consunet®

2023 CAPABILITY STATEMENT

Electromagnetic Warfare

Spectrum Management

DevSecOps & Cyber

R&D Delivery Support

CONTENTS

20 YEARS IN THE MAKING

Our Mission

Our people create world-leading trusted cyber and spectrum security technology solutions, safeguarding our customers' interests. Consunet's goal is to become Australia's leading Information Warfare (IW) solutions developer. As a 100% locally owned and operated corporation, we deliver major IW projects as a trusted industry supplier to the Australian Defence and Intelligence communities.

A strong Research and Development (R&D) capability underpins our culture of innovation and excellence. We collaborate with our customers, research institutions and our peers to ensure we embrace only the best technologies. Our engineering teams create and support operationally relevant solutions that demonstrate a true capability edge. We lead with vision to deliver trusted and sustainable outcomes for discerning customers.

OUR VISION

Building the Australian cyber and spectrum security future

PRINCIPLES

Our Values

TRUSTED

Trust is earned, not bought, and is our principal value proposition. Trust permeates our organisation and underpins all our values.

SOVEREIGN

We create enduring knowledge and technology for Australia.

EXCELLENT

We strive for excellence as a habit.

LEADING

We lead with vision, innovation, and execution. In everything we do, we continuously challenge ideas, learn, and improve to exceed expectations.

SUSTAINABLE

We are sustainable through customer satisfaction, personnel satisfaction, business continuity, and environmental respect.

OUR STORY

Who We Are

As an Australian enterprise with over 100 talented staff creating solutions for the Australian Defence and Intelligence community, we have the capability and capacity to deliver trusted, world-leading solutions to address contemporary electromagnetic spectrum and cyber challenges.

Consunet is building the Australian cyber and spectrum security future. We focus on the design, development, deployment and support of high-assurance software solutions – trusted software and systems that do exactly what they are supposed to, when and where they are supposed to do it, and with the cyber and security safeguards needed to protect our customers' interests.

We collaboratively work with customers to understand and solve complex problems, and to develop world-leading software solutions that deliver enduring benefits.

Our customers often have unique requirements that benefit from support by our highly experienced research team to explore the art of the possible. In some cases, our customers have explored their own novel concepts before engaging with Consunet. In these situations, we convert our customers' concepts into robust, relevant solutions and support them into operation. Having over 20 years of experience across the entire capability lifecycle allows Consunet to tailor our responses for each customer, using the bedrock of technology and skills backed by robust systems and fearless innovative thinking.

Kuba Kabacinski
Executive Chairman

Don Gossink
Chief Scientist

Egon Kuster
Chief Technology Officer

Shane Reschke
Chief Engineer

Peter Freak
Chief of Operations

Amanda Major
Iteration & Visual Communications Lead

John Medlen
Program Manager

Tony Smart
Customer Engagement Lead

Richie Burton
Financial Controller

Dianna Caretti
HR Manager

DELIVERING FOR AUSTRALIA

Strategic Direction

Delivering sustainable, national interest outcomes is an enduring Consunet objective, shaping our intent, strategy and investment. The exponential rate of technology change provides exciting opportunities to create new value, whereas failure to keep up has compounding consequences. To ensure that future generations enjoy the benefits we have today, Consunet is building a sustainable advantage by focusing on unique capabilities that are critical to our customers' success.

Key to Consunet's mission is to lead the development of Australia's Information Warfare (IW) capability. In this broad domain, we focus on three core areas: Electromagnetic Warfare (EW), Electromagnetic Spectrum Management (SM), and DevSecOps & Cyber. Recent organisational growth and innovation investment enabled Consunet's past focus on EW capability to be complemented by world-leading SM capability. All technology innovation, delivery and sustainment is enabled through advanced DevSecOps & Cyber capabilities and process.

Consunet's core capabilities are highly relevant in Australia's current strategic context. The 2023 Defence Strategic Review identifies that "More attention and resources must be devoted to crucial future-focused joint capabilities such as ***information warfare, cyber capabilities, electronic warfare***, *and guided weapons and explosive ordnance.*"

Our intent is to create world leading, trusted, game-changing technology. To ensure alignment with present and future Defence requirements, Consunet EW and SM technologies enable rapid electromagnetic spectrum (EMS) manoeuvre, effects and automation. This assists in achieving spectrum dominance and other objectives set out in the Defence Electromagnetic Spectrum Strategy 2022. Our DevSecOps & Cyber capabilities facilitate trusted system delivery, leveraging industry-leading process, technology, trusted supply chains and state-of-the-art infrastructure.

Our immediate business focus is on the Australian Defence market and rapidly executing growth objectives at the scale needed by our customers. Our present business scale and maturity allows us to deliver all systems lifecycle stages across research, development, delivery and support.

Consunet's proven success in strategic EW capability creates a platform to pursue diversification into the civilian market in the short to medium term. Consunet's world-leading SM technology is intended to disrupt the future of wireless communications, autonomous systems and how we interact with tomorrow's world. When the current, significant export opportunities are realised, they will provide new capital to further accelerate technology innovation investment and business growth.

We recognise that business innovation is necessary to complement successful technology innovation. Consunet implements Agile management standards and best practice to ensure the enterprise scales without sacrificing agility. We believe that automation, data driven decision making and emerging Machine Learning and artificial intelligence technologies are essential drivers for enterprise efficiency, sustainability and competitiveness.

CAPABILITY

Electromagnetic Warfare

Consunet delivers cyber and spectrum security technology, specialising in high-assurance Information Warfare (IW) and Electronic Warfare (EW) systems, covering sensor/effector systems, signals exploitation capabilities, enterprise data fusion, information battlespace management, and complex, multi-system integration.

The Electromagnetic Spectrum (EMS) has become a critical resource for military operations but it has also given rise to new challenges. Increasingly congested and contested EMS requires geospatial monitoring, management and the ability to enable allied agility and enemy denial of the EMS. Worldwide, technologies that exploit, protect, deny and degrade the usage of the EMS are evolving at a rapid pace, alongside increasing demand.

With both civilian and military usage of the EMS continuing to rise, Consunet has developed a deep understanding of the EMS domain. We build, deploy and support robust, high-assurance EMS solutions that deliver allied EMS agility, more efficient use of the EMS, EMS management, and EMS exploitation, including cooperative precision geolocation capabilities.

Consunet is the prime contractor delivering Australia's next-generation Electromagnetic Battle Management (EMBM) solution, providing Australia's Defence Force with the knowledge and tools necessary to make appropriate decisions about EMS use and prioritisation. As a truly Australian-owned prime, Consunet is delivering the EMBM capability using an open, scalable and software-agnostic architecture that ensures a flexible national security capability developed and supported entirely in-country – one that can evolve as new challenges and opportunities emerge.

Our team of systems, software and hardware engineers, data scientists, project management and ex-military specialist personnel deliver and support high-assurance EMS solutions covering EW situational awareness, signals exploitation, novel software defined radios, sensor and effector systems, EW command and control (C2), and IW data management capabilities through the full Defence capability lifecycle.

Our doctoral-level research team specialises in applying Artificial Intelligence (AI) and Machine Learning (ML) solutions to emerging EMS challenges.

Consunet's engineering capabilities leverage international standards, Agile methodology best practice, industry leading tools and state-of-the-art, Defence accredited and certified secure facilities to create a high-assurance, sovereign EW Capability Factory.

Spectrum Management

Consunet has responded to the increasing demand for efficient management of Electromagnetic Spectrum, becoming a global expert in using Machine Learning (ML) and Artificial Intelligence (AI) to develop innovative spectrum solutions that are currently deployed in commercial and military settings.

Collectively known as DUST, our 'Distributed aUtonomous Spectrum managemenT' techniques have been developed for dynamic situations where efficient spectrum access is critical to operations, from busy cities to war zones. The technology continuously creates and evolves the customer's spectrum plans and dynamically coordinates spectrum access across many users and devices, from radar and sensors to communication systems and satellites.

The DUST solutions encompass:

- Spectrum Simulation which enables testing of specific environments before deployment
- Synthetic data modelling for ML and AI based planning
- State-of-the-art Spectrum Forecasting, analogous to weather forecasting, to predict and act in real-time to changing spatiotemporal constraints
- Optimised Spectrum Management to counter imbalances in spectrum availability
- Trusted Spectrum Sharing for dynamic collaboration, with the ability to identify non-cooperative actors and render them ineffective

Spectrum Simulator

The Consunet Spectrum Simulator, known as Ark, simulates electromagnetic spectrum usage for a "city-scale" number of users.

Here's how it works:

- Simulation models power spectrum; detailed physics models are abstracted to suit the requirement
- Communication systems, such as Wi-Fi, have models within the simulation that generate events of spectrum usage
- Agents are used to represent people and their devices, as well as autonomous systems, for example to simulate work/home patterns or other patterns of movement across time and space
- Environmental effects on spectrum efficiency are integrated using realistic propagation loss models

DUST video

Spectrum Management/Artificial Intelligence
Consunet applies innovative AI Planning and Scheduling techniques to the problem domain of Spectrum Management to create opportunities for spectrum efficiency. The clever exploitation of Spectrum Forecasting makes use of previously unused spectrum, minimises spectrum damage, and coordinates access/usage across large groups of users. Consunet's ML algorithms are ingested for the AI to continuously generate viable spectrum plans, eliminating human error as the spectrum environment becomes more and more complex. Combining this planning ability with anomaly detection enables a highly adaptive, continuous, near real-time Spectrum Management capability.

Spectrum Forecasting/Machine Learning
Spectrum Forecasting, aka 'spectrum weather', is the application of ML models using past spectrum utilisation data. Like a weather forecast that might change over time and geography, Spectrum Forecasting addresses three distinct challenges:

1. Temporal forecasting of spectrum occupancy for individual receivers at specific locations influenced by historical spectrum data from the same location
2. Spatial interpolation of spectrum occupancy at arbitrary points in space and time
3. Spatiotemporal forecasting performing simultaneous temporal and spatial predictions

The ML model for Spectrum Forecasting can also be extended to perform anomaly detection to identify unusual activity.

Data Generation & Manipulation
Data manipulation encompasses the transformation of data essential for training ML and AI models. Synthetic data enables the DUST team to create validation sets for AI based planning and generate insights and improvements to algorithms. In addition to ML and AI training, the data itself has utility as a product to create realistic background spectrum for third party simulation and emulation systems.

Spectrum Sharing
The DUST technology's trusted negotiation techniques unlock further dynamic adaptability and spectrum efficiency by reassigning newly available 'sensed' spectrum and underutilised planned reservations to those that need it. This technology can enable collaborative 'coalition' Spectrum Sharing.

By addressing Spectrum Management problems with the technology of today, DUST users gain resilient dynamic spectral planning and manoeuvre capability essential for the conduct of operations in both Defence and commercial applications.

Unexpected and non-cooperative actors can be detected and either outmanoeuvred or rendered ineffective via the cooperative processes provided by DUST for Defence applications. Commercially, users will gain greater access to the spectrum for the benefit of their suppliers and users.

DevSecOps & Cyber

Consunet's DevSecOps services provide a best practice methodology for secure software delivery underpinned by Agile methodologies and management practice, combining development, security and operations into a continuous delivery approach.

To provide high assurance and trust, the **Consunet DevSecOps Capability Factory** considers all elements that make your project an operational success, built on the foundation of Continuous Integration/ Continuous Development (CI/CD) for Agile teams.

Product CI/CD Pipelines offer strategic, multi-stage security controls with shared secure and trusted code and artifact repositories.

DevSecOps Services simplify and accelerate development for effective collaboration and proactive security monitoring.

Secure Infrastructure increases trust in your products and services, freeing delivery teams to focus on your customer and user needs.

Embedded Collaboration for multi-vendor and supplier environments fosters cohesion and delivers interoperable, flexible, trusted outcomes that consider ownership using IP Frameworks and shared Code/Artifact repositories.

Trusted Governance supports ongoing accreditation and authentication of environments and products and the assurance that security processes are applied consistently.

Open-Source software and hardware interoperability standards and open architectures provide transparent, secure, trusted and flexible solutions, to support robust and emerging capabilities.

Consunet's services support your journey to achieving trusted, secure development practices. We offer turn-key engineering and DevSecOps environments to support new and migrated projects, or uplift your existing environments to best achieve your desired outcomes.

Maturity assessments help you plan pragmatic strategic activities, while Consunet's advisory service provides a jump-start by identifying potential risks or roadblocks to your secure development capability.

Consunet can design, build and maintain Managed Trusted DevSecOps Environments that are in the cloud, on-premise, hybrid or within classified enclaves. Consunet can deliver capability alongside existing teams or as a standalone service following Agile/systems engineering practices. These offerings support your strategic planning, risk mitigation, cost reduction, skill limitations and capacity needs to achieve a high-assurance, secure and trusted development environment that customers and users demand in an increasingly volatile cyber threat environment.

Use of additional pre-flight actions, pre-scans, intermediary scans and monitoring solutions allow Consunet's customers to identify and address concerns around supply chain attacks, hidden malicious code and libraries, code vulnerabilities and other risks that can affect the viability and trustworthiness of your products and services. Consunet's holistic approach increases your cyber fitness against attacks and provides proactive monitoring to identify and address risks in a planned and controlled manner.

Consunet uses proven, robust solutions that have matured through the Cloud Native Computing Foundation (CNCF) and other US Government DevSecOps environments, such as PlatformOne and their Customer DevSecOps Platform (DSOP), with elements such as the Iron Bank – DoD Centralised Artifacts Repository (DCAR) or the UK Defence DevSecOps Service (D2S).

Research and Development

Our R&D team has deep knowledge in computer science and engineering aimed at creating novel, practical approaches to solving difficult Electromagnetic Spectrum problems. The team specialises in applying Artificial intelligence (AI), Machine Learning (ML), computational theory, and distributed computing to derive real world solutions. Consunet invests heavily into its own R&D programs and is leading the Distributed aUtonomous Spectrum managemenT (DUST) project, in collaboration with several Australian Universities and the Defence Science and Technology Group (DSTG), with funding support from the Trusted Autonomous Systems Defence Cooperative Research Centre (TAS DCRC).

DUST delivers distributed, near real-time, dynamic autonomous Spectrum Management and automated planning. Its aim is to deliver orders of magnitude increase in agility and efficiency cost savings for Australian Defence and commerce.

Consunet is a registered Research Service Provider (RSP)* with a doctoral and masters level research team. RSPs are specialist organisations registered with the Australian Department of Industry, Science & Resources to undertake R&D on behalf of, or under contract to, other organisations. Australian companies that engage RSPs can claim all eligible research and development expenses, subject to certain criteria, through the R&D Tax Incentive scheme.

**RSP number 123043*

The Electromagnetic Spectrum is a finite resource critical to enabling wireless communications, radar and sensors. It is often described as complex, contested, and congested. In a Defence context, it is critical to Command and Control (C2); Intelligence, Surveillance and Reconnaissance Electromagnetic Warfare (ISREW); Space; and Cyber Security. Recent conflicts have highlighted how spectrum represents an increasingly important battle dimension for Defence.

Globally, the allocation of spectrum is an outdated and expensive process. Highly congested areas of the spectrum coexist with spectrum ranges that are grossly underutilised. Spectrum Management is further complicated when non-cooperative participants vie for control of the same spectrum resource. DUST is a disruptive technology that will solve many present-day Spectrum Management shortcomings in both Defence and commercial domains.

This Consunet-developed technology has applications in terrestrial and satellite communications as well as delivering advantages for Defence by leveraging real-time and predictive understanding of the spectrum.

As a direct result of successful R&D, our engineers are transitioning DUST technologies into operational service across multiple applications.

Consunet welcomes discussions around further commercialisation partnership opportunities with large spectrum users and allied organisations.

SINCE 1999

Our Journey

After humble beginnings in 1999 and a decade of building domain expertise with a small but credible team of specialist engineers, Consunet won its first million-dollar contract in 2010 to transition a logistics software prototype into a production capability. We started delivering Electronic Warfare capabilities for fast jets in 2015. At this point, Consunet was still only 9 people. In 2016 we followed the change in Commonwealth R&D policy and invested in technology innovation to fuel growth.

In 2018, Consunet won the Trusted Autonomous Systems Defence Cooperative Research Centre (TAS DCRC) project to create Distributed aUtonomous Spectrum managemenT (DUST) technology. This multi-year project gave Consunet the confidence to continue investment, and Consunet's growth story took flight. Staff numbers grew from 26 in 2018 to around 100 in 2022.

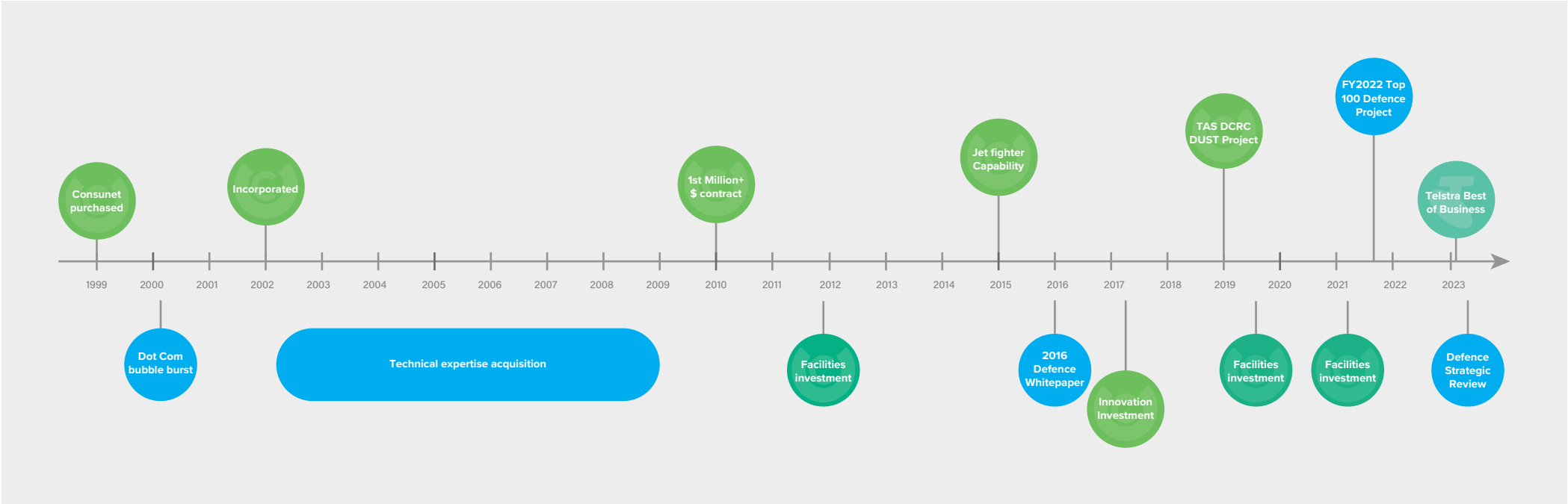
Consunet subsequently won the project to build Australia's Electromagnetic Battle Management solution, which was one of Australia's top 100 Defence procurements for the 2022 financial year. The company invested heavily to play and win against six multinational primes, and the event marks the point where Consunet was no longer a small business. Consunet is now actively delivering outcomes of national importance.

This is our foundation for building an Australian Defence prime capable of global relevance.

Our focus now is on growing sustainably but keeping our sights on our most ambitious technology goal, which is to disrupt how the radio frequency spectrum is managed. Spectrum Management is a 100-year-old process devised when radio communication was invented. Spectrum is a finite resource that is an essential enabler of modern technologies, but it is fraught with historic issues around spectrum allocation in a world that needs real-time availability and cost efficiency. Consunet is seeking to disrupt this process with innovation investment in game-changing technology to make spectrum rapidly available while protecting existing spectrum asset value.

Consunet is already demonstrating the viability of our approach by delivering aspects of our DUST technology to Australian Defence, supporting the national interest. Commercial applications using the technology will soon emerge both locally and internationally.

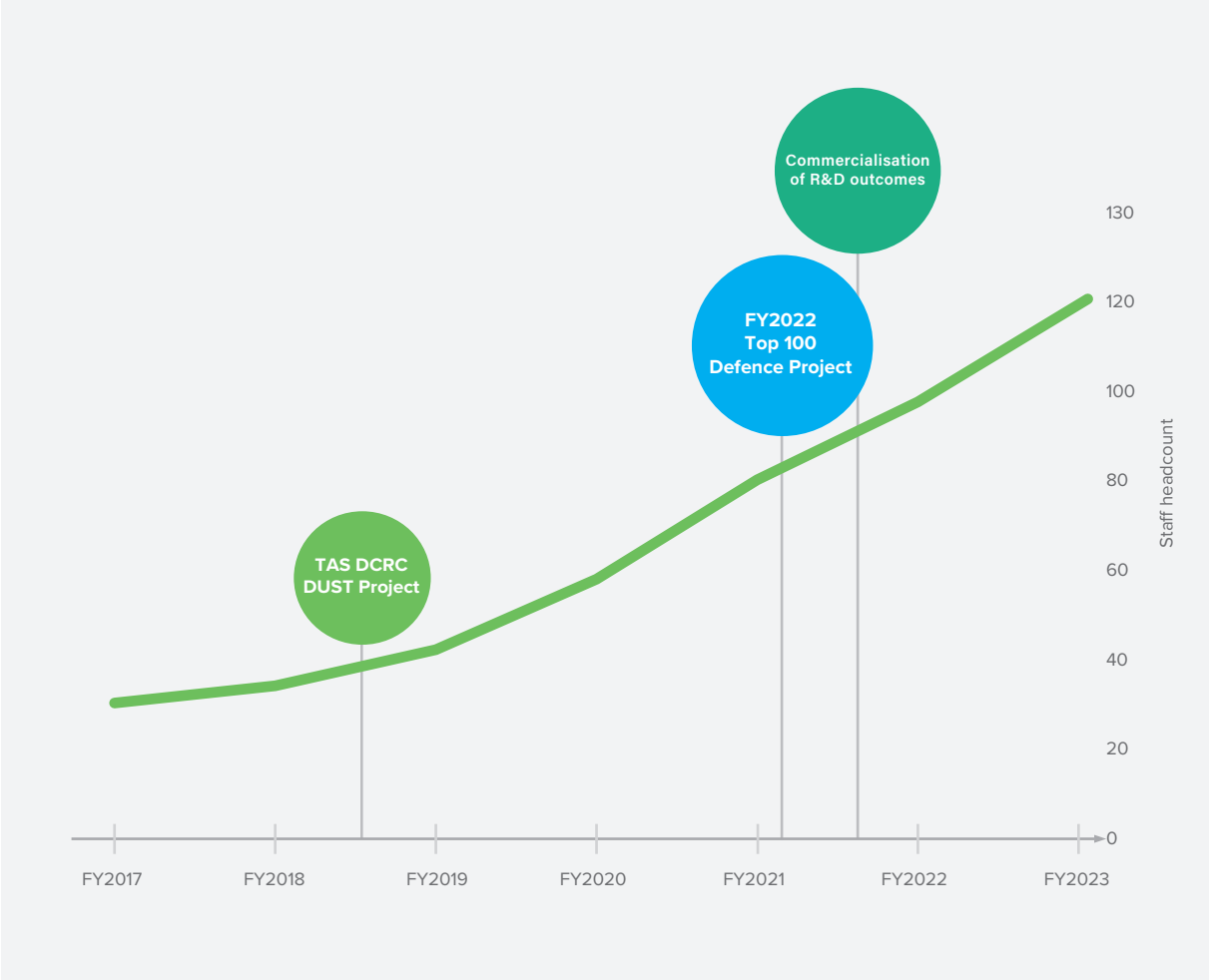
With opportunity abounding, we are focused on becoming an employer of choice, with the prospect of changing the future of wireless communications, autonomous systems and how we interact with tomorrow's world.



OUR JOURNEY

Growth

Consunet has invested in people, ICT infrastructure, and accredited secure facilities that support sustained projected growth. The graph below illustrates our considerable organic expansion over the past six years, fueled by successful growth projects including the Trusted Autonomous Systems Defence Cooperative Research Centre (TAS DCRC) project to create Distributed aUtonomous Spectrum managemenT (DUST) technology, and the $61 million Electromagnetic Battle Management project. Our R&D investment and mature engineering capabilities are now meaningfully delivering advanced capabilities for Australia's air, land, naval and space defences.



44 Waymouth Street,
Adelaide, South Australia 5000

GPO Box 449
Adelaide, South Australia 5000

+61 (0) 8 8234 8819

contact@consunet.com.au
www.consunet.com.au