The trade and investment sectors contained in the sector summary series have been compiled from Australian and New Zealand Standard Industry Classification (ANZSIC) classes using a value chain approach. This means that industry classes from ANZSIC have been grouped together to provide estimates of the size of the particular trade and investment sectors.

**Coverage:** The Tasmanian ICT sector operates across many sectors including manufacturing, research and services. Convergence due to the transformational effect of ICT, means the sector now includes other traditional sectors in part or whole, such as the emergence of global ICT dominance in news and media, advertising, creative industries and more. The Tasmanian ICT sector includes the traditional ICT ANZSIC codes, but an effort is made to include the ‘cross-cutting’ sectors where ICT is playing an increasing dominant role, reflected as a percentage of the sector. Refer to the last section of this sector summary for a more detailed breakdown.

### Key indicators

#### Industry value add

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Units</th>
<th>Period</th>
<th>Data</th>
<th>Change from five years ago</th>
<th>Per cent of Tasmania</th>
<th>Per cent of Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry value add (a)</td>
<td>$M</td>
<td>2012-13</td>
<td>$642</td>
<td>8.3%</td>
<td>2.9%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Employment (b)</td>
<td>No.</td>
<td>2011</td>
<td>4,568</td>
<td>9.5%</td>
<td>2.2%</td>
<td>3.5%</td>
</tr>
<tr>
<td>International exports (c)</td>
<td>$M</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Incomes (average weekly)</td>
<td>$</td>
<td>2011</td>
<td>$1,023</td>
<td>17.5%</td>
<td>115.9%</td>
<td>144.9%</td>
</tr>
<tr>
<td>Education (e)</td>
<td>No.</td>
<td>2011</td>
<td>2,667</td>
<td>NA</td>
<td>58.4%</td>
<td>75.5%</td>
</tr>
<tr>
<td>Employment (proportion full/part) (f)</td>
<td>Type</td>
<td>2011</td>
<td>Full-time</td>
<td>NA</td>
<td>78.5%</td>
<td>84.0%</td>
</tr>
</tbody>
</table>


(a) Source AEC Group. Industry value add (IVA) is a component of the ABS estimate of Gross State Product and measures the total value of goods and services produced by the sector less the value of inputs. Estimated change in IVA from five years ago for a sector is heavily influenced by change at the highest ‘ANZSIC Division I’ level of industry aggregation and is not reported.

(b) 2011 ABS Census. AEC group considers this the most accurate estimate of employment at the detailed four digit ANZSIC level.

(c) Estimates of international exports using ABS data.

(d) 2011 ABS Census. This includes employment and non-employment related income (for example, rents, dividends, interest, child support and government pensions and allowances). A percentage above 100 per cent of average weekly income suggests workers in this industry earn higher than the average wage.

(e) 2011 ABS Census. Education measured by the number of employees who have completed Year 12 (or equivalent studies). Per cent of Tasmania/Australia shows the proportion of workers in this sector who have attained this level of education.

(f) 2011 ABS Census. Per cent of Tasmania/Australia shows the proportion of workers employed in this manner.
Information and communications technology (ICT) is primarily related to activities involved with information, computing and communications, however it is a complicated sector to define, due to its transformational convergence effect on other sectors. ICT is a key economic enabler and its use is fundamental to participating in the global digital economy and effecting growth of all sectors.

The Tasmanian ICT sector has six main components of note:

1. ICT services, consulting and support.
2. ICT hardware, software and information-based products including design, prototyping, project management, production and distribution.
3. Telecommunications and digital infrastructure services and communications (including data centres).
4. ICT content and media services/product development (including creative and information digital media).
5. Broad cross-sectoral ICT solutions including emerging cloud-based platforms and services that take advantage of the National Broadband Network (NBN), delivering applications and services development as a means to provide productivity, efficiency and innovation solutions to business and society across all sectors, with emphasis on utilising advanced digital communications.
6. ICT research and education.

The broader definition of the Tasmanian ICT sector (including the cross-cutting sectors where ICT is playing an increasing dominant role) employs some 4,568 people and generates industry value add of at least $642 million.

There has been consistent revenue growth in the Tasmanian ICT services and application development subsectors over the decade. As a percentage of total Australian ICT revenue, the subsectors have grown from 0.8 per cent of the Australian ICT subsector total in 2003, to 1.6 per cent of the Australian ICT subsector total in 2010. Revenues through 2011-12 were expected to decline in response to weak economic conditions globally and in the state. The export value of the ICT sector is not currently defined, as the digital economy does not currently feature as a prominent market diagnostic or measurement entity outside the traditional economic models and processes. Therefore it is estimated that this number may be grossly understated.

Employment growth in the Tasmanian ICT workforce has not traditionally reflected the increasing growth in the employment of ICT professionals across all sectors. Measurable growth has been observed in the services and application development subsectors, which recorded employment growing from 500 in 2004 to 2,000 in 2010. The current overall ICT sector employment figure reflects the inclusion of a broader range of ANZSIC categories, demonstrating the expansion of ICT and convergence of other relevant sectors.

The service delivery and application development elements of Tasmania’s ICT sector are predominately made up of smaller operations, as regional support entities of multinationals or large global ICT service organisations. Private ICT service entities enjoying growth in the services sector are expected to be acquired by national and international operators within five years of operation. This results in a dilution of the measurable impact of companies in this space.
ICT growth areas

ICT is a fast-moving industry with a history and culture of disruptive innovation. The ICT sector itself has become a victim of the transformational effect of ICT on productivity, efficiency and innovation. These fast-track changes denote the demise of some traditional ICT markets and the inclusion of emerging and transformed digital markets, products and services. Noting the potential to be rapidly out-dated, these are the areas that are currently displaying signs of growth in Tasmania:

- **Software development** shows a high number of start-up companies and entrepreneurial ventures. Where enterprise and service-oriented application development used to be the predominant growth drivers, with demand from both corporate and social levels, the current take-up and growth of personal applications for smart devices is exceeding the traditional markets. The vendor capture of the channel market with online application stores, will impact on traditional application services development, revenue models and delivery.

- **Content and media services and development** maintains a steady and growing pool of expertise and contributes substantially to exports.

- **Local data centres and digital infrastructure** (including all aspects of storage, computing, middleware and value-added services hosted) must increasingly deliver on the availability of 'cloud computing services'. Tasmania’s investment in data centres is lagging national investment trends and may increasingly limit business credibility, efficiency and social acceptance. It is perceived that a lack of core backhaul infrastructure, to meet global rather than local demand, may be contributing to a lack of investment and demand in this space.

- **Cross-sectoral ICT innovation** products and services to drive productivity, efficiency and innovation. ICT innovation is growing and increasingly found in non-traditional ICT sectors. These products and services may or may not be produced in the ICT sector and may not be captured in traditional sector analysis.

- **Cloud infrastructure, applications and services**, are particularly needed to address complex cross-sectoral challenges and utilise social networking for niche applications and services. The demand for the development of next-generation, immersive, virtual environment applications is untested at present. Continued investment in fixed infrastructure (for example the NBN, related fibre infrastructure and medium to large-scale data centres) will be required to satisfy the exponentially-growing demand for digital services and cloud computing. Such investments continue to be a critical economic enabler for local economies.

- **Social and community digital transformation** through the proliferation and deployment of smart devices and the NBN. This area gives rise to increased opportunities to test and promote customer premise and community-based essential online services, such as eHealth, social services and education.

- **ICT research** has enjoyed Tasmanian and Australian Government funding in the past five years. This funding support should result in more opportunities for sector growth from research innovation. However, there are considerable barriers related to intellectual property (IP) protection and commercialisation models and these appear to be growing. Engagement in research by local ICT sector business continues to be problematic. ICT sector stakeholders maintain that the complexity, time restraints, differing agendas and cost of interacting with research entities makes access to and utilisation of IP from research both unproductive and risky, particularly in a constrained economic climate.

- **Government digital transformation** – migrating to a whole-of-government-oriented service model. Productivity and efficiency policies will continue to gather pace but Tasmania is currently lagging in this regard. Political and economic pressure is expected to both contract and expand ICT service delivery, as
it will become increasingly difficult for smaller players to provide the capital-intensive consolidated infrastructure and services required to achieve cost savings in the longer term.

- **National Broadband Network** – opportunities for ICT application development were perceived to grow, with overall business participation and community engagement in the digital economy. When the NBN begins to provide ubiquitous broadband access and next-generation technologies, applications and services should continue to emerge. A change in agenda with regard to the digital sector, digital infrastructure and the NBN will potentially delay developments and economic benefits to the state.

- **ICT-specialised research centres of excellence** are vehicles for international recognition of expertise in specific ICT research activities. For example, the informatics in CSIRO’s TasICT Centre, now called the Sensor and Sensor Networks Unit, and human-to-computer interfacing in the University of Tasmania’s HIT Lab. This includes Sense-T, a collaborative research project cofounded with foundation support provided by the University of Tasmania, CSIRO, the Tasmanian Government and the Commonwealth Government. All these institutions are examples of leading-edge research entities and knowledge centres working towards applying scientific research and ICT to real world problems.

## Constraints and opportunities

### Constraints

The local ICT sector’s response to a 2010 survey by the Centre for Innovative Industry Economic Research (CIIER) and Whitehorse, for the Sector Assessment reports covering 2008-09 to 2010-11, identified the following key barriers/constraints to success:

- Access to capital.
- Access to funds for research and development investment.
- Access to external markets.
- Availability of experienced enterprise architects.
- Commonwealth procurement policies.
- Skills shortages and lack of qualified staff.
- Lack of channel development capability.
- Inadequate sales and marketing skills.
- Limited digital infrastructure with cost constraints imposed by limited competition and a small market segment.

The constraints in this list have remained generally consistent over the past decade. The Tasmanian ICT industry identifies the following business issues:

### Business challenges

- Bargaining power of customers.
- Competitive rivalry and lack of cohesion within the industry.
- Threat of substitute products.
- Threat of new entrants.
- Bargaining power of suppliers.
Barriers to entry

- Strong competition in commodity services and non-niche products and services.
- Responsiveness of business operations to technology-driven changes.
- Business experience within start-up companies.

Specific characteristics of ICT companies

- Innovation driven by suppliers, resulting in continuing need to change products and services.
- Government dependency and sensitivity to policy change and budget cycles.
- Entrepreneurs in speculative software development transitioning to mature business processes.
- The majority of ICT businesses in Tasmania are small, and many of the generic small business issues apply.
- Access to skills:
  - loss of ICT qualification credibility and sustainability
  - inadequate specialised skills
  - vendor-captured skills development pathways
  - applicants lack skills/experience
  - lack of applicants, with wages/conditions seen as not competitive.

Opportunities

- Promoting and assisting ICT companies to pursue and establish global clients and revenue sources.
- Cloud based platforms, services and the NBN as a catalyst for the local development and test bedding of cloud applications, services and technologies.
- Application development and service support for small business, community and government to increase engagement in the digital economy.
- Application development for the increasing trend to mobile applications and broadband mobility.
- Leveraging and directing the local ICT research capability to provide a more open and accessible model of access to research intellectual property to promote derived commercialisation, innovation, intellectual capital and skills.

Outcomes from investments in ICT infrastructure and the delivery of ICT services impact on a whole-of-economy basis, as a result of productivity and efficiency gains.

The potential of ICT as a sector goes beyond the scope of the limited local-market demand. Economic growth opportunity exists in meeting global demand for ICT products and services, in either niche or mass market segments. More so than any other sectors, digital strategies to drive economic growth must be based on global digital opportunity and demand and not local consumption.

Strategies to support ICT in Tasmania are:

- Recognise the fluid scope and extent of the ICT sector. Actions for the ICT sector will not just focus on traditional small business models, but be inclusive of all business with emerging disruptive potential to grow into significant operations in global information, communications and technology.
• Promote the development of special interest groups in emerging clusters of ICT development and innovation.

• Actively promote investment in digital infrastructure especially increasing competitive, redundant and scalable access to global and national points of interconnect. Attract investment and invest in ICT infrastructure and services, to overcome the inherent limitations of operating within a small, island population. Develop infrastructure to international portals to increase digital export capability, instead of only attempting to meet local demand in strategy and policy considerations.

• Government to take the lead agenda and policy on promoting and developing digital productivity, efficiency and innovation as an economic enabler for the Tasmanian economy. Promote and support digital productivity and efficiency across all aspects of Tasmania’s economic, government and social agendas.

• Work outside of traditional capability or geographical economic strategy, and accept risk and ongoing disruptive change as an inherent part of the ICT sector’s development.

• Invest in exposing the state’s industry, business, government and society to futurist ideas and disruptive technology and thinking in order to stimulate the Tasmanian digital economy. Breaking down traditional thought and segmentation barriers will allow technology and innovation transfer across traditional boundaries.

• Ensure funded ICT research and development capability is accountable and responsible, with local outcomes proportional to funding received. R&D institutions should be primarily responsible for envisioning the potential of technology to achieve economic growth. R&D should be discouraged to commercially compete with industry.

• Attract digital innovation and business to Tasmania to increase and supplement the state’s ICT sector.

• Establish, investigate and develop support for a transition sector between heavily-funded research and commerce (industry), to take advantage of IP and technology and develop disruptive products and services.

• Promote, foster and support collaborative infrastructure related to convergence of sectors, to promote technology transfer, develop new markets and products and generate competitive scales of economy in Tasmania.