

*Technical and Methodological Issues*

*in the*

TASMANIAN  
INNOVATION CENSUS

**Tasmanian Innovation Census Working Paper Series**  
TIC/0208

**Technical and Methodological Issues in the  
Tasmanian Innovation Census**

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20 August 2008

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ISSN

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## 1 BACKGROUND

The Tasmanian Innovation Census (TIC) consists of a detailed enterprise level survey of innovation activity in Tasmania. The TIC is not based on a sample survey of the firm population, but a census of all firms with 5 or more employees.

The Census follows the broad guidelines provided by the OECD and Eurostat for such surveys, and covers the following issues:

- Product innovation - development and sales of new products, proportions of sales deriving from new and changed products.
- Process innovation.
- Expenditures on different categories of innovation activities including Research and Development (R&D), design, acquisition of capital goods, training, acquisition of external knowledge, and activities for the market preparation and introduction of product innovations).
- Organisational change.
- R&D performance, classified by objectives and fields of research.
- Extent and types of collaborative behaviour in innovation processes.
- Qualitative information on key innovation outputs and projects among firms.

The census also covers additional enterprise characteristics including:

- Number of business locations and location of business headquarters.
- Proportion of sales by destination (local/interstate/overseas).
- Turnover.
- Number of employees (PT/FT/seasonal/casual).
- Number of tertiary educated employees (including in science and engineering disciplines).
- Level of Government assistance.

## 2 STATISTICAL UNIT

The Enterprise is the statistical unit for the Innovation Census.

Use of the Enterprise as the statistical unit is consistent with conceptual definitions and guidelines in the 'Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data' (Third Edition, 2005).

The Innovation Census statistical unit is also consistent with that of the EU Community Innovation Survey (CIS) and Australian Bureau of Statistics (ABS) national innovation surveys, with some definitional differences.

In the case of the Innovation Census, the statistical unit is equivalent to the observation and reporting unit as defined in the 2005 OSLO manual.

### 2.1 Definition of enterprise

For the Innovation Census, an Enterprise is defined as *“any business entity (sub-entity or branch of a business entity within an enterprise group) engaged in an economic activity, irrespective of its legal form, that has decision making autonomy with respect to innovation”*.

This definition derives from the EU definition of an Enterprise in the 2005 OSLO Manual (p65), and the definition used by the European Commission.

### 2.2 Detailed definition of enterprise

In alignment with the 2005 OSLO manual, two key *definitional criteria* are used to qualify a business entity as an Enterprise for the Tasmanian Innovation Census:

- *Constitutes a business entity or sub-entity engaged in economic activity*
- *Has decision making autonomy in respect to innovation*

As from the 2005 OSLO Manual (p67), the Enterprise as a statistical unit for the Innovation Census includes:

- *Enterprises that are single legal units with one primary economic activity.*

- *Enterprises that are groups of legal units that cannot be considered separate economic entities.*
- *Enterprises that are part of an enterprise group, where decision making on innovation takes place at the enterprise level:*
  - *In some cases for very large enterprises with more than one economic activity, the appropriate primary statistical unit can be kind or type of activity units (KAU/TAU), with the KAU/TAU consisting of one or more legal units, or part of a legal unit.*
  - *For multinational enterprises (MNEs), the domestic units of multinational enterprises are the appropriate statistical units, and may either be an enterprise or part of an enterprise (e.g. a legal unit).*

An Enterprise is not dependent on location. For the innovation census, in many cases the Tasmanian Enterprise will be a single business at a single location but in some cases it will be a business operating at multiple locations. Where the latter is the case, the statistical unit is the Tasmanian Head Office of the business, as that is the level of the business entity with assumed *decision making autonomy with respect to innovation*.

In cases where the Head Office is located outside of Tasmania or Australia, this is the unit that is surveyed where possible.

### **3 SCOPE AND COVERAGE**

The scope of the Innovation Census is all Enterprises in Tasmania with 5 or more employees, except the following:

- Non-profit organisations:
  - Educational institutions (schools, colleges).
  - Associations, societies, clubs.
  - Charities.
  - Public organisations (government services, government agencies, local councils).

Government Business Enterprises and State owned companies are in scope, as they are profit-making organisations seeking commercial returns.

For Census scoping purposes, a Part Time employee is considered as 50% of a Full Time employee, and irregular and seasonal employees are equated to a percentage of a Full Time employee.

## **4 REFERENCE PERIOD**

The main reference period for the Innovation Census is the three-year calendar period 2004-2006. Financial data relates to the most recent financial year ended on or before 30 June 2006. Some data from the census relate to the calendar year 2006.

## **5 POPULATION**

### **5.1 Construction of the census population frame**

Sources of data:

- Tasmanian Department of Economic Development - Biztas database of Tasmanian businesses.
- Dun & Bradstreet - Tasmanian businesses listed in Dunsfile database.
- Industry associations - lists of members.
- Australian Securities and Investment Commission (ASIC) – list of Tasmanian businesses.
- White Pages and Yellow Pages - online databases of businesses.
- Australian Business Register.
- Other administrative datasets.

Population construction:

1. Using the Biztas database as a template the Biztas and Dun & Bradstreet databases were merged together to include company name, contact details, employee numbers and industry codes.
2. A small number of industry associations provided lists of their members and these were added to the database if not already included.
3. Businesses with unknown employee numbers or those on the Biztas database recorded with number of employees as 1<5 (when the next category was 6<9) were identified and assessed with the aim of only including businesses with 5 or more employees:
  - Businesses that were identified as definitely having less than 5 employees from their company description and location were removed from the database – a sample of these were phoned and checked.
  - Businesses that were identified as having 5 or more employees, or where this was uncertain, were retained in the database – any businesses with less than 5 employees

remaining in the database were discounted through subsequent investigation or at the point of data collection.

4. Non-profit companies (associations, charities, clubs, education and government organisations) were identified and removed from the database.
5. White Pages were used to identify large companies operating in Tasmania with headquarters on the mainland that were not included in the Biztas or Dun & Bradstreet databases.
6. The 1993 Australian and New Zealand Standard Industrial Classification (ANZSIC) codes used in the Biztas database were converted to the current 2006 ANZSIC codes.
7. The Standard Industrial Classification (SIC) codes used in the Dun & Bradstreet database were converted into the current 2006 ANZSIC codes.
8. Remaining businesses that did not include an ANZSIC or SIC code were identified, checked and coded with appropriate 2006 ANZSIC codes.
9. The data was cleaned extensively for accuracy of content
  - Businesses with more than one branch listed were identified and only the main branch/headquarters included.
  - Duplicates were identified and removed.
  - All details including address, phone number and other contact details were checked for errors and consistency.

These activities led to an initial database of approximately 4,700 firms. Subsequent investigation and population maintenance resulted in approximately 1,900 of these firms being removed as ineligible/out of scope: either dead, not trading, duplicates, or with less than 5 employees. This left a final population of 2,807 firms.

## **6 DATA COLLECTION METHODOLOGY**

The TIC was based on an innovation questionnaire, administered via Computer Assisted Telephone Interviews (CATI).

The questionnaire is based partly on the EU CIS instrument and was intended to be broadly compatible with both the CIS and ABS innovation surveys.

As it was based on written innovation survey questionnaires, the TIC was tested and refined through a pilot phase to adjust the instrument for the CATI environment.

A pilot study was conducted in early 2007, with the questionnaire field tested on approximately 60 firms in a specific region. This demonstrated the validity of the instrument and the capacity to administer the questionnaire in a reasonable time frame, and enabled a number of final questionnaire revisions before full implementation.

The CATI method had a positive impact on response rates, as interviewers were able to engage participation and explain the broader definition of innovation that includes activities not limited to high-technology types of innovation.

## 7 RESPONSE

There were 1591 responding firms in the final innovation census population list of 2807 firms, giving an overall response rate of 56.7%.

As can be seen in table 1 below, there was no significant variation in response across industry, with a standard deviation around the overall response rate of 8.63%, implying a very low coefficient of variation of 0.15.

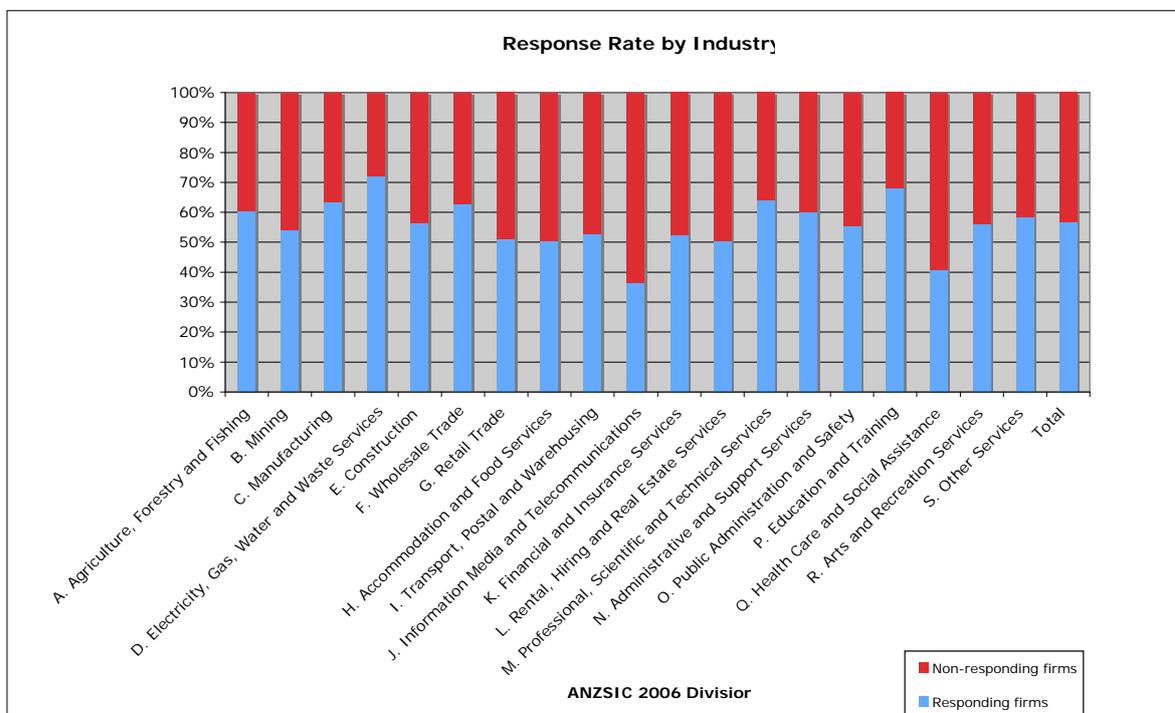


Table 1.

## **7.1 Follow up strategies**

Multiple follow up strategies were implemented to maximise response, including two follow up reminder letters (customised by industry and location), email reminders and multiple telephone contact attempts.

A written version of the questionnaire was utilised as a fallback measure to engage participation for borderline refusals. This was faxed, posted or emailed to respondents. This follow up method had a success rate of approximately 10%.

## **8 DATA PROCESSING**

### **8.1 Size class output classification**

Size-class classifications were based on number of Full Time Equivalent (FTE) employees in the last pay period ending December 2006. FTE was derived by summing:

- The number of full time employees (35 hours or more per week).
- The number of part time employees (less than 35 hours per week on a regular basis) \* 0.5.
- Yearly FTE estimate given for employee's who were seasonal or working irregular hours.

Firm size categories selected were the same as those used for ABS 2003 national innovation survey data (ABS cat. no. 8163.0):

- 5-9 FTE
- 10-19 FTE
- 20-49 FTE
- 50-99 FTE
- 100-249 FTE
- 250+ FTE

### **8.2 Industry class output classification**

Firms were assigned an industry classification by coding the main income earning activity with the Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 codes.

The Australian Bureau of Statistics (ABS) provided technical assistance in standard coding methodology. In addition, two ABS resources aided coding:

- The Australian and New Zealand Standard Industrial Classification (ANZSIC) (ABS cat. no. 1292.0).
- The Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 Coder (ABS cat. no. 1292.0.30.001) - a computer-based coding program.

Standard coding methodology determines that ANZSIC codes are assigned according to the predominant activity of a firm, which generally aligns with the main income earning activity of a firm. This was determined predominantly from the census questionnaire that asked a standard ABS/ATO question used for deriving ANZSIC. Standard ANZSIC coding processes were utilised, with other information sources supplementing questionnaire responses where necessary. Census data was coded to ANZSIC 2006 class (4 digit) level.

### **8.3 “Most important innovation” output classification**

1. The Tasmanian Innovation Census asked an open-ended question at the conclusion of the interview, asking respondents to describe in their own words their “most important innovation”. Nearly 1100 firms (that is, about 65% of all respondents) responded to this question with an applicable answer (about 400 firms gave no response or a non applicable response). This note is about the classification of the answers to this question.

2. The answers are often very illuminating in relation to individual responses to the survey. The fundamental problem with this kind of question, however, is how to classify the responses in order to make them comparable and hence useful at the population level.

3. There is no simple route towards classifying the answers, because “innovation” is a complex activity that includes technological, organisational and economic elements. It is not possible to classify by any one of these dimensions because other factors may come into play. For example, the patent classification for inventions is a set of technical functions that can be used to sort patents into technological fields. But innovation is not invention: a key point is that a new technology, service or organisation must be implemented – either by introducing it to the market or by setting it to work in a new process. This means that the

economic domain of the process or final output in which it is implemented may be the relevant classification category. We also need to bear in mind that innovations may be products, processes, new forms of organisation, or new markets or marketing methods. So introducing a new form of lighting may be a product (a new lamp), part of a process change (in a workplace), or part of a product that incorporates lighting (such as a vehicle), or part of a service (such as a cinema or a car park).

4. The overall problem is therefore multidimensional, and any classification approach must be to some extent arbitrary. We have used two ways of classifying: a ‘vertical’ classification, which sorts innovations by their “industry innovation field”, and a horizontal one which sorts organisational innovations that might occur across a wide range of industries.

5. The vertical approach is to classify all products and technical processes according to what we call the “industry innovation field” which is defined by the final output to which they contribute. The industry innovation field is the broad set of technologies and technical services that make up the totality of the technology of final output of an industry. So the “industry innovation fields” are in effect technologies related to the industrial structure – they broadly correspond to 18 of the 19 ANZSIC divisions (the missing division is Public Administration and Safety) (The ANSZIC Industry Structure classification is attached).

6. The horizontal classification divides organisational changes into two broad types: those related to business process, and those related to human resources.

7. There are three partial exceptions to this approach. The first concerns Information and Communication Technologies (ICT’s). Where an ICT product or application is clearly being sold as a product to other firms and industries it is classified under “ICT systems, applications and services”. Where an ICT application is implemented by a firm in its organisation or processes it is classified according to the final output being produced, but sub-classified as an ICT input. This enables us to produce a complete overview of ICT innovations. The second concerns any innovation that may have a beneficial environmental objective or impact. This is classified similarly to ICT: according to final output, but with a sub classification identifying it as an environmental innovation. The third concerns marketing innovations, where there is a subcategory “Opening New markets”. The fourth concerns Wine (an important Tasmanian

product), is classified under Food and Beverages, but also sub-classified separately.

9. Finally, using the reviewer's judgement, innovations are classified into two categories: Adoption and New Technology. The latter is in turn divided into two grades of importance: "incremental", meaning a relatively minor improvement or upgrade to existing products or practices, and "significant" indicating a learning and technology break with what has come before. This final division is difficult to draw from the available material, and is intended to be indicative only.

So the classification is as follows:

- Industry Innovation Field
  - ICT application
  - Environmental application
  - Wine related
- Organisational Innovation Field
  - ICT application
  - Environmental application
- Marketing innovation
  - Opening new markets
- Innovation type:
  - User-developed
  - Adoption
  - New technology incremental
  - New technology significant
- None reported
- Not applicable

## Most important innovations

<b>Industry innovation fields</b>	<b>Relevant ANZSIC Division</b>
Agricultural and horticultural products and technologies	A
Power generation and transmission	D
Transport equipment (including air and maritime) and services, packaging and logistics	I, F
Manufacturing and workshop processes (inc. machinery improvements and upgrading)	C
Tourism, hospitality, leisure products and services (includes restaurant and café technologies)	H, R
Construction/building technology including interior design and furniture	E
Financial, business, design and property services;	K, L
ICT systems, applications and services	J
Textiles, Clothing and footwear	C
Forestry, timber, pulp, paper and related technologies	A
Aquaculture and fishing products and technologies (including new species)	A
Food and beverage products and processing	A
Sub category: wine	
Health products and services (inc. child and aged care)	Q
Printing and publishing; advertising; media	J
Mining and metals	B
Environmental and Research services	M
<b>Organisational innovation fields</b>	
Business processes, models and services (Includes premises/infrastructure, work organisation and management practices)	N, O
Human resources, training, education, OHS	P, O
<b>Marketing innovations</b>	
Retail and Customer services and marketing Sub category: opening new markets	Sub G
None reported or not applicable	
Other and undisclosable	
Total	

## 8.4 Data derivations

Two main types of derivations were calculated from the census data. The first type involved deriving figure responses from *percentage* or *category range* responses.

As a fallback option for respondents having difficulty providing figure estimates as answers, the census questionnaire provided the option of answering as a percentage or category range for some questions (i.e. as a percentage of turnover for expenditure, a category range for turnover, or a percentage of all employees for number of tertiary educated employees).

For percentage responses to expenditure questions, a figure estimate was derived by multiplying the percentage response by the turnover figure (for firms with turnover). A very small proportion of firms provided expenditure as a proportion of turnover and did not provide turnover, these were considered as item non-response for innovation expenditure outputs based on dollar expenditure.

Innovation sales figures were derived from sales proportions (provided as a percentage of 2005-06 turnovers) for:

- Sales from goods or services that were unchanged or only marginally modified.
- Sales from goods or services that were significantly improved.
- Sales from goods or services that were new to the enterprise but not to the market.
- Sales from goods or services that were new to the market.

For a small number of respondents providing turnover as a category range only, an estimate was derived for each range response as follows:

- \$1 Million or less = 500000
- \$5 Million or less = 2500000
- \$10 Million or less = 5000000
- \$50 Million or less = 25000000
- \$100 Million or less = 50000000
- Over \$100 Million = 150000000

For a very small number of firms responses to number of tertiary employees was expressed as a percentage (of total number of employees). In these cases, the number of tertiary qualified employees was derived by multiplying the percentage response by the number of FTE employees.

The second type of derivation involved deriving new *variables* from questionnaire responses. Most of these are standard to innovation surveys, and are included under definitions.

## **8.5 Data editing**

Inaccuracies in data can occur for a number of reasons including erroneous or inaccurate reporting by businesses, errors in data capture and errors in processing.

A comprehensive set of data quality measures were implemented before, during and after data collection to maximise quality.

Data editing consisted of a number of phases. Initial response data was cleaned extensively, rectifying any formatting inconsistencies and recoding raw data for further editing and processing. Relevant derivations were then run prior to implementing input and output editing processes.

A systematic non-response analysis was conducted to test for response bias, which is discussed below.

## **8.6 Item non-response**

Imputation was not applied to the data due to the nature of the preliminary outputs and the low item non-response (less than 10% for most questions). An imputation strategy may be enacted in the future depending on the nature of outputs required for future research.

# **9 DATA QUALITY**

## **9.1 Non-response analysis**

A systematic non-response analysis was conducted to test for the presence of response bias in the data. The intention was to test whether the non-responding population was biased towards a higher proportion of non innovation-active firms. If this were the case, then the proportion of innovation-active firms in the responding population would have been inflated.

A sample survey of non-responding firms was undertaken, with methodological advice provided by the Australian Bureau of Statistics regarding sampling design and analysis.

The result of the non-response sample survey was an estimated proportion of innovation-active firms that was marginally higher than the estimate for the responding population.

The non-response analysis concluded that there is no statistically significant response bias in the data regarding the proportion of innovation-active firms. There is no statistical evidence indicating that the proportion of innovation-active firms in the responding and non-responding populations are statistically significantly different. The non-response sample size was sufficiently large to support these findings.

## **9.2 Comparisons with alternative data sources**

Comparison of results with other data sources should always be treated with caution, taking into account any differences in scope, coverage, definitions and methodologies. Below some of the main differences between the TIC, CIS and ABS national innovation surveys are noted.

A key difference in the scope and coverage of the innovation census with other collections is that it is a census rather than a sample survey – attempting to survey all firms in the target population rather than a sample of the target firm population.

The TIC includes all firms with 5 or more employees as with ABS surveys, where CIS scope includes firms with 10 or more employees.

Because it is a census, by definition it also covers all industries and all economic activities. ABS and CIS innovation surveys differ in industry sector coverage, with both excluding selected industry sectors.

The TIC definition of innovation-active is equivalent to the CIS definition - an innovation-active firm is one that has implemented new goods, services or operational processes - so shares the same definitional differences as the ABS and CIS. New or significant changes in organisational/managerial innovations are defined separately as 'wider innovations'.

As with the CIS the TIC uses a three-year reference period for implementation of innovations, where the ABS uses a 2-year period.

The TIC has a key difference in the collection methodology, which consisted of Computer Assisted Telephone Interviews (CATI), where both ABS and CIS surveys use written mail-out questionnaires. The TIC also differed from ABS and CIS surveys in that it collected some qualitative data on 'most important innovations'.

## 10 RELEVANT DEFINITIONS

- **Products:** goods or services
- **Innovation-active firm:** produced new or significantly improved products, or introduced any new or significantly improved processes for producing or supplying products
- **Non-innovation active firm:** *did not* produce new or significantly improved products, and *did not* introduce any new or significantly improved processes for producing or supplying products
- **Wider innovator:** implemented a new or significantly changed corporate strategy, advanced management techniques, major changes to organisational structure, or changes in marketing concepts or strategies
- **Broader innovator:** an enterprise that is innovation active, a wider innovator, or both
- **Product innovator:** produced new or significantly improved goods or services
- **Goods product innovator:** produced new or significantly improved goods
- **Services product innovator:** produced new or significantly improved services
- **Good and service product innovator:** produced new or significantly improved goods and services
- **Novel product innovator:** introduced a new good or service onto the market before competitors (i.e. new to market)
- **Non-novel product innovator:** a product innovator that *did not* introduce a new product onto the market before competitors
- **Process innovator:** introduced any new or significantly improved processes for producing or supplying products
- **Novel process innovator:** introduced any new to industry processes for producing or supplying products

- **Non-novel process innovator:** a process innovator that *did not* introduce any new to industry processes for producing or supplying products (i.e. new to enterprise)
- **Product and process innovator:** firm with both product and process innovation
- **Product or process innovator:** a firm with product or process innovation
- **Future innovator:** a firm that is not innovation-active in the reference period but plans to introduce a new product or process in the following three years
- **Total innovation expenditure:**
  - The sum of expenditure on:
    - In-house research and development
    - Acquisition of research and development from other organisations
    - Acquisition of advanced machinery, equipment, computer hardware or software
    - Acquisition of external knowledge
    - Internal or external training for the development and/or introduction of new or improved products and processes
    - Design activities
    - Activities for the market preparation and introduction of new or improved goods and services
- **All altered products:**
  - Includes products that were:
    - Significantly improved
    - New to the enterprise but not to the market
    - New to the market

## 10.1 ANZSIC 2006 industry division codes and titles

- A Agriculture, Forestry And Fishing
- B Mining
- C Manufacturing
- D Electricity, Gas, Water And Waste Services
- E Construction
- F Wholesale Trade
- G Retail Trade
- H Accommodation And Food Services
- I Transport, Postal And Warehousing
- J Information Media And Telecommunications
- K Financial And Insurance Services

- L Rental, Hiring And Real Estate Services
- M Professional, Scientific And Technical Services
- N Administrative And Support Services
- O Public Administration And Safety
- P Education And Training
- Q Health Care And Social Assistance
- R Arts And Recreation Services
- S Other Services

## **11 PRIVACY AND CONFIDENTIALITY**

All data collected as part of the TIC is protected by privacy and confidentiality policy and legislation, and no individual or organisation who participated in the TIC can be identified from the data outputs. Only research members of AIRC may use the disaggregated data set and all are required to sign a confidentiality agreement, which is attached as Appendix A.

## **APPENDIX A: Census confidentiality agreement**

THIS Deed made the                      day    2008

BETWEEN:

**University of Tasmania**, a body corporate continued under the *University of Tasmania Act 1992*, as represented by the **Australian Innovation Research Centre** of Private Bag 108, Hobart (referred to in this agreement as "AIRC")

**AND**

*(insert full name/company details and address)*  
(referred to in this agreement as "the Researcher")

### **BACKGROUND:**

- A. AIRC has undertaken a survey of Tasmanian firms to explore new product innovation and investment in new technologies in Tasmania
- B. Data collected by AIRC during the course of the survey has been populated into a database for future research purposes ("the data").
- C. AIRC is bound by the *Privacy Act 1988* (Commonwealth) and the *Personal Information Protection Act 2004* (Tasmania) to ensure that no organisation or individual person who participated in the survey can be identified from data out put.
- D. The Researcher has requested access to the data for the purpose of the research detailed in the schedule attached and marked "Research Schedule" ("the Approved Purpose").
- E. AIRC agrees to permit the Researcher access to the data on the terms of this agreement.
- F. The Researcher has agreed to keep secret and confidential AIRC's confidential information in accordance with the terms of this agreement.

### **AGREEMENT**

#### **1. Definitions**

"Confidential Information" means, regardless of the form of disclosure or the medium used to store it, all information disclosed by AIRC to the Researcher or otherwise through the Researchers involvement with AIRC, and includes without limitation:

- (a) All raw census data collected by or on behalf of AIRC;
- (b) The population database and its elements;
- (c) The data generated by the raw census data and the population data base elements
- (d) Enhanced products generated from the data base

Confidential Information does not include information which:

- At the date of this agreement is in the public domain.
- Which, after disclosure to the Researcher comes into the public domain otherwise than by disclosure in breach of the terms of this agreement;
- Information which the Researcher can prove was previously known by the Researcher and was not acquired directly or indirectly from AIRC;
- Information which the Researcher received from a third party which was not received directly or indirectly from AIRC in breach of an obligation of confidence owed by the third party.
- Is required by law to be disclosed

The burden of showing that any information is not Confidential Information in this agreement rests with the Researcher.

## 2. Term of Agreement

Unless otherwise agreed by AIRC in writing, the rights of the Researcher to use the Confidential Information for the Approved Purpose end:

- 2.1. on completion of the Approved Purpose, or
- 2.2. within (“insert period of agreed access to data”) days/months/years of the date of this agreement, or
- 2.3. on service of a notice of termination on the Researcher by AIRC for a breach of the agreement, which ever occurs first. (“the termination date”).

The Researcher’s rights to access the Confidential Information will immediately cease on the date this agreement is terminated.

## 3. Researcher’s Obligations

In consideration of AIRC disclosing the Confidential Information to the Researcher, the Researcher agrees that **the Researcher has a duty to keep confidential all Confidential Information disclosed to the Researcher.**

3.1. The Researcher must:

- 3.1.1. use the Confidential Information only for the Approved Purpose as detailed in the Research Schedule;
- 3.1.2. not use the Confidential Information for any commercial purpose without the prior written approval of AIRC. In giving approval, AIRC may impose on the Researcher terms on which the Researcher is permitted to use the Confidential Information for commercial purposes.

In this Agreement, “Commercial Purpose” means:

- make the Confidential Information available to a third party by sale or otherwise;

- sell products derived from or incorporating the Confidential Information;
- use the Confidential Information to derive income or gain a financial return for the Researcher or a third party.

- 3.1.3. obtain the approval of AIRC to any proposal to commercialise any of the results of the research that use the Confidential Information prior to commencing any commercialisation activity;
- 3.1.4. not make any direct or indirect contact with any of the respondents to the census survey undertaken by AIRC and from which the raw census data was obtained;
- 3.1.5. not copy or record in any other form any part of the Confidential Information except as approved by AIRC as necessary for the approved purpose;
- 3.1.6. not directly or indirectly exploit the Confidential Information in any way for the benefit, profit or advantage of the Researcher or any other party;
- 3.1.7. not use the Confidential Information to solicit business from any of the participants in the census survey which provided the raw census data to AIRC;
- 3.1.8. not use the Confidential Information to develop technology the same or similar to the Confidential Information;
- 3.1.9. not make any statement or announcement concerning any matter under this agreement unless such statement or announcement is first approved in writing as to timing and content by AIRC;
- 3.1.10. establish to the satisfaction of AIRC, internal security procedures to prevent any unauthorised access to the Confidential Information. Any Confidential Information stored by the Researcher on central systems must be subject to encryption;
- 3.1.11. notify AIRC in writing of any errors found in the Confidential Information.

### **3.2. Disclosure to Employees, Consultants, Contractors and Sub-Contractors**

The Researcher must

- 3.2.1. only disclose Confidential Information to the Researcher's employees to the extent necessary for the employees to perform their duties for the approved purpose;
- 3.2.2. ensure that the Researcher's employees keep the Confidential Information confidential and do not do anything which if done by the Researcher, would be a breach by the Researcher of this Agreement;
- 3.2.3. bind the Researcher's employees to the terms of this agreement;
- 3.2.4. only with the prior written approval of AIRC, permit consultants, contractors or sub-contractors with which the Researcher has contracted for the provision of specific services, to use, copy, reproduce or adapt the Confidential Information. If approved by AIRC, the Researcher must ensure that the contract between the Researcher and the Researcher's consultant, contractor or sub contractor includes the obligations specified in this agreement.

## **4. Ownership of Confidential Information**

- 4.1. The Researcher acknowledges that this agreement does not:
  - 4.1.1. transfer to the Researcher any proprietary rights of any kind to any Confidential Information as a result of a disclosure under this agreement;
  - 4.1.2. oblige AIRC to disclose any Confidential Information to the Researcher;
- 4.2. the Researcher agrees that, unless otherwise advised in writing by AIRC, the Researcher will acknowledge AIRC as being the source provider of the Confidential Information in any publication, papers, reports or project outcomes produced as a result of or in relation to the Researcher's use of the Confidential Information.
- 4.3. all publications, papers, reports or project outcomes, which make use of the Confidential Information, are to be submitted to AIRC at least 60 days prior to publication. AIRC will notify the Researcher of any amendments which need to be made pursuant to any

obligations agreed to at the time of the approved use. This provision is required to ensure that no sensitive or Confidential Information is disclosed.

## **5. Return of Information**

- 5.1. On the termination date, the Researcher must immediately, at AIRC's option:
  - 5.1.1. return to AIRC all Confidential Information (including all extracts and copies) stored in any medium;
  - 5.1.2. destroy the Confidential Information and permit AIRC to witness its destruction;
  - 5.1.3. delete the Confidential Information in the case of machine-readable records.
- 5.2. When the Researcher has complied with its obligations to return information, the Researcher must certify to AIRC in writing that all Confidential Information has been returned to AIRC, destroyed or deleted.

## **6. Default**

- 6.1. Should any of the terms of this agreement be breached by the Researcher, AIRC may, by written notice:
  - 6.1.1. immediately terminate this Agreement if the breach is considered by AIRC as substantial and request the return or destruction of the Confidential Information in accordance with clause 4; or
  - 6.1.2. require the Researcher to remedy the breach.
- 6.2. If the Researcher fails to remedy the breach in the time specified in the notice, AIRC may by notice to the Researcher terminate this agreement immediately ("termination notice").
- 6.3. The Researcher acknowledges that default under this agreement may cause AIRC irreparable harm and significant injury that may be difficult to ascertain and for which monetary damages may not be adequate compensation. Accordingly, the Researcher agrees that AIRC has the right to seek and obtain immediate injunctive relief to enforce the Researcher's obligations under this agreement in addition to any other rights or remedies that AIRC may have against the Researcher.

## **7. Indemnity**

- 7.1. the Researcher agrees to pay on demand to AIRC, any costs associated with the collation and transfer of the Confidential Information under the terms of this agreement. The costs do not include any fee for the use of the Confidential Information or for the costs associated with the original collection of the Confidential Information, for which there is no charge.
- 7.2. The Researcher indemnifies AIRC against all losses and liabilities that are or may be incurred by AIRC, and all legal costs and other expenses incurred by AIRC in connection with a demand, action or other proceedings arising as a result of the use of the Confidential Information by the Researcher or a breach of any terms of this agreement.

## **8. Disclaimer**

Whilst AIRC endeavours to ensure that the Confidential Information is correct, no warranty either express or implied is given as to its accuracy and AIRC does not accept any liability for any errors or omissions contained within the Confidential Information. AIRC will not be liable for any damages (including but not limited to damages for loss of business or loss of profits) arising from accessing the Confidential Information or the inability to access the Confidential Information.

## **9. Disputes**

The parties agree that in the event of a dispute, they will negotiate in good faith to resolve the dispute. If the dispute has not been resolved by negotiation within a reasonable period, either party may refer the dispute to mediation and will do so before initiating proceedings in a court to resolve the dispute.

## **10. Continuing Obligations**

The Researcher acknowledges that the obligations of confidentiality under this agreement continue to apply to the Researcher even if:

- 10.1. the approved purpose is completed or terminated; and
- 10.2. the Researcher has returned, destroyed or deleted the Confidential Information.

The Researcher's obligations under this agreement shall not merge in any subsequent agreement between the parties in the absence of written provision to that effect.

## **11. General**

- 11.1. **Jurisdiction**  
This agreement is governed by the laws of the state of Tasmania and each party submits to the jurisdiction of the Courts of that State.
- 11.2. **Amendments**  
This agreement may be amended only by a written document signed by the parties.
- 11.3. **The Researcher may not assign or transfer all or any of its rights or obligations under this Agreement without the prior written consent of AIRC.**

Executed as a deed:

SIGNED for and on behalf of the University  
of Tasmania by its duly authorised representative

in the presence of:

SIGNED SEALED AND DELIVERED

by  
in the presence of:

Research Schedule

## **12 APPENDIX B: Innovation census questionnaire**

(Note: This written version was adapted for use in the CATI environment)

[ID]

[business name]

[contact name] - New Contact : \_\_\_\_\_

[address]

[phone]

### **[ANZSIC Division] Tasmanian Innovation Census Survey Questionnaire**

Version 2.7 - 9 August 2007

**Australian Innovation Research Centre  
University of Tasmania**

Time actual interview started \_\_\_\_: \_\_\_\_ 24 hour time

Date started \_\_\_\_ / \_\_\_\_ / 2007

Good morning/afternoon, I'm calling on behalf of the Australian Innovation research Centre at the University of Tasmania.

I'm calling about an innovation project that the University of Tasmania is currently undertaking in collaboration with the Department of Economic Development.

Recently a letter was sent explaining the project, did you get a chance to read that letter?

The project aims to study innovation across different industries in Tasmania, exploring the development of new products and processes in Tasmanian businesses.

It aims to provide researchers and Policy makers with an understanding of what innovation is occurring in Tasmania, so that they can develop better forms of support for Tasmanian firms, and better policies to support innovation in Tasmania and improve the Tasmanian economy.

What the project involves is a short telephone questionnaire. It takes around 10 to 20 minutes. Would you be willing to participate in the survey now? [If no] Would it be possible to schedule a time to complete the questionnaire?

In this survey, the questions are about [business name]'s whole business enterprise in Tasmania.

Q1. To start with, could you describe the activity from which [business name] derives its main income?

---

---

---

Q2a. Is [business name] part of an enterprise group, that is, two or more enterprises under common ownership?

*Please cross one box only*

Yes

No

Q2b. Is your headquarters in Tasmania, in mainland Australia or Outside of Australia:

*Please cross one box only*

In Tasmania

In Mainland Australia

Outside of Australia

(If the enterprise is part of an enterprise group) In the rest of these questions "your enterprise" refers only to [business name] in Tasmania.

**Q2c. Does [business name] have more than one location or establishment in Tasmania?**

*Please cross one box only*

Yes

No  → Go to <sup>8</sup>

**Q2d. (If yes) What was the number of locations operated by [business name] as at 30 December 2006?**

\_\_\_\_\_

The next question asks for the percentage distribution of sales revenue between markets in Tasmania, Australia and Overseas.

**Q3. Please estimate the percentage of your revenues in the 2005-2006 Financial Year (ended June 30 2006) that came from the sale of goods or services in:**

- a. Tasmania \_\_\_\_\_%
- b. Mainland Australia \_\_\_\_\_%
- c. Outside of Australia \_\_\_\_\_%

**The next section is about new or improved goods or services at [business name]**

*When we say that, we are talking about the market introduction of a good or service that is new or significantly improved.*

*That could mean that the good or service is completely new and different to goods or services previously produced by the enterprise.*

*That can also mean that the good or service is significantly improved in terms of quality, functions or intended uses; or significantly improved through changes in materials, components, design, or other characteristics that enhance performance.*

*For example, we would exclude superficial changes (such as new colours or patterns on a label), but include new packaging that improves shelf-life, or reduces costs.*

*The new good or service does not need to be new to your market, only to your enterprise, and it does not matter if the new good or service was originally developed by your enterprise, or by other enterprises.*

*We don't include the simple resale of new goods purchased from other enterprises.*

**Q4. During the past three calendar years, 2004, 2005 and 2006, did your enterprise introduce:**

		Yes	No
a.	New or significantly improved goods.	<input type="checkbox"/>	<input type="checkbox"/>
b.	New or significantly improved services	<input type="checkbox"/>	<input type="checkbox"/>

**( If 'no' to both options above go to Question 8, otherwise Q5a: )**

**Q5a. During the 3 years from 2004 to 2006, were any of these goods or services new to your market, that is where your enterprise introduced a new good or service onto your market before your competitors?**

*Please cross one box only*

Yes

No

**Q5b. During the 3 years from 2004 to 2006, were any of these goods or services only new to your enterprise, that is where you introduced a new good or service similar to a product already available from your competitors?**

*Please cross one box only*

Yes

No

**The next question applies to goods or services during the three calendar years 2004 to 2006.**

**The question asks how much of your turnover is due to goods or services that were unchanged during 2004 to 2006, and how much of your turnover is due to goods or services introduced during 2004 to 2006 that were new or improved.**

**We ask about turnover for the 2005-2006 financial year only (ended June 30 2006), and we ask for a percentage of turnover.**

**We are interested in the distribution of turnover between sales of goods or services that were unchanged, significantly improved, new to your enterprise but not your market, and new to your market.**

**Q6.**

a. What percentage of your 2005-2006 turnover, was from goods \_\_\_\_\_%  
or services that were **unchanged**, or only marginally modified  
during 2004 to 2006?

b. What percentage of your 2005-2006 turnover, was from goods \_\_\_\_\_%  
or services introduced during 2004 to 2006, that were  
**significantly improved?**

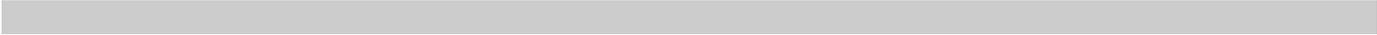
c. What percentage of your 2005-2006 turnover, was from goods \_\_\_\_\_%  
or services introduced during 2004 to 2006, that were **new to your  
enterprise but not to your market?**

d. What percentage of your 2005-2006 turnover, was from goods \_\_\_\_\_%  
or services introduced during 2004 to 2006 that were **new to your  
market?**

**Total turnover in 2006** 100%

**Q7. During the past three calendar years 2004 to 2006, were any of [business name]'s new or improved goods or services sold to the following industries in Tasmania?**

Yes No

- |  |                          |                          |
|--|--------------------------|--------------------------|
| a. The mining industry                                     | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Engineering   | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Forestry or forest products (i.e. wood, pulp and paper) | <input type="checkbox"/> | <input type="checkbox"/> |
| d. The food processing industry                            | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Fishing or Aquaculture                                  | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Agriculture or horticulture                             | <input type="checkbox"/> | <input type="checkbox"/> |
| g. The wine industry                                       | <input type="checkbox"/> | <input type="checkbox"/> |
- 

**The next section is about Process Change**

A New Process is the use of new or significantly improved **methods** for the production or supply of goods and services. Purely organisational or managerial changes should not be included - these will be covered shortly.

The new process must be new to your enterprise, but it does not need to be new to your industry. Again, it does not matter if the new process was originally developed by your enterprise or by other enterprises.

**Q8a. During the three calendar years 2004 to 2006, did your enterprise introduce any new or improved processes for producing or supplying goods or services?**

Yes   
 No  → **Question**

**Q8b. Were any of these processes new only to your enterprise and not to the industry?**

Yes   
 No

**Q8c. Were any of these processes new to the industry?**

Yes   
 No

**Q9. Does [business name] plan to introduce a new good, service or process within the next three calendar years 2007, 2008 or 2009?**

*Please cross one box only*

Yes   
 No

**Now a few questions about expenditure**

**Q10, Q11, Q12. During the three years 2004 to 2006, did your enterprise engage in [...]? (When 'yes') What was your approximate expenditure on [...] in the 2005/6 financial year only?**

*Please cross one box for each category*

		Yes	No	\$ 2005/6	% of Turnover in 2005/2006 Financial year
a.	<b>In-house research and development for new products or processes, that is, creative work undertaken within your enterprise on an occasional or regular basis to increase the stock of knowledge and its use to devise new and improved goods, services and processes</b>	<input type="checkbox"/>	<input type="checkbox"/> If no skip to Q15		

The next questions ask for a “yes” or “no” response to a number of answer categories.

**Q13. Does your enterprise’s in-house R&D fall into any of the following application areas?**

	<b>Application area</b>	<b>Yes</b>	<b>No</b>
a.	<b>Plant production and plant products</b>	<input type="checkbox"/>	<input type="checkbox"/>
b.	<b>Animal production and animal products</b>	<input type="checkbox"/>	<input type="checkbox"/>
c.	<b>Mineral resources excluding energy</b>	<input type="checkbox"/>	<input type="checkbox"/>
d.	<b>Energy resources</b>	<input type="checkbox"/>	<input type="checkbox"/>
e.	<b>Energy supply</b>	<input type="checkbox"/>	<input type="checkbox"/>
f.	<b>Manufacturing</b>	<input type="checkbox"/>	<input type="checkbox"/>
g.	<b>Construction</b>	<input type="checkbox"/>	<input type="checkbox"/>
h.	<b>Transport</b>	<input type="checkbox"/>	<input type="checkbox"/>
i.	<b>Information and Communication services</b>	<input type="checkbox"/>	<input type="checkbox"/>
j.	<b>Commercial services and tourism</b>	<input type="checkbox"/>	<input type="checkbox"/>
k.	<b>Other application area not mentioned</b>	<input type="checkbox"/>	<input type="checkbox"/>

**Q14. Does your enterprise’s in-house R&D fall into any of the following research fields?**

	<b>Research fields</b>	<b>Yes</b>	<b>No</b>
a.	<b>Mathematical sciences</b>	<input type="checkbox"/>	<input type="checkbox"/>
b.	<b>Physical sciences</b>	<input type="checkbox"/>	<input type="checkbox"/>
c.	<b>Chemical sciences</b>	<input type="checkbox"/>	<input type="checkbox"/>
d.	<b>Earth sciences</b>	<input type="checkbox"/>	<input type="checkbox"/>
e.	<b>Biological sciences</b>	<input type="checkbox"/>	<input type="checkbox"/>
f.	<b>Information, Computing and Communication Sciences</b>	<input type="checkbox"/>	<input type="checkbox"/>
g.	<b>Engineering and Technology</b>	<input type="checkbox"/>	<input type="checkbox"/>
h.	<b>Agricultural, Urban environment and Building</b>	<input type="checkbox"/>	<input type="checkbox"/>
i.	<b>Medical and Health Sciences</b>	<input type="checkbox"/>	<input type="checkbox"/>
j.	<b>Other research field not mentioned</b>	<input type="checkbox"/>	<input type="checkbox"/>

**Q15, Q16, Q17. During the three calendar years 2004 to 2006, did your enterprise engage in [...]?**  
**(When 'yes') What was your approximate expenditure on [...] in the 2005/6 financial year only?**

		Yes	No	\$ 2005/6	% of Turnover in 2005/2006 Financial year
<b>b.</b>	<b>Acquisition of research and development from other organisations, that is, R&amp;D purchased by your enterprise and performed by other companies, including other enterprises within your group or by public or private research organisations.</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>c.</b>	<b>Acquisition of advanced machinery, equipment, computer hardware or software to produce new or improved goods, services, production processes, or delivery methods</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>d.</b>	<b>Acquisition of external knowledge: Purchase or licensing of patents and non-patented inventions, know-how, and other types of knowledge from other enterprises or organisations.</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>e.</b>	<b>Internal or external training for your personnel specifically for the development and/or introduction of new or improved goods, services and processes.</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>f.</b>	<b>Design activities, outside of the R&amp;D phase for the development or implementation of new or improved goods, services and processes.</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>g.</b>	<b>Activities for the market preparation and introduction of new or improved goods and services, including market research and launch advertising.</b>	<input type="checkbox"/>	<input type="checkbox"/>		

The next question is about collaboration. We define collaboration as active participation with other enterprises or non-commercial institutions aimed at developing new goods, services or processes. Both partners do not need to benefit commercially, or share risks. Exclude pure contracting out of work with no active collaboration.

**Q18. Did [business name] engage in any collaboration with other enterprises or institutes during the three calendar years 2004 to 2006?**

Yes

No  → Question 19

The next question asks for a “yes” or “no” response to whether your enterprise has collaboration partners, and whether they were located in Tasmania, Australia or Outside of Australia. Collaboration partners can be in more than one location.

**Q19. Did [business name] collaborate with (read for each category a to g).**

**(If ‘yes’ ask ) Were they located - within Tasmania ... in Mainland Australia ... Outside of Australia?**

*Please cross all that apply*

Type of collaboration partner		Within Tasmania	Mainland Australia	Outside of Australia
<b>a.</b>	Other enterprises within your enterprise group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>b.</b>	Suppliers of equipment, materials, services, or software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>c.</b>	Clients or customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>d.</b>	Competitors or other enterprises in your industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>e.</b>	Consultants, commercial labs, or private R&D institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>f.</b>	Universities or other higher education institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>g.</b>	Public research institutes or CRCs (Cooperative Research Centres)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The next section is about support received for the development of new goods, services or processes. *(This includes financial support via tax credits or deductions, grants, subsidised loans, and loan guarantees. This excludes research and other innovation activities conducted entirely for the public sector under contract)*

**Q20. During the three calendar years 2004 to 2006, did your enterprise receive any financial support for new good, service, or process development activities from [ a and b below ]?**

	Yes	No
a. State government authorities	<input type="checkbox"/>	<input type="checkbox"/>
b. Federal Government (including their government agencies or ministries)	<input type="checkbox"/>	<input type="checkbox"/>
c. <i>(If yes in a or b)</i> did <b>your enterprise</b> claim a tax credit for R&D performed for any year between 2004 and 2006?	<input type="checkbox"/>	<input type="checkbox"/>

In this next section we ask about new forms of organisation, business structures or practices aimed at improving efficiency, or new approaches to markets and customers.

The question asks for a “yes” or “no” response to a number of answer categories.

**Q21. During the three calendar years 2004 to 2006, did your enterprise make major changes in the following areas of business structure and practices?**

*Please cross one box for each category*

	Yes	No
a. Implementation of a new or significantly changed <b>corporate strategy</b>	<input type="checkbox"/>	<input type="checkbox"/>
b. Implementation of <b>advanced management techniques</b> within your enterprise, e.g. knowledge management systems	<input type="checkbox"/>	<input type="checkbox"/>
c. Implementation of major changes to your <b>organisational structure</b> , e.g. introduction of cross-functional teams, outsourcing of major business functions.	<input type="checkbox"/>	<input type="checkbox"/>
d. Implementation of changes in <b>marketing concepts or strategies</b> (e.g. packaging or presentational changes to a product to target new markets, or new activities to open up new markets)	<input type="checkbox"/>	<input type="checkbox"/>

## And finally some basic economic information about your enterprise

Turnover is defined as the market sales of goods and services based on the amount earned; **include** exports and taxes, but **exclude** GST.

**Q22. What was your enterprise's total turnover from its Tasmanian operations for the 2005-2006 financial year? What was it two years earlier, for the 2003-2004 financial year?**

a. 2005/6

\$ \_\_\_\_\_

b. 2003/4

\$ \_\_\_\_\_

**Informed estimates** are fine if exact figures are not available

*(If unable or unwilling to estimate,)* can you tell us which of the following six broad categories your enterprise falls into? (Read all categories and circle relevant code)

2005-2006	Code	2003-2004	Code
\$1 Million or less	1	\$1 Million or less	1
\$5 Million or less	2	\$5 Million or less	2
\$10 Million or less	3	\$10 Million or less	3
\$50 Million or less	4	\$50 Million or less	4
\$100 Million or less	5	\$100 Million or less	5
Over \$100 Million	6	Over \$100 Million	6

The next question is about the number of employees at [business name].

**Q23. During the last pay period ending in December 2006, how many employees were there who worked [ ask for a to c below ]?**

a.	Full time that is 35 or more Hours per week	
b.	Part time, that is less than 35 hrs per week on a regular basis	
c.	Irregular hours or were there for seasonal work	

If there were employees working irregular hours or there for seasonal work, then ask d:

d.	For employee's working irregular hours or there for seasonal work, could you estimate how many full time people they were the equivalent of during the whole 2006 calendar year?	
----	--	--

Next, we ask the same questions about the number of employees two years earlier:

**Q24. During the last pay period ending in December 2004 how many employees were there who worked [ ask for a to c below ]?**

a.	Full time that is 35 or more Hours per week	
b.	Part time, that is less than 35 hrs per week on a regular basis	
c.	Irregular hours or were there for seasonal work	

If there were employees working irregular hours or there for seasonal work, then ask d:

d.	For employee's working irregular hours or there for seasonal work, could you estimate how many full time people they were the equivalent of during the whole 2004 calendar year?	
----	--	--

**Q25. During the last pay period ending in December 2006, approximately what number of your enterprise's employees were educated to degree level or above in science or engineering subjects? ... What about other subjects?**

Note: If respondent has difficulty providing a number, then ask if they can provide their answer as a percentage of total no of employee's

December 2006

- a. Science and engineering subjects    \_\_\_ (Number) OR    \_\_\_%
- b. Other subjects                                \_\_\_ (Number) OR    \_\_\_%

The final question is an open ended one.

**Q26. Could you briefly describe your most important innovation in the past three years?**

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**Q27. If I have any further questions or need further clarification will I be able to call you back on this number?**

- Yes
- No        Other number \_\_\_\_\_

**Notes:**

**That's the end of the survey, thank you very much for your time.**

Time finished \_\_\_\_\_: \_\_\_\_\_ 24 hour time

Date finished \_\_\_\_\_ / \_\_\_\_\_ / 2007

Interviewer Signed \_\_\_\_\_