufacturing (4.6%), bakery products (3.5%), horticulture and fruit growing (3.3%), services to agriculture (3.3%), grain, sheep, and beef (3.2%), agriculture 'not further defined' (3.2%), and farm produce wholesaling (2.4%). In 2005-06, food processing accounted for 29% of jobs in Tasmania's manufacturing sector, the highest proportion for any state, and with a higher Industry Value Added (IVA) than the Australian average (21% versus 18%).³ And the sector is growing, not declining; between 1990 and 2005, the ABS category 'Agriculture, Forestry, and Fishing' increased its share of the Tasmanian economy by two percentage points, and between 1990 and 2000 grew by an annual average 7.4% versus 3.1% for Australia (although in the period 1999-2002 to 2003-06 the sector declined marginally due to drought). Between 1990 and 2005, agriculture alone increased its Real Gross Value in Tasmania by 50%.⁴

³ Australian Bureau of Statistics (ABS) 2007, Labour Force, Australia, Detailed, Quarterly, May 2007, Cat. No. 6291.0.55.003.

⁴ ABS. Cat. 52220.0

Some analysts argue that Tasmania's unusual concentration in these food sectors is a weakness. They suggest that these are 'mature', low-technology, and low-productivity sectors, with poor growth or improvement prospects. Hence, it is frequently claimed, Tasmania ought either attempt to transition out of these sectors, or focus on building other, more dynamic industries that are likely to support future productivity and growth.⁵

On closer examination, however, none of the above claims turn out to be supported by data.

Food is not a low-growth or 'mature' sector. Globally, the food sector has grown over the last decade faster than other parts economy, and than the economy as a whole. This is because a large proportion of the world's population, especially in China and India, is finally earning sufficient income to enjoy the diet they would like—one with a greater share of protein and high-value foods and less simple carbohydrates. As noted above, the food sector has also grown faster in Tasmania than the State's average. Indeed, in recent years regions strong in agriculture have enjoyed unprecedented prosperity, as rising consumption and limited capacity to increase output have reduced stock-to-use ratios and driven up prices. The Innovation Census of Tasmania found that 70 per cent of food-sector firms increased sales in the period 2004-2006, with an average growth over the two-year period of 65 per cent and median of 37 per cent, and food-sector employment growth averaged 66 per cent with a median of 33 per cent. Importantly, the Census also found that exports out of Australia accounted for 41 per cent of Tasmania's food sector sales and sales to mainland Australia a further 39 per cent. By comparison, for the overall economy sales *within* Tasmania accounted for 64 per cent.

Food is not a low-technology sector. While it is true that the product often appears little changed, the systems used to produce, trade, distribute, and process these products are highly complex and the activities needed to produce and sell them are increasingly knowledge intensive. The sophisticated services needed to construct and maintain these systems make up a major proportion of value creation and employment in and around the food sector. As a result, and this is one piece of evidence for the increasing knowledge intensity of Tasmania's food and

⁵ See, for example, Courvisanos J. 1999, 'Region in Transition: Schumpeterian Road to Recovery in Tasmania', *Journal of Economic and Social Policy*, Vol. 4, No. 1, p45-62, and Australian Government Bureau of Infrastructure, Transport and Regional Economics, *A Regional Economy: A Case Study of Tasmania*, Report 116, November 2008.

primary sectors, the food sector has been generating a disproportionate share of higher-skill jobs. The two categories of occupation that grew at a faster rate for agriculture in Tasmania than for the average of all Tasmanian industries were 'Professionals', and 'Intermediate Clerical, Sales, Service Workers'. The number of 'professionals' in agriculture grew by 29.8% from 1996 to 2006, but 17.6% for the overall economy; while the number of 'intermediate clerical, sales, and service workers' in agriculture grew by 32.7% from 1996 to 2006, but 21.3% for the overall economy. Over the same period, the number of 'labourers and related workers' increased by only 1.3% for agriculture, forestry and fishing, but by 12.2% for all industries, and within this period—from 2001 to 2006—decreased by 5.5% for agriculture, forestry and fishing, and increased by 8.8% for all industries (the 10-year figure for agriculture was offset by a 7.3% increase in the first five-year period).⁶

The perception that food is 'low tech' is an unfortunate artifact of a commonly employed definition of low-, medium-, or high-tech, which simply measures the ratio of R&D-to-sales in the industry, classifying those with greater than 4% 'high' tech, those between 1% and 4% 'medium' tech, and those with less than 1% 'low' tech. But this taxonomy can be misleading: it fails to recognise either that much innovation (indeed, in most industries, more than two-thirds) does not stem from R&D, or that in many industries, including very often food, R&D is performed not *inside* the firm, but *externally* by not-for-profit researchers, whether government or other, and then adopted by firms, and is therefore not counted in the statistics. The Innovation Census of Tasmania showed that 71 per cent of innovation expenditure in the food industry was non-R&D-related, but that external acquisition of R&D accounted for 31% of R&D expenditure, versus 8 per cent for the overall economy. Indeed, while the food sector accounted for 4.3 per cent of total innovation expenditure in the economy, it made up 16.4 per cent of external acquisition.

Food is not a productivity laggard. While during the 1990s productivity advance in the Australian economy as a whole averaged 2.7% and during the 1980s 1.5%, the leading productivity-advancing sector was 'communications' on 5.5%; agriculture, far from being a laggard, came in a close second, on 5.4%. This finding was confirmed in the Innovation Census, with 79 per cent of food sector firms reporting that they innovated during the previous year, significantly higher than the average for the overall economy, and that most innovation was productivity-enhancing process related. Tasmanian food firms also reported that they were collaborating to raise

⁶ Australian Bureau of Statistics, Census data, 1996-2006.

productivity with external consultants, commercial laboratories, or private R&D institutes, universities or public-sector research entities at a higher rate than the average for the overall economy (50 per cent versus 35 per cent).

In short, a concentration in food is not a disadvantage for Tasmania, but a potential advantage. Tasmania has accumulated substantial strength over several decades in an industry now characterised by above-average growth, especially globally, considerable knowledge intensity, and sustained above-average productivity advance. However, past performance is not sufficient. We now seek to establish if the food industry has the potential to create a significant lift in prosperity on an ongoing basis.

Food has significant unrealised potential

While the analysis above shows clearly that the food and agriculture industries are already substantial contributors to Tasmania's economic well-being—indeed taken together and by several measures they are the largest contributors—they have the potential to generate far more. The two keys to unlocking this potential are facilitating a transition from lower-value land use to higher-value, and the further construction of food-processing and consumer-product development companies. These might be thought about as the 'back end' and the 'front end', or the upstream and downstream of the food chain. Both these are feasible, but they are by no means inevitable if left to their own devices. Taking the 'back end first', we look for evidence that Tasmania has unrealized potential and then explore what the full potential for Tasmania might be.

South East Tasmania's unrealised agricultural potential

The South East of Tasmania (defined by the districts of Kempton, Elderslie, Brighton-Broadmarsh Tea Tree-Bagdad, Coal Valley and Sorell-Orielton) is a stark and robust example of a region capable of generating significantly more value by transforming more of the region from lower value to higher value agricultural land uses.

In 2002 the maximum irrigable area of the region (as defined above) was estimated to be 48,700 hectares, of which only 4000ha, or 8.2 per cent, was irrigated. More importantly, 14,300 ha of the total irrigable area were found to be capable of supporting higher value horticulture such as apricots and cherries if irrigation was available. Around 6,900 ha of the 14,300 ha was suitable for wine grapes.

Maximum Irrigable Area - Hectares

Sub-District	Intensive Horticulture	Additional General Cropping Land *	Additional Pasture Land **	Total
Kempton	1,900	1,200	1,200	4,300
Elderslie	300	1,700	1,000	3,000
Brighton-Broadmarsh	700	2,600	2,600	5,900
Tea Tree-Bagdad	2,300	3,000	2,200	7,500
Upper Coal Valley	2,000	4,200	2,300	8,500
Lower Coal Valley	4,200	3,800	1,600	9,600
Sorell-Orielton	2,900	5,000	2,000	9,900
Total	14,300	21,500	12,900	48,700

* 100 % of Class 4 land (excludes Class 4 land with stone fruit and grape potential)

** 60% of Class 5 (excludes Class 5 land with stone fruit and grape potential)

Source: Table 4.5 Water Resource Options Development in South East Tasmania, Volume 1, DPIWE 2002

A key insight from this example is that significant unrealised potential becomes apparent *not* by viewing land capability through the constraining prisms of drought-proofing and/or expanding lower margin agriculture - and instead – by analysing the highest value uses for the land taking into account soil, climate and other constraining factors. For example high value horticulture is suited to many of the more abundant soils that are least suited for annual cropping (particularly class 4 and 5 soils) - if issues such as water, frosts, drainage and other limiting factors can be overcome.

To explore what the full potential for Tasmania might be, we have constructed a first *indicative* estimate of feasible potential for Tasmania based on the development and growth of the food industry.

An indication of Tasmania's food industry potential

Table 1 provides very rough estimates of the feasible potential for selection of key agricultural commodities in Tasmania's future.

Table 1: Agriculture and aquaculture potential value increment estimates

Agricultural land use and irrigation scenarios - Tasmania (not including processing or packaging)	Sheep	Beef	Dairy	Medium value[^] Horticulture	Wine	High Value[^] Horticulture	Total
Gross margin \$ per Ha	\$150	\$225	\$2,000	\$5,000	\$24,000	\$60,000	
Current irrigation and land use	ha 600,000	600,000	87,000	20,000	1,000	368	1,308,368
Gross margin	\$ 90,000,000	135,000,000	174,000,000	100,000,000	24,000,000	22,080,000	\$545,080,000
Current irrigation with optimal land use	ha 590,000	590,000	100,000	30,000	5,000	10,000	1,325,000
Gross margin	\$ 88,500,000	132,750,000	200,000,000	150,000,000	120,000,000	600,000,000	\$1,291,250,000
Feasible irrigation with optimal land use - Low adoption	ha 550,000	550,000	150,000	40,000	20,000	30,000	1,340,000
Gross margin	\$ 82,500,000	123,750,000	300,000,000	200,000,000	480,000,000	1,800,000,000	\$2,986,250,000
Feasible irrigation with optimal land use - High adoption	ha 510,000	510,000	200,000	50,000	35,000	50,000	1,355,000
Gross margin	\$ 76,500,000	114,750,000	400,000,000	250,000,000	840,000,000	3,000,000,000	\$4,681,250,000
[^] High value - eg cherries and apricots; Medium value - eg poppies							
Fisheries and Aquaculture scenario (not including processing or packaging)	Wild fish	Other Aqua *	Salmonids				
Gross Value Production (GVP) 2006-07	\$ 180,193,000	23,414,000	271,823,000				
GVP 2015+	\$ 180,000,000	250,000,000	530,000,000				
Gross margin (at 50% of GVP) 2006-07	\$						
Gross margin (at 50% of GVP) 2015+	\$						

* including new species

These data illustrate three scenarios:

1. Existing land use, with existing irrigation.
2. An 'optimised' land use, with existing irrigation.
3. An 'optimised' land use, with feasible additional irrigation, at two levels of land-use transition: high and low.

By ‘optimal’ land use we mean a shift to higher per-hectare net income generation, where land types and topologies would support it. For the sake of simplicity, and at the risk of obscuring vital differences among good and bad seasons, various sub-sectors, and differentially productive soils and geographies, the tables are based on conservative estimates for ‘normal’ or ‘average’ years in income for key land uses in Tasmania: sheep-grazing for wool and fat lambs, beef cattle, dairy, horticulture (itself a very broad category, ranging across fruit and nut trees, specialty crops such as opium poppies and pyrethrum, and vegetable row crops), and wine-grapes.

The comparison is startling. It reveals that were Tasmania to utilise its available quality farm land for anywhere near its optimal value, but with no additional water infrastructure, roughly \$2 billion in gross value could be generated (in this first-cut analysis, we have used gross margin—essentially sales revenue minus input costs not including wages—as a proxy for value added). Since agricultural production in Tasmania is currently worth about \$1 billion, that represents a doubling of potential value. With additional—but technically feasible—irrigation, that additional value could rise to \$4 billion, bringing the total value of agricultural production in Tasmania to \$5 billion. With further processing, for example making wine grapes into wine, along with growth in aquaculture contributing another potential \$1 billion, it appears feasible to add an additional \$5 billion over today’s value to Tasmania’s combined agriculture and food industry, or \$10,000 per Tasmanian. To conceive how great is this contribution, it is worth noting that additional value of this magnitude would roughly double Tasmania’s total out-of-state sales and make Tasmania the richest state, per capita, in Australia.

Of course, the reality of how agriculture and food production will evolve is impossible to predict. These are ambitious targets. The future depends on thousands of individual land-use and investment decisions, made by individuals, families, and companies. All experience indicates that it is impossible for governments to forecast accurately or to direct industry-development patterns with any precision. These decisions will undoubtedly surprise policy-makers and move the economy in unpredictable directions, as decision-makers discover unexpected opportunities, make mistakes, and calculate their own willingness to take risk and commit effort and resources. What government *can* do, however, is create conditions that provide incentives and encouragement, and make innovation more feasible and more profitable.

The question that arises from the historical picture of the food industry is Why has the food industry not made more progress toward a potentially more prosperous future?

Unlocking Tasmania's food industry potential

Many conjectures and myths about why Tasmania is held back exist and popular ones in the food industry include: input costs are too high, customers perceive Tasmania is too far from the market, transport costs over long distances are too high, insufficient demand, lack of skills, too much regulation and so on.

Interestingly, lack of capacity to supply products at all or in the volume and quality required consistently over time features much less often but there is evidence it is a big problem. The Japanese encouraged (some might even say pleaded) with Tasmanian producers to grow higher margin intensive agricultural products to their cultural tastes, such as cherries. Anyone who has driven past the Salmon Ponds recently (among other places) can see the dramatic impact of new higher margin land use (sheep replaced with cherries).

Other examples of supply issues abound. Downward price pressure on potato farmers and action and threats by some players to increasingly import potatoes from New Zealand and elsewhere a couple of years ago have been replaced more recently with significant price rises and large target potato volumes to entice growers to supply the Tasmanian spud.

In May 2005, McDonalds announced that it had halved its potato contract with Simplot, sourcing potatoes from McCain's New Zealand operations instead. Simplot cut its potato contracts with Tasmanian farmers and potato production reportedly decreased by around \$8 million (GVP of potatoes was around \$75m at the time).

In 2008 Simplot lifted its price by around \$90 per tonne or 33 per cent and the company hoped to source 200,000 tonnes of potatoes (Tasmania produced 302,000 tonnes of processing potatoes in 2007, ABS)

In 2007, McCain's offered a price increase of \$30/tonne and wanted an extra 30,000 tonnes of Tasmanian spuds to make up for expected shortfalls in Victoria because of the drought. The Tasmanian salmon industry intends to double in value by 2015 (from around \$270m in 2007) and access to sufficient water is one constraining issue.

These anecdotal examples demonstrate that a more systematic look at unfulfilled potential, supply constraints and capability such as preserving the highest quality of perishables throughout the logistics chain (not just meeting minimum standards) is warranted. This is not to say input prices, business cycles and other factors are unimportant, but rather that the attention of industry and policy makers needs to be on the things that make the biggest difference *over time* – ie not be distracted by cyclical market dynamics, mis-reading temporary crises as immovable structural shifts and ill-informed mantras from lobbyists that are sustained, in part, through media reporting and re-enforced through misplaced reactions and policy initiatives.

If supply and capability issues are constraining growth, what factors might have created a more limiting or constraining environment in the food industry. One candidate is the notion of lock-in to existing uses of agricultural land in the face of changing trends and emerging opportunities. A study of the Coal River Valley illustrates how prosperity can be unleashed by embracing land use change within agriculture.

Coal River Valley

The transformation of the Coal River Valley from a relatively low value dryland farming area in the early 1980s to a growing, strong, prosperous and resilient food district provides some useful insights into the factors driving change.

The area of irrigated land in the Coal River Valley increased from an estimated 125 ha in 1983 to 2,644 ha in 2008. Industrial scale irrigation introduced through building the Craigborne dam - and subsequently augmented by the diversion of urban water in low demand periods to a 'winter storage' dam and through introducing re-use water from Clarence - permitted significantly more value per hectare to be extracted from what was previously predominantly a dryland farming area.

First, the productivity per hectare of existing agricultural products increased – but more importantly, a 15 fold increase in gross margin from 1983 to 2008 (in real terms) was principally a result of introducing or dramatically expanding high gross margin irrigated agriculture such as cherries, apricots, wine grapes, turf and table ready salad greens to name a few. Importantly, the valley is currently being held back by a *lack* of water, as the current demand for water has outstripped sustainable supply and intentions to expand are being constrained.

Irrigation was a necessary pre-condition to transforming the Coal River Valley from predominantly low margin agriculture to much higher gross margin uses, but it was not sufficient. Land owners had to perceive new higher margin uses for newly irrigated land were possible, or allow new entrants to buy or lease land. Geographic risk (other than water eg soil type, frost), production risk, financing risk and market risk had to be identified, assessed, tested and managed prudently.

Irrigation *permitted* a new future for the valley to emerge, but the transformation to a more prosperous future did not happen until a range of other significant impediments were overcome and initiatives and actions took place, including local business *and* community leadership coordinated through the Coal River Products Association.

The meander dam is another example of the constraining force of ‘lock-in’.

“The Government is working on a deal with Tasmanian Water Solutions to underwrite the dam in response to a shortfall of investors.

The president of the Farmers and Graziers Association, Roger Swain, says farmers are historically slow to support such projects. “ ABC News 2 Nov 05

A second contributing factor is the overwhelming focus of government agricultural policy, industry extension and other services on expanding existing agricultural uses and making them more secure and more productive.

Relatively little attention and resource is applied to exploring new or expanded higher margin uses for existing agricultural land on a large scale - nor what is required to make the change. When it does occur it is usually a

response to a crisis (Coal River Valley, Dorset) or is pursued on an ad hoc basis such as the South East Tasmania Water Options Report 2002.

An example of policy settings and planning that constrains possibilities is DPIW's Land Capability Handbook 1999 that cautions at page 5 'Land capability assessment should not be confused with land suitability assessment which, in addition to the biophysical features, does take into account economic, social and/or political factors in evaluating the 'best' use of a particular area of land...Land suitability also requires much more detailed collection of land resource information pertinent to the particular land use eg soil nutrient status. This level of detail is outside the scope and resources of the 1:100,000 scale series.'

The analysis of land *suitability* for agriculture in SE Tasmania outlined earlier in this chapter illustrates how looking at the potential of land identified significant unfulfilled agricultural potential that could feasibly be released from shifting away from predominantly dryland agriculture. A broad scale investigation of agricultural potential in SE Tasmania in 2002 found around 14,300 hectares could be used for more intensive horticulture in SE Tasmania on soils that are least suited for annual cropping (particularly class 4 and 5 soils) - if issues such as water, frosts, drainage and other limiting factors can be overcome or mitigated. The study identified around 10,000ha of unfulfilled potential as only 4,000ha was in irrigated intensive horticulture at the time. The issue of undertaking land suitability assessments to reveal the full agricultural potential of arable land in Tasmania is explored further later in this chapter.

Large scale irrigation development is another example of policy and planning that is limiting agricultural growth and productivity. The financial feasibility of irrigation projects is often presented as 'marginal'. The empirical evidence suggests that financial feasibility of irrigation schemes in Tasmania is often grossly under-estimated. There are two key reasons. First a perception that the return from the intended agricultural use will not be sufficient to cover the cost of water is often predicated on expanding or increasing the productivity of existing agriculture that may be a marginal irrigation proposition. Second, feasibility studies and policy makers are often conservative in their assessments lest they be seen as raising expectations or risking their reputation. Examples of both constraining factors are outlined below.

An Economic Evaluation of the Coal River Irrigation Scheme Dept Agriculture 1981

‘4...However, only 15 out of 36 landholders expressed a keen desire to become irrigation oriented farmers. The census results also indicated that a majority of the water would be applied to pasture, forage crops and Lucerne with only small quantities of water being applied to crops.’

‘9. The overall viability of the scheme is highly dependent on the benefits which accrue to the vegetable and Lucerne enterprises. Less development in these two enterprises compared with that indicated by the landholder will adversely affect the viability of the scheme. Conversely increased development of the vegetable enterprises would improve considerably the potential viability of the scheme.’

South East Tasmania Irrigation Scheme Craigborne Dam Stages 1 and 2 An Economic Evaluation Dept Agriculture 1983

‘6.2.7 As a general principle it is apparent that the profitability of the scheme as a whole is heavily dependent on expansion of those enterprises exhibiting high gross margins , particularly fresh fruit and vegetables. It may well be dependent on expansion of areas of the areas of these enterprises beyond the levels indicated in this analysis . *The capacity of the local fresh fruit and vegetable markets to absorb such quantities is questionable.*’ (emphasis added)

The emphasis is on not taking risk rather than evaluating risk and managing risk – eg there is no consideration of markets outside the local area and there is no discussion of what it would take to develop high margin agriculture.

A study in 2008 by Davey and Maynard for the Coal River Products Association shows that much of the past and intended expansion in water demand has been for higher margin agriculture. In 2008 \$75.6 million or 90.1 per cent of the gross value of production derived primarily from 4,375 megalitres of reticulated irrigation (and on farm storages) was made up of high value horticulture including vegetables, stonefruit and wine grapes. The farmers intend to increase the gross value of production from irrigated land by \$33.2 million in the five years to 2013 (if water is available) of which 23.0 million or 72.0 per cent will be for vegetables, stonefruit and wine grapes.

What the experience of the Coal River Valley clearly shows is that when new higher margin land uses are perceived and explored in more detail the game can change dramatically. In 2008 the original scheme and at least two irrigation supply augmentation projects implemented since 1986 are struggling to cope with current demand for water. The dry spell to early 2009 put the whole region at risk of collapse for lack of water. The intended further expansion of irrigation intensive agriculture to 2013 cannot be sustained under recent water availability trends.

The impact of overly conservative mindsets of many farmers and policy makers and the expansion and income that can be generated by looking at agricultural potential and what it takes to realise that potential is clear.

Finally, the dominance of electricity generation in water policy and management in Tasmania might also have contributed to a mind set that prevented policy makers and industry considering or acting on ideas for the post-hydro use of water. Most of the water potentially used for large scale irrigation is likely to be under the control of Hydro Tasmania. Hydro Tasmania ensures that it does not suffer any financial or other impacts in considering other uses of the water in its control, including for irrigation. Potential irrigation initiatives must therefore factor in any additional costs of either moving water from the point/s at which Hydro Tasmania has no further use for it or paying Hydro Tasmania the full value of the energy that is foregone. In these circumstances, irrigation can be perceived as prohibitively expensive or too difficult technically and practically (relatively longer haul distances, more fragmented and complex land tenures, higher pumping costs, more difficult terrain/obstacles and so on).

The Preliminary Investigation Feasibility Study Poatina Tailrace/Brumby's Creek Re-regulation Pond Irrigation Scheme, ARM March 2007 envisaged a transmission pipeline from Poatina tailrace to Tunbridge of around 73km using 9 pumping stations and notes

‘The entitlement to the use of the water in the tailrace and Re-regulation pond formally belongs to Hydro Tasmania under the *Water Management Act 1999*. However, Hydro Tasmania has indicated a willingness to consider the transfer of up to 50,000 Megalitres of this water entitlement to irrigators under conditions which avoid any impact on its electricity generation responsibilities and revenues.’

The preferred Midlands Water Scheme announced recently indicates:

‘Water used from the Arthurs Lake Irrigation Scheme will be bought from Hydro Tasmania at the cost of the equivalent foregone electricity that would have been generated if it was put through Poatina and Trevallyn generation facilities.’ Midlands Water Scheme Q&A sheets, Tasmanian Irrigation Development Board

High margin agricultural crops and the associated markets, land suitability and other constraining factors is even more important when irrigation schemes and plans involve sourcing water controlled by Hydro Tasmania.

An innovation strategy for the food industry

Jonathan West has prepared a comprehensive innovation-driven strategy for un-locking and developing the potential of the food industry in Tasmania. The full strategy is included in an appendix. What we outline here is the consideration of one initiative from the strategy that has large and broad based benefits, is relatively inexpensive, is ‘doable’ with existing resources and technology and is not already underway in any substantial way.

‘ Make available high-quality information about land-use potential. Land owners and potential investors, as well as those who scrutinize candidate investment proposals, should have access to a comprehensive, high-accuracy, and publicly available data base that classifies land according to its suitability for various agricultural purposes. Having one’s land officially so classified could, for example, enable farmers to seek support from investors for new development projects, and thus facilitate movement up the land-use value hierarchy. Surprisingly, no such comprehensive database currently exists in Tasmania, although key pieces of such information are scattered among various government and not-government entities.’*

One possible model on what might be undertaken for agricultural land and how it can be arranged is the case of pre-competitive information on mineral prospectivity developed by Mineral Resources Tasmania. The pre-competitive mineral prospectivity concept involves the use of new and enhanced remote sensing and mapping technologies to enable users to ‘see’ further into the Earth to locate new regions with potentially economic mineral deposits. The more relevant insight from the model is how the information is made available to prospective

mining and mineral investors. Here is a snapshot of a limited range of data accessed from Mineral resources Tasmania web site 23 April 2009

Mining Tenement Data

Current Exploration Licences

Historical Exploration Licences

Mining Leases

Historical Exploration Activity Data

Digital Geology of Tasmania

1:500 000 scale Digital Geology of Tasmania

1:250 000 scale Digital Geology of Tasmania

1:25 000 Scale Digital Geology of Tasmania

Geophysical Data

A shapefile (with associated metadata) of the boundaries of airborne geophysical surveys for which digital data is held may be downloaded using the export function of the [map viewer](#).

Airborne survey data may be downloaded by selecting the desired dataset in either the [map viewer](#) or the [search form](#). The gravity station distribution may be [viewed](#) or the open file gravity data may be [downloaded](#)

The application of this sort of approach in the food industry could deliver significant economic leverage and return on public investment by providing comprehensive, adequate and time-relevant information on the potential of land for alternative and higher margin agricultural uses that is not available to individual industry participants and potential investors.

The implementation challenge

The food industry is large, diverse, fragmented and involves many links within the industry and to related and supporting government and private sector businesses and representative organisations.

The first challenge is to establish the level of support for the overall food industry strategy, understand any key areas of concern and work through the issues including the gathering further data where needed. Second, and in uncontested areas of the strategy in particular:

- continue and enhance trials and pilots that are consistent with the strategy, have broad application and are already underway - cool fish

- introduce new trials and pilots particularly where they have the potential to inform existing policy commitments that have significant impact – eg improve the estimation of land *suitability* (not just existing agricultural use and farmer intentions) to better define the agricultural potential of land in irrigation schemes under consideration and test its utility as a tool for assessing and prioritizing the feasibility of existing and future irrigation development in particular
- identify initiatives, actions and resources that might need to be scaled back or abandoned
- maintain flexibility to adapt to emerging circumstances – eg the recently announced planned augmentation of broadband will have profound implications for what may become possible and the pace of transformation that can occur if ultra-high speed broadband is more widely available at competitive rates.

Appendix

An Innovation Strategy for Tasmania

Conceptual Background and Initiatives Outline

Food as Model Sector

DRAFT ONLY

Jonathan West, January 2009

Extract relating to a food industry strategy reproduced below

An innovation strategy emphasising upgrade of the agricultural and food industries offers the potential to insert a new ‘mainspring’ into Tasmania’s economic development—let’s call it ‘hydro-agrarianisation’—one which promises to overcome the divisions that have racked Tasmanian society over the past three decades, offers something to everyone living here, and can build broad-based momentum for years to come. Tasmania can be the Provence or Tuscany of Australia: a great place to live, with a sustainable and thriving economic base for long-term prosperity.

The food industry paints an appealing vision of the advantages Tasmania could gain by investment in an innovation strategy, and of the society it would create, but is this kind of transition in land management, and value created, really feasible? How might it, and its associated value increase, be facilitated, if at all? It certainly cannot be said that Tasmania is currently on the path to the future sketched earlier in this book. Substantial innovation in land use, water use, product specialisation, and skill levels would be required to make this vision real. But it is critical to recognise that the strategy outlined here is not conjured out of thin air. It rests, rather, on existing assets and strengths of the Tasmanian economy, and seeks to augment and connect these to induce substantial innovation.

The vital physical assets are water, land, and sunshine. Tasmania is ideally positioned in all three. Indeed, it has these natural elements in abundance. With 0.9% of Australia’s land area and 14% of Australia’s water,

Tasmania has by far the highest ratio of water to land mass of any state. Tasmania has an abundance of arable land, with 2.3% of Australia's population and 9% of Australia's quality farmland. And because Tasmania is the most southerly portion of Australia's land mass, it enjoys the most sunlight during summer and autumn, the key ripening period for important horticultural crops, including wine grapes. To combine with these natural assets Tasmanians have accumulated considerable experience and expertise in food production and are in the early stages of building an umbrella brand to gain recognition for these products.

The purpose of the initiatives proposed here is to add to these natural assets and accumulated experience and organisation, to improve the regional platforms through which innovation in this sector can take place. The proposed initiatives below are grouped around the major elements of effective innovation systems, as identified by lessons gained from the study of innovation processes around the world over the past 30 years.

To make this vision feasible, Tasmania needs a comprehensive and coherent strategy comprising the following elements:

1. Upgrade infrastructure: physical, logistics, information, market intelligence.

The starting point for the ambitious innovation strategy outlined above is physical infrastructure, particularly in water, distribution capability, and branding. Initiatives to achieve this could include:

* *Substantially increase commitment to irrigation infrastructure.* Water availability is the key to unlocking Tasmania's food-production potential. The water exists in Tasmania, but only a very small portion is utilised for agriculture. It falls on the western half of the island, but is needed on the eastern. The Tasmanian Government has currently committed a total of \$80 million to irrigation infrastructure, to be combined with Federal Government and private capital to support what amounts to a relatively modest program of irrigation construction. Given the apparent potential, and water availability, it would be sensible for combined governments (State and Federal) to increase that commitment considerably, perhaps to as much as \$1 billion. While this sum may seem large, in the light of Australia's water challenges and the potential of Tasmania to become the southern food basket of the nation, supplying the bulk of its temperate products, such a sum does not seem unrealistic. Since the current

Federal Government projects to spend up to \$12 billion on Australia's water resources, mostly *taking out* capacity in the Murray Darling—indeed, removing an estimated 40% of Australia's irrigated horticulture capacity—committing \$1 billion to *adding in* capacity in Tasmania appears sensible. The alternative might be for Australia to become a net food importer, potentially from China.

* *Build an institutional structure to plan, construct, and manage these assets.* An irrigation system on the scale warranted would require a coherent and coordinated approach, which considers Tasmania's water assets as a whole. Responsibility for water management in Tasmania is currently fragmented across multiple agencies and levels of government, with only *ad hoc* interaction. Much responsibility for water management now rests with Hydro Tasmania, which has deep expertise in dam and pipeline construction and project management, but its mandate is limited to electricity generation. To remedy this, the Tasmanian Government could amend Hydro Tasmania's charter to grant it responsibility for water management as a whole (probably excluding drinking water supply) and give it the mission to construct the irrigation system Tasmania needs. Hydro Tasmania also possesses unmatched environmental stewardship and planning-approval capability, and Tasmanians could be assured that an ambitious program of irrigation construction would not compromise environmental responsibility in matters such as endangered species and stream-flow. Of course, an independent assessment and approval process would continue to be required.

* *Augment small-batch and specialty logistics.* Much of Tasmania's logistics capacity is oriented to high-volume, low-value commodity movement, which is unsuitable for small or medium-value, perishable products. Improvement of this capacity, coupled with superior information traceability would be a priority under this strategy.

* *Facilitate Tasmanian businesses to connect to markets and consumers through a unique, high-content, Web-interface platform.* The ability to market directly to consumers—not necessarily to *sell* to them, but to provide and gather information about preferences and opportunities—would greatly facilitate reaching premium markets. The Tasmanian Government should facilitate a Web-enabled identity-preservation platform for food producers, in which highly specific information could be made available about bar-coded, RFID, or unique-numbered products,

up to and including on an individual-item basis. Under such a scheme, individual producers could provide stories and information about specific products, with links to webpages providing dates of harvest, information about the particular variety, cooking and preparation uses, or any form of information desired by consumers or processes. Government facilitation of the platform and associated training of the producers could potentially substantially reduce difficulty of website construction for individual businesses and dramatically raise marketing possibilities for individual users, greatly increasing the potential for value capture from product differentiation.

** Make available high-quality information about land-use potential.* Land owners and potential investors, as well as those who scrutinize candidate investment proposals, should have access to a comprehensive, high-accuracy, and publicly available data base that classifies land according to its suitability for various agricultural purposes. Having one's land officially so classified could, for example, enable farmers to seek support from investors for new development projects, and thus facilitate movement up the land-use value hierarchy. Surprisingly, no such comprehensive database currently exists in Tasmania, although key pieces of such information are scattered among various government and not-government entities.

2. Improve human capital.

The actions described above all rest on the willingness and ability of individuals to tackle and solve problems. This is a particular challenge in Tasmania's agricultural sector, where the average age of farmers is almost 60. To address this need, the State Government should embark on an aggressive, targeted program to augment training and skill levels. The greatest needs are at the levels of highest expertise. The Tasmanian Government could:

** Create a top-flight farm-management and food-based entrepreneurship tertiary-training institute.* Surprisingly, and in spite of the fact that food and agriculture is arguably Tasmania's most important industry sector, it is not possible for young Tasmanians to study farm-management in the State. It is possible to study agricultural or botanical science, and great emphasis is placed on natural resource management, but for farming and food production as a *business* students must leave the State, going to Marcus Oldham College in Geelong, the

University of New England, or Lincoln University in New Zealand. A high-quality degree-level program, contributing as few as 50 bright, young, well-trained and confident farm entrepreneurs each year to Tasmania's food industry, would be invaluable in making possible the land-use transition described above.

* *Create Australia's leading institute for training high-end chefs.* At the other end of the food chain, an important gap exists at the pinnacle of cooking and food-presentation in Australia. Australia currently has no high-end school for training chefs, equivalent to the Culinary Institute of America (known as the CIA) or Cordon Bleu in Paris. Tasmania should seize this opportunity. Training perhaps 50 world-class chefs each year in Tasmania would contribute greatly to Tasmania's reputation as a home of fine food, and training the students with Tasmanian products would increase awareness among the influential elite about what Tasmania has to offer. If only 10 more each year remained in the state, they would over time revolutionise the state's restaurant sector. The benefits to food product development, Tasmania's brand, and the tourism industry go without saying.

3. Reduce the cost to Tasmanian businesses of utilising science and technology.

The Tasmanian Innovation Census found a high level of external sourcing of knowledge in the Tasmanian food and agricultural sectors, along with a high level of collaboration between the University of Tasmania and Tasmanian food businesses. Tasmania possesses valuable food-related research capabilities in the Tasmanian Institute for Agricultural Research (TIAR), Tasmanian Aquaculture and Fisheries Institute (TAFI), and the Cooperative Research Centre for Food Safety, all affiliated with the University of Tasmania. But important obstacles to collaboration between bodies such as these continue to exist, with some exacerbated by government policy.

Most government programs to encourage commercial interaction between publicly funded research institutions and private companies effectively aim to *increase* the price of science and technology to private companies. This result may not be intended, but it creates a serious obstacle to private access to public research.

As governments, especially the Federal Government, have focused on gaining the maximum-possible return from public science and technology investment, and as research agencies strive to demonstrate their value to government, governments in many jurisdictions have created incentives for research institutions to capture as much benefit as possible for *themselves* from their research and expertise, rather than for private industry. They do this by maximizing the price of intellectual property and technology consulting. These incentives have been promulgated under the banner of ‘promoting a more commercial-oriented culture’, but the effect of raising the price of any good is usually to reduce its demand, and hence its usage.

Rather than pushing public research organizations to raise their prices, government should encourage these institutions to *reduce* their prices as far as is feasible. Of course, if the price is reduced too far, firms may not sufficiently value intellectual property, but certainly if it is increased excessively, its adoption will decline.

To offset this tendency, the Tasmanian Government could:

- * *Create incentives for universities to release intellectual property.*

- * *Open up its own intellectual property*, by making it freely available to Tasmania-based businesses, with a proviso that an enduring license be granted back to the Government.

- * *Support universities to collaborate with businesses for problem-solving.* This could be facilitated by targeted funding for consulting projects to enable the University to free its personnel to work with industry. Rather than provide grants directly to companies, the government could fund problem-solving efforts that collaborate between companies and expertise providers. Such funding would encourage ongoing capability formation and maintenance.

- * *Expand the developing cluster of food-related research in Tasmania.* Tasmania is already home to several leading food-related research bodies, and the Tasmanian Government has been instrumental as a partner in building them. In addition to these, Tasmania could potentially be home to further institutes which could strengthen these through collaboration and make available greater expertise to local producers. Particular opportunities include relevant specialty areas such as cool-climate wine and stone fruit production—a major growth opportunity for Tasmania which could build on established work at the Grove Research Station of the DPIW—and high-

performance foods for athletes and elite soldiers—building on Tasmania’s long-standing research and production effort with the Defence Science and Technology Organisation at Scottsdale. These projects can frequently be funded together with the Federal Government.

4. Encourage capital allocation to innovation.

With more than \$4 billion in privately managed investment capital in 2006, including \$2 billion in Tasmanian-domiciled superannuation funds, the Tasmanian economy possesses in aggregate more than enough capital to support its innovation needs. The problem is that too little of this capital is devoted to the activities of innovation. The result has been serious constraints in the development of innovation in the State.⁷

Governments in Tasmania and elsewhere have attempted to redress this difficulty by offering taxpayers’ funds to start-up and technology companies, through grant programs targeted at special niches. Most have focused on new companies in high-technology sectors, although in Tasmania a broader range of sectors, including (successfully) agriculture, have been promoted in the past. Alternatively, governments have offered generous tax concessions for R&D expenditure, in an effort to promote business-backed innovation.

Neither of these approaches has been demonstrated to increase the overall rate of innovation in the Tasmanian economy. Worse, both appear to distort capital-allocation processes and entrepreneurial activity in undesirable ways.

In the first instance, these programs, especially tax concessions to R&D, amount to subsidies to high technology, which as we noted above is a tiny proportion of the economy. More seriously, they can induce widespread system-gaming behaviour by firms and dependency on government largesse. Increasingly, firms

⁷ 50.3 per cent of businesses surveyed by the ABS reported difficulties gaining finance—which included ‘excessive economic risk perceived by business’, ‘excessive economic risk perceived by financiers’, and ‘cost or availability of finance’—as important obstacles to innovation. Australian Bureau of Statistics, *Innovation in Australian Business* 2005.

oriented to these programs fine-tune their activities in ultimately suboptimal ways to remain eligible. Among undesirable consequences of government free-grant programs to support innovation are:

- * Selection of senior management on the basis of close relationships with government and skill and experience with grant programs—not necessarily ideal characteristics for entrepreneurial leaders.
- * Channeling of firm activity to meet government reporting formats, evaluation measures, and poorly formulated targets.
- * Deliberate restriction of firm growth in order to remain below eligibility thresholds.
- * Development of a mendicant, government-dependent corporate culture.
- * Direction of attention away from real customers, real markets, and real capital providers towards ‘free’ government money.
- * Curtailment of growth in private risk-capital vehicles, which are required to gain commercial returns on investment and cannot compete with taxpayer-subsidised investment capital.

Yet, as noted above, the issue remains: too little Tasmanian and Australian investment capital is allocated to innovation activities. To develop alternative policies that can address this vital issue, it is necessary to begin with an understanding of why insufficient capital might in general be devoted to innovative economic activity. As we noted above, the underlying reason is that under certain circumstances private investment vehicles cannot manage the associated risks or cannot capture sufficient return to attempt innovation.

As discussed above, capital will not accept innovation risk if it cannot manage the terms of risk in the sector under consideration. These vary from sector to sector. Government can play an important role in remedying these ‘market failures’, not by substituting itself, but by tilting the playing field in favour of productive investment in innovation projects, and doing so in ways that match the specific demands of the sector in which it aspires to promote innovation. A critical principle to be adhered to in this endeavour is that capital be allocated by private

investors, who have the experience to assess and accept risk themselves, rather than by government officials or government-appointed boards. Proposals to achieve this end might include:

* *Avoid free-money grant programs for companies.* Government should at the very least require that all taxpayer-funded grants be matched by private money. Since even this requirement is so readily 'gamed', however, the Tasmanian government should not initiate new grant programs aimed at private companies in its effort to promote innovation. Rather it should increase financial support to innovation in other forms, thereby freeing both substantial capital and time of officials to devote to other programs.

* *Create subsidised loans pools for innovative investment,* replenished by repayment on achievement of sustained profitability. In place of grants, the Tasmanian government could create a pool of low-interest loans, repayable on success, which would self-replenish. Such a scheme could be modeled, in amended form, on the successful Higher Education Contributory Scheme (HECS). While such loan pools will not be appropriate or needed in many sectors, which need larger amounts of capital best taken in equity form, where access to relatively small amounts of lesser-risk capital is needed but lacking, such a financial vehicle may be valuable.

Financial pools of this type would be especially suitable for agriculture. Many fields of innovation in agribusiness suffer from time horizons and rates of return that make them difficult investments for other financial institutions. A typical agribusiness investment will take some years to produce cash flow, but then generate reliable, long-term, inflation-protected returns. Consider a venture to grow wine grapes. Establishment of a vineyard is estimated to cost \$80,000 per hectare, but will not generate cash for five to eight years. What bank would lend under these circumstances, even with a mortgage over the vineyard owner's land? Venture capital firms have a different problem with this type of enterprise: while the time horizon and cash-flow schedule might be acceptable, the structure of returns in cash will probably not, nor will the probable equity structure (farmers will be resistant to selling their land to investors as a value-realisation measure).

Government's contribution would be to provide the initial capital, then set a low interest rate, sufficient only to recoup defaults (which themselves should be few given sufficient project scrutiny and due diligence). Such

a scheme could partially substitute for existing drought-support programs and be employed to encourage land-use transition rather than reinforce existing, often inappropriate and low value, uses.⁸

- *Reduce innovation risk by co-investing with investment funds.* These funds could be made non-terminating, allowing them to support innovation projects of longer duration than most venture-capital entities, which must wind up and return investors' capital after seven years. Government could effectively increase the risk-adjusted return to investment in innovation by partnering with private capital providers, thus bearing a proportion of total risk in such vehicles, while accepting a below-market rate of return. In such entities, if government 'capped' its return at a relatively low interest rate, private partners could take the return above that level. The result would be a rise in risk-adjusted return, without distortion to the investment decision-making process, making such investments more appealing to private investors.

This approach would potentially provide a means for Tasmania's superannuation funds to invest in the long-term future of Tasmania through innovation.

* *Reduce innovation risk by offering limited-term crop insurance to qualified new projects.* A key obstacle faced by innovators is that weather-induced crop failure (for example, frost or hail) will wipe out their capital base in the early years of a project, in the years between planting and initial cash-flow, that is, before earnings have accumulated to a level that will allow the farmer to bear the burden of an occasional crop failure. Fear of such random events prevents many projects proceeding. The government could mitigate this risk by offering crop-protection insurance for innovators (but *not* others), such that the risk is diversified across the entire state during this period and not faced by single innovators alone. To avoid moral hazard (see definition above), candidate projects would need to be independently assessed for this insurance to demonstrate that the right crop was planted in suitable areas.

⁸ A similar shift in drought support has been proposed by the National Farmers' Federation. National Farmers' Federation, *Submission to the Productivity Commission Inquiry into Government Drought Support*, 2008.

* *Allow pre-profit businesses to accumulate advantaged tax credits.* This also would serve to increase long-term returns, and hence attractiveness, of investment in innovation risk. This measure was included in the list of proposal coming from the Cutler Commission of Inquiry into Innovation in Australia for the Federal Government, and could be adapted at the State level.

5. Reduce regulatory barriers to innovative Tasmanian companies.

A major problem for innovators in any regulated economy such as Tasmania's is that they are frequently accountable to multiple agencies whose responsibilities and charter do not include sponsoring innovation. These agencies might be charged with ensuring health and safety, preserving the environment, preventing discrimination, or protecting consumers and workers. Any change to the way things are done poses a challenge to such regulators. Since by definition innovation means doing something new, what the innovator proposes is often not covered by the rules and is, in a sense, a threat to the system. Well-meaning regulators then reason that since their charter is other than promoting innovation, their first (and sometimes only) reaction should be negative. Why, they reason, should the innovation be allowed if it puts at risk the agency's primary mission? And in any case, why should the entire set of rules be altered, simply because one small company wants to do something unanticipated? Best just to say no!

To help overcome this problem inherent in modern capitalism, the Tasmanian Government could:

* *Develop a one-stop shop for innovators whose projects will require regulatory approval (which in the food industry would be virtually all).* Often innovators find that they require approval from many different entities, the existence of some of which they are not even aware at the outset. A single government body—potentially sponsored by the Department of Economic Development and Tourism—that would work with innovators to develop timelines, facilitate applications, create regulatory checklists, and ease governmental interactions for private entrepreneurs who are often not accustomed to dealing with bureaucracies would increase the probability that innovators would not be taken by surprise, or give up stymied or exhausted.

** Develop a 'circuit-breaker' to allow potential innovators to test the feasibility of their proposals before permanent or broad regulatory approval is granted.* A major difficulty innovators face in many fields is that they require system-wide, permanent permission to launch their product or change the way a service is provided *before* they are able to test its impact in practice or even whether it works at all. This considerably increases the barriers to innovation. It is as if all new drugs had to be approved for general release to all patients before a clinical trial could be conducted. In the pharmaceutical industry, the institution of clinical trials separates approval to test, under limited circumstances and for a limited time, from approval for general release. The same concept could be extended to multiple arenas of the economy, from food products (for example, raw-milk cheeses) to traffic regulation (permission to run larger or different vehicles on specified routes) to ocean-based farming (permission to raise abalone in sea cages).

This would require an agency whose responsibility was to determine the conditions under which trials limited in scope and time could be conducted, to accumulate data and assess ideas before they were considered for permanent approval. Not all new ideas would be allowed even to be tested, of course, but by limiting the scope such an agency would reduce the regulatory hurdles for innovators to demonstrate their case.

** Undertake a dedicated audit of Tasmanian regulation to assess its impact on innovation risk and incentive.* While regulations are often assessed for their impact on a wide range of measures, including safety and cost, they are rarely assessed for their impact on propensity to innovate.

** Remove its ban on GMO crops, at least initially for non-human-food crops.* While some argue that Tasmania gains a slight marketing advantage from prohibiting genetically modified foods, it is difficult to imagine Tasmania becoming a leading innovator in the food sector if it effectively bans the most powerful technology for innovation in this sector ever invented. Scientifically, the ban makes little sense—all foods are 'genetically modified' from their 'natural' form, only by certain techniques (such as forced selective breeding) rather than others (deliberate gene insertion). At the very least, Tasmania should lift the prohibition on GM crops not for human food use, such as pharmaceutical plants and animal fodder. As time passes, Tasmania's disadvantage will only escalate if it opts out of this dynamic field of technology.

Furthermore, maintaining a ban on GMOs conflicts with the government's commitment to reduce Tasmania's output of greenhouse gases. Fertiliser and pesticides are both products of fossil fuels, and would both be substantially reduced by genetic modification techniques in crops.

6. Upgrade and focus Tasmania's image and self-image, its 'brand'.

To support expanded production and a shift to higher value products, Tasmania will need to increase and transform its national and international image. More of Tasmania's food products will sell directly to consumers, and fewer will be commodities. Under these circumstances, brand becomes vital. To enable Tasmania's branding strategy to support its innovation strategy, the first step is to recognise that building and reinforcing its brand is as important as building physical infrastructure, and should not be treated as an after thought or 'poor cousin'.

Until recently, Tasmania's branding effort especially national advertising, has focused overwhelmingly on tourism. But images that might be appropriate for tourism do not necessarily support branding to meet other goals, and might actually undermine them. Images of lonely beaches and remote wilderness, for example, do not necessarily help attract young families or entrepreneurs who are looking for vibrancy and modern facilities.

Tasmania's brand should explicitly be oriented at promoting Tasmania as a source of the highest-quality food and as a place for dynamic young families to settle, and resource allocations to support the brand should be substantially expanded. To re-brand Tasmania as a place of innovation, the state's efforts should beyond advertising and focus on portraying our island as a place where leading-edge ideas are debated and new technologies adopted. Two initiatives to move the state in this direction would be:

* *A nationally prominent festival of ideas.* Such a festival should aim to highlight the state's engagement with frontier thinking globally, and to showcase the best of local ideas and innovation. By partnering with Internet and media providers, an opportunity exists for Tasmania to seize the space as the natural location and leading event of this type in the nation and to speak directly with the world. The festival would also provide an opportunity for the state to showcase its adoption of new technology, demonstrating that it is possible to live here, physically distant from the rest of the world, but no longer mentally or technologically so.

* *State-of-the-art utilisation of information technology at tourist sites.* This should include especially locations where tourists could experience and learn about local foods, but should extend to museums, heritage sites, and tourist shopping areas. The state could relatively cheaply provide lower-bandwidth wireless access at such locations, suitable for the provision of simple information and advertising with a common interface, and direct users to local for-profit providers for higher-bandwidth needs.

* *A global business-plan contest.* Business plan contests promote new ideas and new businesses, but perhaps more importantly, they signal the character and enthusiasm of the institutions that sponsor them. Good ideas are brought to the surface, and interested entrepreneurs and potential investors focus their attention on the sponsors and participants. They are common at Universities, perhaps the most famous being that of the Massachusetts Institute of Technology, and are usually rather small scale, although often vital in spurring on the companies that succeed in them. Tasmania could potentially attract world wide attention with the world's first state-sponsored business plan. It would signal that Tasmania was 'open for business' and entrepreneurship-focused. To be successful in promoting the state's brand, Tasmania's contest would need to combine several features:

- Offer a substantial sum—say, \$50 million—to attract worldwide attention.
- Require that private investors match the state's prize money.
- Require that entries be food-related.
- Require that the winning company be substantially Tasmania-based (though not necessarily Tasmanian by origin).

7. Strengthen community strategic and cohesion capability to facilitate entrepreneurship.

None of the above measures will succeed without the enthusiasm and commitment of entrepreneurial and dedicated people. In any innovation process, unexpected obstacles and unforeseen setbacks will be many. Only relentless will and the support of friends and colleagues keeps innovators going.

And innovators never succeed alone. They draw upon resources, expertise, and emotional energy from their community. These communities are almost invariably geographically defined.

The most important support the Government could provide to innovation in Tasmania would be to focus on supporting specific industries in specific places. The measures outlined above should all be implemented regionally and in coherence with one another. Irrigation alone, for example, will not likely create much innovation; capital, know-how, and entrepreneurial spirit will also be vital. These exist in communities and can be strengthened only at the community level.

The same drivers that enable national economies to grow—nimble regulation, trade, innovation, productivity, skills, connectivity—are also now widely recognised to be vital contributors to how well local economies perform. Local and regional development policies require better co-ordination between these drivers to construct and reconstruct advantage. Local economic development is a strategic activity best delivered through collaborative efforts, which identify long-term economic rationales (as outlined in this paper) and niches, and seeks to build on embedded local knowledge as well as natural and latent competitive advantages. Thus, for example, local councils increasingly play an important role as economic agents in ‘place shaping’ (Lyons Report UK 2006).

** Innovation promotion should be combined with community strengthening, and decentralised.* To make innovation of the type described here actually happen, each sector and region will require a specific mix of measures and will likely encounter a unique set of obstacles. This means that a statewide innovation strategy should be built up from a series of regional innovation strategies, in the most decentralised fashion possible. The ‘subsidiarity principle’ should dominate: no activity should be performed at a higher level if it can be performed at a lower one.

** Innovation policy should mesh with a Tasmanian population-settlement and livability strategy.* There are now for the first time 500,000 Tasmanians. It is an appropriate time to think about the choices we need to make to shape the future communities we live in. An innovation strategy will provide important guidance for both the skills profiles of Tasmanians in the future and for the places in which they are likely to live. This, in turn, will enable government better to plan the social infrastructure required to attract and retain its future populations, especially those currently at risk of leaving the state, young professionals. A population settlement and liveability strategy would focus on the types of communities that we need, to foster the creativity and networks that underpin

innovation. Tasmania should devote concerted effort to understanding where our future regional centres might be, and the types of economic social and environmental infrastructures needed to ensure their sustainability.

The Demographic Change Advisory Council has mapped future populations by local government area (LGA) and on these projections many LGAs face uncertain futures. Some of these LGAs (such as Dorset) are likely to be central to the food component of the innovation strategy. The innovation strategy is therefore likely to provide hope and sustainability to many of our regional communities. But economic opportunity alone is unlikely to attract and retain the skilled workers of the future, a range of livability incentives are required in regional towns such as ready access to the arts and leisure opportunities, the amenities of a city but the feel of a country village, flexible housing options, flexible business ownership and management options, and access to skills development opportunities.

In the context of an innovation strategy the key objective of a population settlement and livability strategy would be to shape the future number, diversity (age/skills), and location of Tasmanians to maximise opportunities for wellbeing, wealth creation and a creative, stable skilled workforce.

* *Promote community enterprises.* Community enterprises are commercial operations with a high level of community ownership. An important goal of the enterprise is to reinvest in the local community to maximise the local value of each dollar. Community enterprises support local communities to increase their knowledge of and engagement with uses of local assets, which are then managed in an ecologically sustainable manner and for the socio-economic benefits of the local community. The exact level of involvement is negotiated within the community and between the community and the appropriate agencies and levels of government and industry. As an example, some communities might wish local governments to negotiate ownership/leasing arrangements of forest assets with Forestry Tasmania, or they might use regional natural-resource-management groups or local community economic development organisations. This does not limit the options; other creative responses will emerge. The three components of community forestry—local involvement, socio-economic development, and ecological sustainability—are subject to negotiation between the parties engaged in the project. Similarly, community enterprises could have access on a place basis to the proposed subsidised loan pools. A place-based approach

enhances the capacity of a mix of local players (councils, small and medium enterprises, community agencies) to best understand and extract value from embedded local resources through an ‘innovative milieu’.

* *Found a Centre for Entrepreneurship and Local Development.* Strong local institutions are required to support regional approaches to innovation that increase productivity and economic growth. Tasmania needs to build local leadership capacity—civic, economic, social, and environmental. Many of our local councils struggle to attract or develop leaders. The Centre could provide a focal point for the many *ad hoc* leadership programs already in place, and be more strategic in ensuring that regional communities have plans and resources to develop and support social, economic, and environmental entrepreneurs. Importantly, such a centre could also provide the network capacity that in itself fosters creativity and innovation. (Prime Minister Rudd has recently announced funding for a Centre for Excellence in Local Government Leadership.) An important functions of such a centre would be to provide knowledge of regional value chains, investment strategies, and financial tools for local economic development.

* *Create ‘Small Area Development Plans’.* Many farmers and farming communities now accept that some traditional farming practices and business approaches are no longer sustainable. Communities increasingly seek advice and support about how to transition to new futures. Following the successful example of the University’s demonstration farm in the Coal River Valley, small-area development plans could model, test, and demonstrate how such transitions might best be organised. The strategy would initially target three types of areas:

- Drought-affected areas (for example, Levendale).
- Areas likely to access irrigation in the future (for example, Waterhouse).
- Areas with new irrigation opportunities (for example, Meander).

The plans would focus on both governance (partnerships between governments, businesses, and farming communities) and ‘action learning’. Key elements include:

- Cultural change.
- Local land use development plans.

- Skills strategies.
- Access to infrastructure funding.
- Community renewal strategies.

* *The Department of Economic Development and Tourism should be decentralised.* The DEDT is the appropriate agency to sponsor and implement a statewide innovation strategy, along with, in the case of food, the Department of Primary Industry and Water. But as with education innovation, economic innovation cannot be performed from a single central location in Hobart. The DEDT's officers should work in, live in, and be part of local communities. A small number of specific regions of Tasmania—probably as few as five local-government areas at first—should be selected as models for the region-based innovation strategy envisaged here. Each should then be staffed both with DEDT officers, whose task would be business-development and economic facilitation, and appropriate technical-support personnel, in the food sector most likely from DPIW or the Tasmanian Institute of Agricultural Research. These officers should be based in, and live in, the appropriate local town—and *not* attempt to commute from Hobart. To be effective, they will need to become an integral part of the local community, and yet be capable of seamless interaction with the State bureaucracy.

* *A new data collection and analysis capability should be created to assess progress and identify opportunities and obstacles.* Since the future cannot be known with any certainty, it will be essential to be flexible in implementing these initiatives: we will have to adapt to unexpected developments and opportunities. The basis for such adaptation should be objective data, not anecdotes or hunches. At present, however, data on the performance of the Tasmanian economy are often sketchy at the level required to answer these questions, especially at regional levels. The Australian Bureau of Statistics is constrained by confidentiality and budgetary requirements, and does not collect information with the degree of granularity required to support or evaluate a capability-improvement strategy. It will be essential to measure what results the strategy is achieving and to identify trends over time in opportunities and obstacles. To do this, a data collection and analysis capability resident in Tasmania will be essential. It should be able to measure innovation directly, in a continuation of the Innovation Census, and identify trends in employment, value-added, and out-of-state exports, especially for

identified high-potential sectors. This should be combined with publicly available analysis of land-use and other potentials, and data on local community strengthening.

** The strategy should be launched in small number of selected showcase regions.* It is not necessary that these proposals be implemented immediately across the entire state. Indeed, it would be desirable that a select few locations be chosen early as showcases and proofs-of-concept that the system-platform approach to capability improvement proposed here is effective. An ideal way to begin would be to choose at first a handful, perhaps five, high-potential food-producing regions around the state, river valleys in the first instance, to begin implementation. Success in these would encourage others to become involved and provide valuable lessons in the factors that underlie success. In this sense, the 'hydro-agrarianisation' strategy should follow the example of hydro-industrialisation, in which a first example, the Waddamana Power Station, was constructed to demonstrate the strategy's value. With a demonstrated early success, enthusiasm and conviction around the strategy mounted rapidly, providing invaluable public support and understanding. In the present instance, these could be combined with the 'Small Area Development Plans' proposed above.

All these proposals would, of course, require substantial further investigation before adoption, but they illustrate a choice of means by which Tasmania's capability to raise productivity through innovation might be enhanced. As such, they provide a basis for discussion of the way forward.