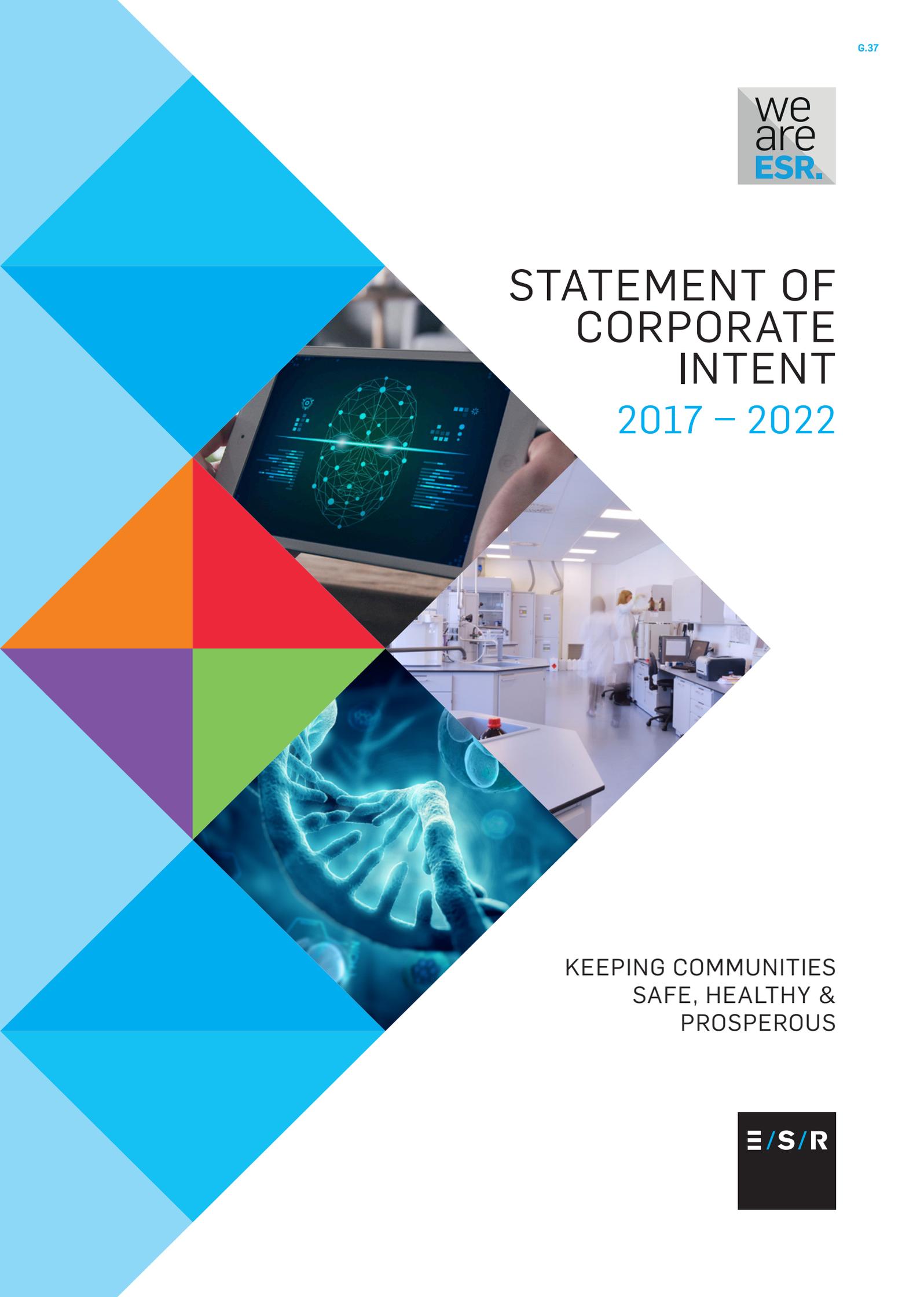


we
are
ESR.

STATEMENT OF CORPORATE INTENT 2017 – 2022

KEEPING COMMUNITIES
SAFE, HEALTHY &
PROSPEROUS

ES/R



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Presented to the House of Representatives pursuant to section 44 of the Public Finance Act 1989.
The Institute of Environmental Science and Research Limited (ESR) is a Crown research institute.
It was incorporated in June 1992 and is wholly owned by the New Zealand Government. The two shareholding Ministers appoint a Board of Directors to govern the organisation. ESR has science facilities in Auckland, Wellington (Porirua and Wallaceville) and Christchurch.

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EXECUTIVE SUMMARY

We are pleased to present ESR's 2017–2022 Statement of Corporate Intent (SCI). The SCI outlines ESR's operating environment, strategy and the activities we will undertake to 'keep communities safe, healthy and prosperous through smart and sustainable science'.

Over the next five years our innovative science will have positive impacts on the lives of New Zealanders.

ESR's expertise and insights will help reduce the spread of infectious disease and ensure New Zealand's pandemic response capability can deal with new emerging threats. We will use the latest developments in genomics and bioinformatics to create a healthier population. Together with the vast amount of genetic data available from DNA sequencing, ESR scientists and clinicians will have more powerful tools to study antibiotic resistance superbugs and identify effective countermeasures.

To advance the Business Growth Agenda and help meet New Zealand's export growth targets, ESR will develop enhanced technologies to eliminate infectious diseases from food and identify the source and composition of food products.

ESR's research will enhance water quality by reducing waterborne diseases in drinking water, rivers and streams and the tracking of nitrate levels in groundwater. ESR will continue to lead the Centre for Integrated Biowaste Research to develop new treatment options that reduce the amount of biowaste disposed in landfill and the ocean.

We are developing new techniques to prevent and solve crime, using forensic intelligence to better understand and predict patterns of behaviour and crime. Our work will directly contribute to government's Better Public Services goals to reduce total crime - violent crime, youth crime, reoffending and assaults on children.

Our experts will continue to work across a wide range of sectors to provide advice, services and research capability on public, occupational and medical exposure to radiation, performance assessment of radiation protection equipment, and the measurement of naturally occurring radiation.

To improve outcomes for Māori we will undertake more science aligned with Vision Mātauranga and develop stronger relationships with iwi.

Our research will help New Zealand achieve several National Science Challenges relating to Healthier Lives, Our Land and Water, New Zealand's Biological Heritage and the Deep South.

Our refreshed strategy *ESR into the future* will enhance our long term performance in three ways – by fostering our core science, expanding the business and investing in our resources:

- To foster our core science we will adopt the latest international developments in science and technology. ESR's investment in a MiSeq genome sequencing machine for example allows our scientists to process and analyse significant amounts of data in a short time. Our services

will increasingly leverage big data to provide our clients with deeper insights to inform their decision making. ESR's operating model will be reviewed to better deliver our innovative science services.

- We will grow the business by focussing on international markets for our products and services. We will continue to invest in our world leading forensic software STRmix™ and increase our presence in new and existing markets. A formalised approach to marketing will improve public awareness of ESR and how we are helping people and communities. Innovative new research ideas will be encouraged through a sustained increased allocation to our Pioneer Fund.
- To ensure we have the appropriate resources necessary to deliver our science we will invest in the latest science and technology. We will develop a property strategy to ensure our science facilities are aligned with our operating model. Investing in our people is critical to success so we will increase our science capabilities and strengthen leadership potential to create a workplace culture which encourages innovation.

Over the next five years we will continue to improve our financial performance. To achieve our target of 8% return on equity we will arrange our contracts with core government clients on a more sustainable basis. We are also planning to increase revenue from commercialised products, new partnerships and new international clients. In 2021/22 a one-off reduction in profit is expected due to the \$5m write-off of the Kenepuru Science Centre which will be replaced with modern facilities. Profits over the next five years will be retained by ESR, allowing us to address ageing science facilities, invest in IT systems and increase investment in research in areas that make a difference to New Zealanders.



Denise Church QSO
Chair



Dr Keith McLea
Chief Executive

ESR'S PURPOSE

ESR is a unique Crown Research Institute (CRI) in that we specialise in science that improves the lives of people and communities.

ESR's mission is 'keeping communities safe, healthy and prosperous through smart and sustainable science'.

Our independent scientific advice and services safeguard people's health, provide the justice sector with expert forensic science, protect our food based economy and improve the safety of our fresh and groundwater resources.

Our high calibre teams provide independent, authoritative and trusted science solutions. We are known for

our advanced science capabilities in microbiology, DNA and our ability to solve complex problems. Our sciences include health, forensic, food and water, radiation, social systems and workplace drug testing.

Statement of Core Purpose

ESR's purpose is to deliver enhanced scientific and research services to the public health, food safety, security and justice systems, and the environmental sector to improve the safety of, and contribute to the economic, environmental and social well-being of people and communities in New Zealand.

Outcomes

ESR provides research and scientific services and knowledge transfer in partnership with key stakeholders including government, industry and Māori to:

Safeguard the health of New Zealanders through improvements in the management of biosecurity and threats to public health

Increase the effectiveness of forensic science services applied to safety, security and justice investigations and processes

Enhance protection of New Zealand's food based economy through the management of food safety risks associated with traded goods

Improve the safety of freshwater and groundwater resources for human use and the safer use of biowastes

OPERATING ENVIRONMENT

To respond to the opportunities and challenges in the years ahead ESR will need to continuously scan the horizon and remain agile.

Challenges faced by New Zealand

ESR's science will adapt to address several important challenges faced by New Zealand. These include violent crime, drug related offending, repeat offending, the threat of pandemics, antimicrobial resistance, foodborne disease outbreaks, risks to New Zealand's reputation as a quality food producer, waterborne diseases in waterways and nitrate levels in groundwater. The Business Growth Agenda and Better Public Services will remain high priorities for ESR.

Science trends

ESR keeps up to date with the latest advances in science through our external Strategic Science Advisory Panel and our scientists who closely monitor international developments. Advances in genomics and bioinformatics are especially important to keep abreast of as they provide such rich genetic information to help researchers uncover the causes of diseases and provide better information on local variants. Some countries have already begun to link their health data to genetic data. The cost per genome is expected to continue to decrease but the demand for storage and computing power will increase significantly. Miniaturised and more portable DNA equipment is being developed which will change the way samples are collected and analysed.

Client expectations

Our major government clients are likely to continue to face ongoing challenges in improving outcomes while operating under fiscal constraints. We maintain strong client relationships at both the operational and strategic level which helps us develop a deeper understanding of the outcomes and impacts that our clients and their stakeholders plan to achieve. This informs our longer term

collaborative planning, service delivery and future product development. The newly formed Evidenced Based Policing Centre with New Zealand Police and the University of Waikato is a good model for working more closely with clients to better meet their needs. We will continue to investigate new and innovative ways of configuring products and services to suit our clients.

New Zealand's science system

New Zealand has a small and relatively fragmented science system, requiring effective collaboration between key players to get the best results for New Zealand. We will continue to actively partner with CRIs, District Health Boards, Universities, Regional Councils, Government Agencies and International Agencies such as CDC to solve problems. Our Social Systems scientists will continue to investigate and analyse complex social issues with partners to find solutions to issues that face our society, such as family violence.

International growth

ESR will continue to explore opportunities to increase our presence in overseas markets. We are already working in the United States, Europe, the Middle East, Asia, Australia and the Pacific. We aim to become the key provider of scientific advice for Pacific Island nations where we currently work to provide safe drinking water and improved wastewater management, hygiene and sanitation.

Commercial expertise

We are embedding our commercial capability in order to successfully expand our commercial products and expert advisory services to new clients as well as focussing on taking new products to market. As we build our commercial expertise we will continue to work with trusted partners such as KiwiNet and The Icehouse to benefit from additional commercial expertise to create value from our intellectual property.



STRATEGY

*Our refreshed strategy **ESR into the future** is a plan to invest in high value science to deliver better outcomes for New Zealand and improve our financial sustainability.*



Building on the improved financial results and stakeholder satisfaction achieved over the last two years, ESR has been reviewing its long term strategy to maintain the momentum and continue to keep New Zealanders safe, healthy and prosperous.

Key strategies include delivering better value for New Zealand through strategic partnerships, providing clients with better data, evidence and analysis to support their decisions, using the latest developments in genomics and bioinformatics, increasing international

growth of our innovative products and services, developing ESR's next operating model and developing the property strategy.

The table below shows the initiatives which will be implemented in 2017/18 to develop ESR's core science, expand the business and invest in our resources.

Strategic themes	2017/18 Strategic initiatives	By 2022
Develop our core science	<ul style="list-style-type: none"> Genomics and informatics Evidence Based Policing Data to wisdom One Health Vision Mātauranga Enhanced partnership agreements with NZ Police and Ministry of Health (MoH) Review ESR's operating model 	<ul style="list-style-type: none"> Higher value science provided to our clients and New Zealand: <ul style="list-style-type: none"> reduced spread of infectious disease New Zealand's pandemic response capability enhanced to manage new emerging threats new forensic techniques used to prevent and solve crime new technologies developed to eliminate disease from food new technologies developed to improve water quality and new treatment options developed for biowaste Deeper strategic partnerships with key government agencies ESR's next operating model in place
Expand the business	<ul style="list-style-type: none"> International growth Grow STRmix™ Marketing for sustainable growth Launch new products and services Grow research revenue 	<ul style="list-style-type: none"> Increased presence in international markets Increased profitability to reinvest in the right people, science and technology
Invest in our resources	<ul style="list-style-type: none"> Mobile worker strategy Online lab processes Cost efficiency programme Financial systems review Property strategy 	<ul style="list-style-type: none"> Smart technology that enables our staff to work from anywhere Advanced systems in our laboratories Improved business processes Modern science facilities with flexible workspaces

DEVELOPING OUR CORE SCIENCE

Delivering higher value science, ensuring our capabilities incorporate the latest developments in science and technology and reviewing our operating model.

Genomics and bioinformatics

Genomic technology will be integrated into service delivery for all operational business groups, fundamentally altering the way we deliver our service to clients. It will also provide a platform for consolidation and concentration of common elements across ESR. This will enable ESR to provide the analytical capability necessary to interpret genomic data.

In particular ESR will contribute to the implementation and management of genomics in the New Zealand healthcare sector, in close conjunction and collaboration with key sector stakeholders and the Ministry of Health. There is an exciting opportunity for health professionals and researchers to proactively develop and implement genomic capabilities to support healthcare. We can leverage exceptional research efforts and policy thinking already underway within New Zealand and learn from international advances in human genomics to improve patient outcomes and reduce healthcare costs. New Zealand may not have the scale to adopt a world leading position in genomics research but it does have an opportunity to be a fast follower of international scientific advances, proactively and consistently implementing the technology nationally.

Evidence Based Policing

ESR is a strategic partner in the recently announced Evidence Based Policing Centre. The Centre will assess the best research and evidence on the prevention and reduction in crime to inform interventions by New Zealand Police. ESR will undertake research projects focused on crime prevention in line with the Investment Approach to Justice. ESR's participation in Evidence Based Policing will provide the opportunity to develop deeper strategic relationships with Police.

Data to wisdom

Increasingly our clients are looking to ESR to interpret data and evidence, explain the implications, identify insights and inform the range of actions they might take. ESR has the skills and data networks to extend human data analysis

and convergence capabilities more widely across the health, social welfare, justice, environment and education sectors. A human data hub will be developed including a next generation data warehouse, business intelligence and analytics capability. The hub will facilitate the collection and analysis of national human data in conjunction with other leaders in this area e.g. Social Investment Unit, Integrated Data Infrastructure and Statistics NZ. ESR will extend its public health surveillance capability and New Zealand will benefit from advanced warning of public health related situations and be able to put counter-measures in place sooner.

One Health

The 'One Health' approach recognises that the health of people is connected to the health of animals and the environment. Six out of every ten infectious diseases in humans are spread from animals. The goal of One Health is to encourage collaboration across multiple disciplines to improve the health of people, animals, and our environment. ESR will develop research projects aligned to One Health and generate new revenue from research funding and professional services.

Vision Mātauranga

ESR will engage with Māori to understand their challenges of primary concern. ESR will develop strong relationships with iwi and undertake more science aligned with Vision Mātauranga. We will use existing science based solutions and technologies, and examine the development of new technologies, information and research to add value to Māori assets. Opportunities to partner and collaborate on work in key areas of interest to Māori will be identified. Māori engagement will be coordinated across ESR and meaningful relationships will be developed with Māori clients.

Relationships with New Zealand Police and Ministry of Health

ESR will continue evolving services to provide greater value to contribute to Police's strategic goals. ESR will continue to develop relationships with the Ministry, embracing a partnership that fully utilises ESR's skills.

Operating model

ESR is reviewing the way it operates to ensure it is configured for future success. The development of ESR's genomics capabilities will be a key driver of this, as it will change the mix and quantum of traditional laboratories and office based analytics. ESR's next operating

model will reflect increasingly shared capabilities, resources, equipment and facilities across business groups. ESR's next operating model will be based on the following principles:

Planning for the future →

<p>CONVERGENCE ESR will adapt and adopt technology and science services to drive its next operating model</p>	<p>COLLABORATION ESR's capability will increasingly focus on clients, not a division or scientist. ESR will increase participation with external parties to drive research and service outcomes</p>	<p>CONSOLIDATION ESR's operational footprint will optimise overheads, to support collaboration internally, and leverage assets common to all science domains.</p>
<p>RESILIENCE ESR will maintain capabilities to support key clients through resilient operating models and partnerships on and off shore, ensuring ESR's essential scientific services are always available in a crisis.</p>	<p>CAPABILITY BUILDING ESR's desire is to build high-value skill sets around collecting, maintaining, manipulating, processing and presenting human data – this will ensure that ESR is a highly attractive service provider or partner to current and future clients.</p>	<p>RESEARCH Research will grow as a competence reinforcing ESR's reputation. It will also be a key source of growth and remains the underpinning form of the organisation as a CRI.</p>
<p>VIRTUALITY Location is not a prerequisite of participation. Teams will be bound by objectives, relationships and culture. ESR will become a network-centric organisation.</p>	<p>FLEXIBILITY ESR will utilise its key scientific and other resources more dynamically and refocus them to meet opportunities.</p>	<p>AGILITY ESR will become more responsive to clients and market opportunities. This will be evident in the way we work, adopt, adapt and cope with changes and opportunities.</p>
<p>SOLUTION FOCUSED ESR will promote and develop science into service opportunities that are ongoing.</p>	<p>CLIENT FOCUSED Science will be fit for purpose science and valued by the market. ESR will understand better how the market wants to use its services.</p>	<p>COMMERCIALLY FOCUSED ESR will recognise opportunities to develop, market and sell its intellectual property.</p>

EXPAND THE BUSINESS

Growing revenue in New Zealand and overseas, and growing the pipeline of new ideas.

International growth

Coordinated international engagement will provide increased access to international activities to establish an internationally recognised brand. Selected markets including the United States, Middle East and Asia-Pacific will be targeted. We will continue to implement our Healthy Pacific Environments strategy. We will increasingly profile the services we provide to health companies, international engineering consultancies, and international governments.

STRmix™

Results from the commercialisation of our world-leading DNA forensic software STRmix™ have been very promising and we expect sales to increase further. ESR will implement a revised STRmix™ business plan, recognising the need to put in place the structure required to accelerate growth and further develop the product.

In May this year ESR introduced FaSTR™ an expert forensic software that rapidly analyses DNA profiles, ensuring consistency and efficiency in DNA analysis. The software has been developed by ESR, with Forensic Science South Australia (FSSA), and can be optionally coupled with STRmix™ for seamless interpretation of mixed forensic DNA profiles. FaSTR™ enables forensic laboratories to automate the analysis of DNA profiles generated by genetic analysers and standard profile testing kits, expediting this otherwise time-consuming process and ensuring consistency in DNA analysis, which is critical to meeting quality assurance criteria.

Marketing for sustainable growth

Formal systems and processes will be embedded across ESR to ensure a consistent, coordinated and client-focused approach to marketing, promotions and sales.

New products and services

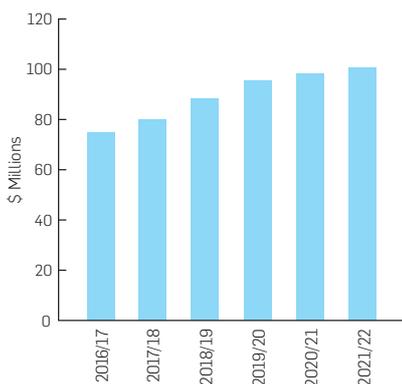
For all commercialisation projects we will follow a stage-gate process and look to supplement our own funds with co-funding. The pipeline of new innovative ideas will be encouraged through an increased allocation to our Pioneer Fund.

We will also seek to take advantage of partnership opportunities relevant to our strategic direction. In some of the sectors we work in (such as the food sector) there are multiple, complementary sources of expertise. This means that the best value for NZ Inc will be delivered to clients through multilateral partnerships with other CRIs, universities, local authorities, health authorities and others. We will build collaborative partnerships to deliver better and apply commercial assessments to all new work.

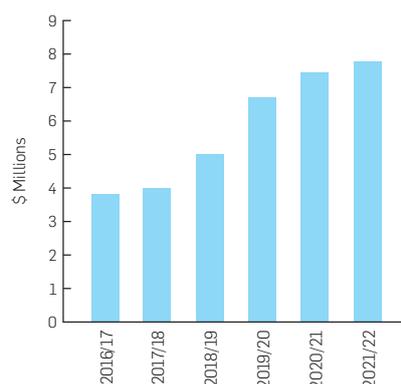
Grow research revenue

Smart research underpins the services we deliver and enhances our reputation as a high quality research organisation. Building on recent successes in attracting research funding we will develop targeted bids focused on science excellence and impact. In addition to bidding for MBIE, Health Research Council and Marsden grants we plan to collaborate on international research projects.

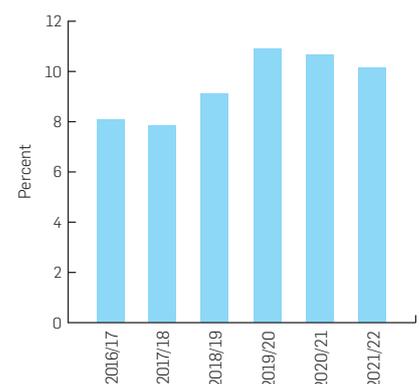
REVENUE



NET PROFIT AFTER TAX*



RETURN ON EQUITY*



*excludes the write-down of the existing Kenepuru Science Centre in 2021/22

INVESTING IN OUR RESOURCES

Using the profits we generate to invest in people, equipment, facilities and information technology for the future.

Information technology

Technology is the critical enabler of the next operating model and is key to workforce mobility. The Mobile Worker initiative will establish policies, technology, infrastructure and online services to seamlessly, securely and safely work from any device anywhere. We will also move our manual and segmented business processes to a digital platform supporting workflow, approvals, automation of tasks and client interactions. We will develop a modern and robust core platform capable of supporting systems of national significance, improve access to vast amounts of data and adopt high performing technology platforms.

Cost efficiency

Stronger investment processes will be introduced to examine all investments, including capital expenditure and the strategic allocation of Strategic Science Investment Fund (SSIF) research funding. At the same time we will focus on streamlining our cost structure.

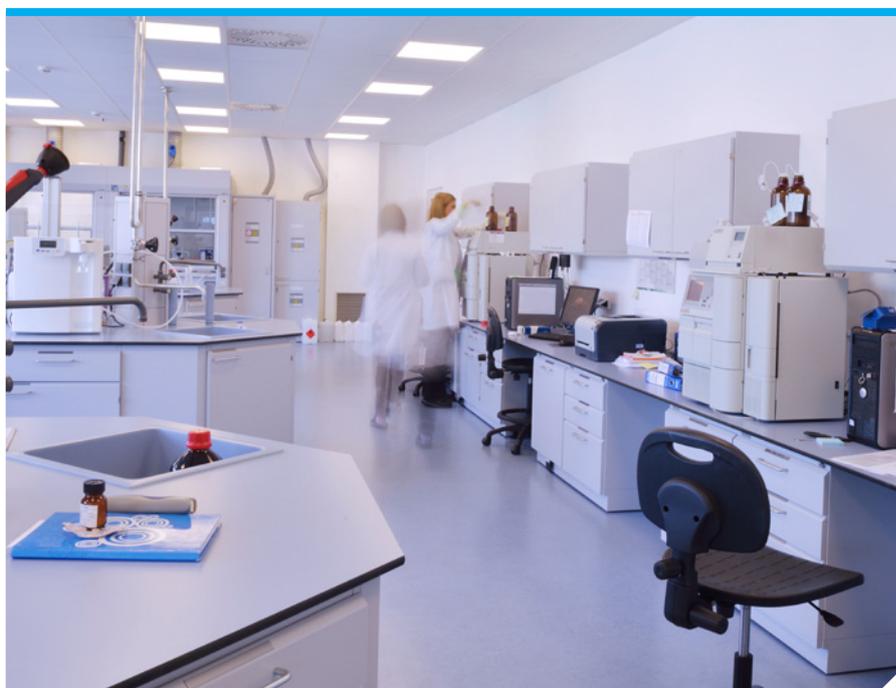
Property Strategy

We continue to focus on maximising the efficiency and utility of our science facilities in Auckland, Wellington and Christchurch. ESR's property strategy will take account of the future

operating model, proximity to major clients, access to skilled staff, ability to support growth into international markets, the potential for using hubs and co-locating with other science organisations, business continuity and financial considerations. A broad range of options is being considered to address the ageing facilities in Kenepuru. These include rebuilding on the current site and subdividing surplus land, shifting elsewhere within the region or potentially co-locating with other science organisations.

People and capability

The quality of our staff is crucial to our success. We will continue to develop leadership capabilities across ESR and improve the engagement of everyone. We will build a higher performing and client-oriented organisational culture. Additional details are provided in the [Our People](#) section of this SCI.



OUTCOMES AND IMPACTS

OUTCOME ONE Health

Safeguard the health of New Zealanders through improvements in the management of biosecurity and threats to public health.

Impacts

- Reduced burden of illness and communicable diseases
- Reduced human biosecurity risks
- Reduced risks to human health from radiation
- Improved response to pandemics
- Safer medicines through pharmaceutical testing
- Better informed decisions on complex public and environmental health issues
- Reduced spread of foodborne illness

OUTCOME TWO Forensics

Increase the effectiveness of forensic science services applied to safety, security and justice investigations and processes.

Impacts

- More crime prevented and solved
- Criminal investigations are supported by independent, reliable evidence
- Better forensically informed court decisions
- Findings by Coroners are informed by reliable toxicology
- Reduced drug and alcohol dependency of offenders

OUTCOME THREE Food Safety

Enhance protection of New Zealand's food-based economy through the management of food safety risks associated with traded goods.

Impacts

- New Zealand's reputation for high-quality food exports is enhanced
- Foodborne illness risks to human health and the financial burden on society are reduced
- Episodes and outbreaks of foodborne illness are diagnosed and mitigated

OUTCOME FOUR Water and the environment

Improve the safety of freshwater and groundwater resources for human use and the safer use of biowastes.

Impacts

- New Zealanders have assurance that drinking water is safe
- Improved water quality in rivers, streams and groundwater
- Safer use and disposal of biowastes
- Reduced threats to human health and the environment from chemicals, microbes and physical contaminants

OUTCOME ONE: **HEALTH**

Safeguard the health of New Zealanders through improvements in the management of human biosecurity and threats to public health.



Impacts

Our work improves public health by reducing the harm and costs of infectious diseases. Using our reference laboratory information, the Notifiable Diseases Database and information collected from laboratories, our scientists and clinicians collect, collate and analyse data and intelligence on infectious diseases present in New Zealand, including influenza, gastroenteritis and hepatitis. Our clinicians provide advice, support and recommendations to public health clinicians, DHBs and primary care health professionals to support their local and regional health care interventions.

Our extensive health surveillance and data collation networks allow us to identify and characterise individual strains and cases of disease, track any changes in incidence, prevalence or spread, detect, analyse and alert public health authorities to pathogen outbreaks and assess the effectiveness of control measures including the use of vaccines. With early detection, hazards and diseases can be mitigated and sometimes prevented altogether.

ESR also provides the clinical and scientific capability and expertise necessary for New Zealand to respond effectively to disease outbreaks, pandemics and contamination events.

Our work is focused on the following impacts:

- Reducing the burden of infectious diseases
- Improving the ability to respond to infectious disease outbreaks
- Reducing the burden of foodborne illness outbreaks
- Improving human biosecurity
- Mitigating risks to human health from radiation
- Improving the safety of medicines
- Improving safety through workplace drug testing
- Improving the understanding of complex and challenging public and environmental health issues.

Activities

To achieve these impacts our scientists:

- Operate New Zealand's notifiable disease surveillance system (EpiSurv)
- Study the epidemiology of infectious diseases
- Track and report on trends in notifiable diseases
- Conduct microbial identification and characterisation, including genomic analysis

- Maintain New Zealand's nationally significant Reference Culture Collection of medically important bacteria
- Provide accredited reference laboratory services
- Coordinate national and regional outbreak investigations on behalf of the Ministry of Health and local authorities
- Conduct research into faecal source tracking (FST) and use FST to support local authority resource management and outbreak investigations
- Plan for surge capability and capacity in the event of a major outbreak crisis
- Provide radiation testing, advice, training, calibration, regulatory support and dosimetry services
- Test the safety of medicines and other therapeutic products against international quality and safety standards, including testing to identify counterfeit and adulterated medicines
- Provide workplace drug testing services
- Assist decision-makers to address challenging problems that involve high levels of complexity and uncertainty.

We provide public health science services to central government under contracts with key government health and biosecurity agencies. Through these contracts we deliver core health science services at local and community levels to district health boards (DHBs), public health services and local government. Our partnerships are centred on the DHB-based public health units, university collaborators, research partners in primary care, the Health Research Council and the United States Centers for Disease Control and Prevention. In the future we will strengthen and broaden our partnerships with DHBs, the primary care sector and provider partners.

Vision

ESR will ensure New Zealand's scientific and clinical response capability, with regard to human health, remains effective, on par with international standards and is enhanced to take account of new emerging threats. Insights and solutions will be provided to counter the spread of antimicrobial resistance, informing public health policy and response measures. A national approach to human genomics will be in place, enabling genetic data to be linked to New Zealand's health data.

Planned initiatives

To improve public health outcomes we will:

- Implement new technologies for the detection and characterisation of microorganisms, including new, re-emerging, and rare infectious agents
- Evaluate and compare point-of-care testing (POCT) devices as existing diagnostic technologies become miniaturised and connected to the internet. ESR will combine its national-level surveillance capability with real time high resolution data collected from POCTs
- Enhance and extend our bioinformatics capabilities relating to microbial pathogens including outbreak investigation, antimicrobial resistance and population analysis
- Enhance and extend our health informatics and bioinformatics capabilities
- Develop expertise and understanding of all aspects of antimicrobial resistance

- Adopt a One Health approach to addressing public health issues by integrating information from human health surveillance, environmental and veterinary sources to provide a unified approach to infectious disease detection, characterisation and mitigation
- Develop clinical, science and technological services to support advanced research, data analysis, visualisation, and information processing
- Underpin our service delivery with a sound scientific research and clinical base
- Develop capacity for data mining human genomic data.

Initiatives relating to health information systems include:

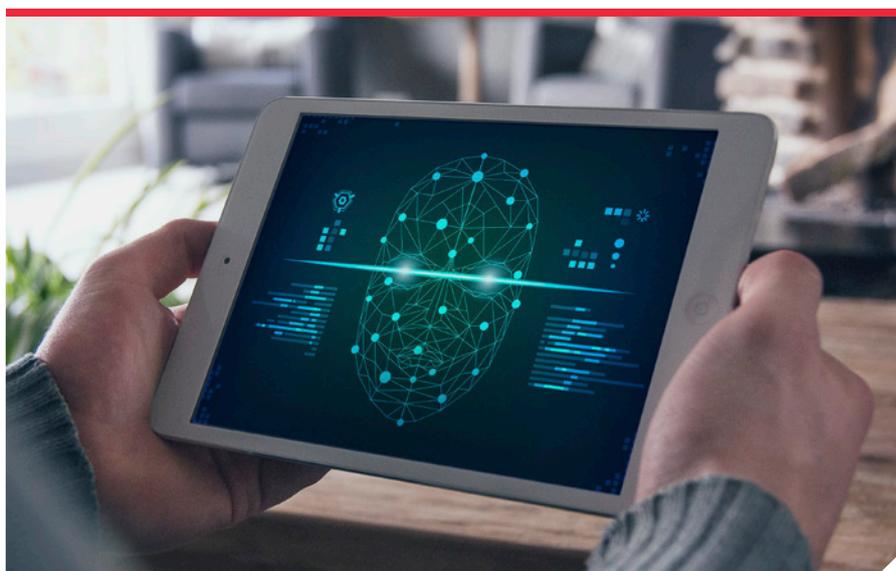
- Developing and maintaining a fully integrated notifiable disease surveillance system with health sector clinical information systems
- Enhancing our laboratory information management system (STARLIMS Health), including mobility, new tests, analytics and improved reporting.
- Phasing the introduction of genomic technology to identify and test human pathogens. The use of this technology will dramatically improve our ability to analyse, map and respond to the impact of human pathogens in our food chain and in community, hospital and population health settings. Targeted investment of SSIF funding in our Genomics and Informatics capabilities will maximise the impact our scientists and clinicians make on health outcomes.

Performance measures

National Health Strategic Impact indicators	<ul style="list-style-type: none"> ▪ Results of the burden of disease and health surveys are improved ▪ Increases in the number of influenza vaccines administered ▪ Increased immunisation rates of eight-month-olds (target 95%) ▪ Rheumatic fever is reduced by two-thirds by 2017 ▪ Improved ability to respond to unexpected events
ESR performance indicators	<ul style="list-style-type: none"> ▪ 100% of time-critical turnaround times are met ▪ Ministry of Health rates ESR's support for responses as 'Good' ▪ Ministry of Health satisfaction with ESR services rates as 'Good' or better ▪ >95% of Ministry of Health's project brief milestones and deliverables consistently met ▪ Genomic analysis becomes part of routine service delivery for our clients by 2018

OUTCOME TWO: **FORENSIC SCIENCE**

Increase the effectiveness of forensic science services applied to safety, security and justice investigations and processes.



Impacts

Our forensic science services improve justice outcomes by playing an important part in reducing crime, delivering a trusted and internationally respected justice system, protecting New Zealand's security and providing a more responsive, effective and efficient justice system. We provide a wide range of forensic services from crime prevention to crime scene investigation and providing expert evidence in court.

Our work helps achieve New Zealand's Better Public Services goals to reduce total crime, violent crime, youth crime, reoffending and assaults on children.

The impacts of our work are:

- Criminal investigations are informed by highly reliable, independent evidence
- Early elimination of the innocent and the inclusion of suspects
- Better forensically informed court decisions
- Reduced drug and alcohol abuse of offenders
- Inquiries by Coroners are informed by reliable toxicology
- Improved crime prevention through the Evidence Based Policing Centre

Activities

We provide forensic services to the justice sector including New Zealand Police, courts, the New Zealand Customs Service, Coroners, pathologists and prisons.

To achieve these impacts our scientists:

- Identify, interpret and collect evidence from crime scenes, including clandestine methamphetamine laboratories and firearms scenes
- Provide analytical expertise in DNA, trace evidence, toxicology and drugs
- Maintain New Zealand's DNA Profile Databank
- Provide expert evidence in court
- Test offenders participating in the Alcohol and Other Drug Treatment Court pilot scheme for alcohol and drugs
- Prevent drugs coming across our border by working closely with the New Zealand Customs Service.

We work with clients from multiple sectors and organisations to provide testing services for alcohol, illicit drugs and certain legal drugs that have the potential to impair performance. Our testing may indicate that an employee's

ability to carry out their duties safely is compromised, presenting a danger not only to the employee but also potentially to work colleagues and the public.

Our forensic services are compliant with the international quality accreditation requirements of the Laboratory Accreditation Board of the American Society of Crime Laboratory Directors (ASCLD/LAB).

Vision

Forensic intelligence, the art of using science and technology to understand and predict patterns of behaviour and crime, will be embedded in our science allowing us to better utilise forensic science to prevent, detect and solve crime. In partnership with our stakeholders, rapid, point of care solutions will be deployed, together with high end science consultancy. ESR will provide a responsive and flexible approach to crime scene science. ESR's forensic services and expertise will be in demand worldwide.

Planned initiatives

To improve forensic outcomes we will continue to develop and progress our scientific capability and expertise.

New developing capabilities include:

- Developing forensic DNA capabilities and specialist expertise in DNA interpretation, particularly in the interpretation of mixed DNA samples obtained from crime scenes. As a result we are better able to support

criminal investigations by identifying up to four individual DNA profiles from a mixed sample. We have earned a reputation as a world leader in this field and are partnering with agencies in Australia and the United States to provide specialist services

- Identifying tissue sources of biological fluids and cells with specific and sensitive new technologies such as RNA analysis and cell-specific fluorescent labelling methods, enabling both the definitive identification of cell types of forensic significance and the separation of specific cell types in mixed case samples prior to DNA profiling
- Exploring opportunities in the area of massively parallel DNA sequencing techniques to maintain our position as a world leader in forensic DNA analysis, including the prediction of physical characteristics of alleged offenders based on the DNA sequences obtained from case samples, leading to faster identification of alleged offenders
- Developing advanced crime scene recording and expert evidence presentation tools. The tools apply scene-scanning technology to record locations of evidence in a way that allows people (such as jurors) to visit a virtual crime scene and clearly see the relationships between items of evidence, and make complex forensic evidence easier to understand. These technologies will lead to faster crime scene investigations, a simplified capture of accurate data, better

presentations of key issues to the jurors, and a more efficient delivery of evidence at trial, saving time and cost. We are examining opportunities to commercialise the technology.

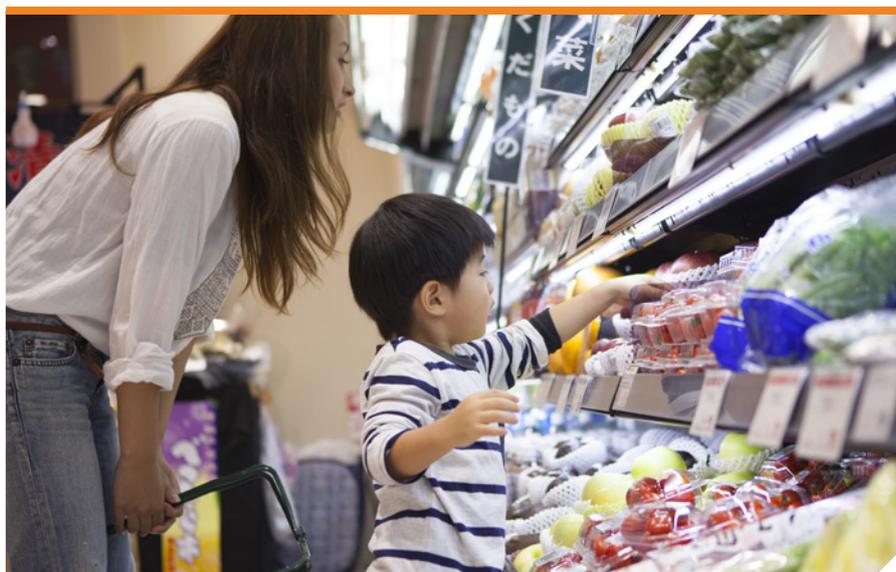
New Zealand Police are implementing an Evidence Based Policing initiative which will examine the best evidence available to support operational and strategic decisions. ESR is a strategic partner in the Evidence Based Policing Centre.

Performance measures

Impact indicators	<ul style="list-style-type: none"> ▪ Total crimes reduced ▪ Assaults on children reduced ▪ Violent crime reduced ▪ Youth crime reduced
ESR performance indicators	<ul style="list-style-type: none"> ▪ 70% of DNA samples are linked to a person ▪ 30% of DNA samples are linked to other crimes ▪ 100% fulfilment of contractual obligations under the service level agreement ▪ 90% Police satisfaction with ESR's timeliness and quality of service

OUTCOME THREE: **FOOD SAFETY**

Enhance protection of New Zealand's food-based economy through the management of food safety risks associated with traded goods.



Impacts

ESR's food science work enhances the reputation of New Zealand food exports, contributes to the Business Growth Agenda and improves the safety of food consumed in New Zealand. We provide research, advisory, monitoring and diagnostic services to the Ministry for Primary Industries, the Ministry of Health and the food industry. We develop interventions to avoid, detect, mitigate and respond to foodborne hazards.

Our expertise spans bacterial, viral, chemical, physical and radiological hazards in food. We have extensive national and international collaborative networks and access to a suite of tests accredited against international standards to help find out how, where and when food contamination has happened, as well as identify the type of contaminant and its source.

The impacts of our work are:

- Improved integrity and reputation of New Zealand's food exports
- Reduced risks to human health from contaminated food
- Episodes of illness and outbreaks caused by contaminated food are rapidly diagnosed and mitigated.

Activities

To achieve these impacts our scientists:

- Develop methods specifically to meet food safety requirements for overseas market access for New Zealand's primary product exports
- Develop new methods to improve the identification and detection time and allow for better mitigation of food safety risks and spoilage
- Conduct research and provide consultancy services to mitigate on-farm and in-plant sources of food contamination
- Detect foodborne pathogens and chemical hazards including radiological hazards present in foods and clinical samples
- Provide an effective emergency response to foodborne illness outbreaks
- Use human health surveillance to understand the epidemiology of foodborne illnesses
- Develop early warning systems to identify emerging foodborne hazards
- Provide information on levels of essential nutrients, trace elements and contaminants in New Zealand's food supply by assisting the Ministry

for Primary Industries to conduct the New Zealand Total Diet Survey

- Assist regulatory and emergency decision making with sound, independent scientific evidence
- Provide information for better national, regional and global policy development.

We will deliver solutions solved through science and research to New Zealand's food producers, manufacturers and exporters. We will continue to support the Ministry for Primary Industries, New Zealand's food safety regulators and the Ministry of Health. As full partners in the Food Safety Science Research Centre (FSSRC) we provide expert food safety science and research services to New Zealand's food industry and the New Zealand government. We collaborate actively with other research organisations including Massey University, AgResearch, AsureQuality, Plant & Food Research and the Cawthron Institute (partners in FSSRC) and Otago University through One Health Aotearoa. We will continue to develop relationships with leading food science organisations around the world.

Vision

ESR will develop enhanced technologies which eliminate infectious diseases and other contaminants from food and identify the source and composition of food products.

Planned initiatives

To improve food safety outcomes we will:

- Develop more sensitive, rapid and informative tools for the detection and characterisation of foodborne hazards and food components
- Develop and implement new risk assessment, risk modelling and risk mitigation tools
- Develop capability in meta-'omics of foods and food production environments
- Develop skills in economics relating to the burden of diseases including the cost/benefit of interventions
- Expand our bio-control tools beyond bacteriophages¹ to tackle a wider

range of pathogenic and spoilage microorganisms

- Develop our understanding of the impact of climate change on food safety and security
- Incorporate a One Health perspective into food safety issues, integrating information from human health surveillance, environmental and veterinary sources to provide a unified approach to risk detection and mitigation
- Collaborate with the NZ Food Safety & Science Research Centre to ensure ESR's work is aligned to their goals

¹ A bacteriophage (phage) is a virus that infects and replicates in a specific bacterium and kills it in the process.

Performance measures

<p>Impact indicators</p>	<ul style="list-style-type: none"> ▪ Increased value of primary industry exports (the Ministry for Primary Industries' goal is to double primary industry exports by 2025) ▪ Enhanced integrity, assurance and reputation of New Zealand's primary products ▪ Reduced human health risk ▪ Reduced financial burden on society from foodborne illnesses
<p>ESR performance indicators</p>	<ul style="list-style-type: none"> ▪ Two new projects addressing food safety needs for regulators and industry ▪ Increased iwi/hapū participation in ESR's food related projects.

OUTCOME FOUR: **WATER AND THE ENVIRONMENT**

Improve the safety of freshwater and groundwater resources for human use and the safer use of biowastes.



Impacts

ESR's science services improve water quality in New Zealand and reduce the amount of biowaste disposed in landfill. We provide health authorities, local and central government, industry and communities with scientific advice and expertise on the management of drinking water, freshwater, groundwater, wastewater and biowaste. Our work includes the surveillance and reporting of drinking-water quality, information systems management, scientific advice on health and environmental public policy, research on water quality issues related to drinking water and recreational waters through source tracking of contaminants.

Our scientists lead and collaborate in the Centre for Integrated Biowaste Research (CIBR) to improve the sustainable management of the biowaste component of waste sent to landfills in New Zealand.

The impacts of our work are:

- New Zealanders have assurance that drinking water is safe
- The water quality of rivers, streams and groundwater is improved
- Reduced biowaste volumes going to landfill through safer use of biowastes
- Environmental threats to human health from chemicals, microbes and physical contaminants are mitigated.

Activities

To achieve these impacts our scientists:

- Support the surveillance and reporting of drinking-water quality by the Ministry of Health
- Provide scientific advice and services to the Ministry of Health's Office of Radiation Safety
- Provide the Ministry of Health and DHBs with analysis, advice and risk assessments in relation to environmental, water, wastewater and hazardous substance issues
- Use internationally recognised approaches for public health risk assessments of microbial (bacterial and viral) and chemical hazards in water
- Develop and use new, internationally recognised methods for the detection of human pathogens and chemical hazards present in water, sediment, soil, biowastes and wastewater
- Conduct research to characterise contaminant pathways from land into and through groundwater and surface water systems, and the connections between these systems
- Conduct research to manage the safe and sustainable use of biowastes, such as biosolids and grey-water resources

- Research the impacts of hazards in the environment on human health (including air quality, contaminated land and common chemicals)
- Operate six monitoring stations that measure radiation levels as part of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO)
- Monitor the National Data Centre for nuclear and radiation monitoring on behalf of the Ministry of Foreign Affairs and Trade.

We lead and participate in several groundwater research projects in collaboration with other CRIs and universities, and we are an active participant in work to fully integrate freshwater research in New Zealand in partnership with iwi and Māori.

We play a leadership role in the 'Our Land and Water' and 'Biological Heritage' National Science Challenges and support the 'Deep South' National Science Challenge.

Vision

ESR will develop enhanced technologies which improve the quality of drinking water, rivers, streams and groundwater. New treatment options will be developed for wastewater, effluent, greywater, biosolids and sewage sludge with a focus on land application and re-use.

Planned initiatives

To improve outcomes relating to water and the environment we will continue to:

- Assess measures of groundwater assimilation capacity for the key water contaminants of nitrates and microbial pathogens. These measures are used in water management by regional councils and district councils to evaluate options for the disposal of water and waste. We will increasingly partner with engineering firms to provide solutions to, and options for, issues that local authorities face in this area. This requires a wide range of interdisciplinary skills to explore the safe and sustainable application of biowastes to land
- Develop a ground water health index for rapidly assessing groundwater health and identifying of potential contaminant causes
- Develop a low-cost molecular method for targeting microbial identification in mixed samples such as groundwater, wastewater and food
- Analyse and report data from the monitoring of drinking-water supplies in New Zealand in the form of an annual report for the Ministry of Health
- Provide advice to DHBs and local authorities on the investigation and management of issues related to air, land and water quality

- Collaborate with Pacific Island nations' governments to support improved local water and sanitation services and infrastructure
- Develop our skills in environmental genomics, including metagenomics-based approaches, to understand microbial communities in water, determine sources of contamination, and identify potential associated health risks
- Work with the University of Canterbury, Environment Canterbury, Christchurch City Council and other clients to aid the recovery of water quality and safety in Canterbury.

Performance measures

<p>Impact indicators</p>	<ul style="list-style-type: none"> ▪ Quality of drinking water is compliant with the standards ▪ Freshwater ecosystems are healthy and resilient to pressures ▪ Risks to people and the environment are known, understood and well managed ▪ Decreased volume of biowaste going to landfill ▪ Harmful health impacts from people's contact with freshwater are eliminated
<p>ESR performance indicators</p>	<ul style="list-style-type: none"> ▪ ESR scientists are invited on to advisory panels and act as expert witnesses ▪ Project work related to environmental health is increased with a target of four new projects e.g. Pacific, China and South East Asia ▪ Water quality advice and analytical services are provided to more regional or unitary councils with a target of five new contracts ▪ Increased iwi/hapū participation in ESR's water related projects

VISION MĀTAURANGA

Building on the work from the previous year, ESR is beginning a period of sustained effort to improve outcomes for Māori from our science and research.

Investment in the Māori economy is consistent with ESR's core purpose, government expectations and organisational direction and has never been more compelling.

A Māori Economy Manager has been employed to support ESR develop an active programme of engagement with and investment in Māori to ensure ESR's science supports better outcomes for Māori. ESR now has the capacity and capability to actively seek out

opportunities to support the growth of both the Māori and wider New Zealand economy through the provision of science solutions to Māori clients.

To build credibility within the Māori economy, ESR will strengthen relationships and client awareness. The Māori economy is diverse and sustained engagement with Māori clients is key to understanding and connecting Māori to ESR's science capabilities.

ESR will invest in the development of Vision Mātauranga capability to ensure a growing awareness of Māori interests is embedded across research and science programmes.

We will examine each of ESR's four outcomes and identify impacts, initiatives and performance measures aligned with Vision Mātauranga.

To increase our contribution to Vision Mātauranga and improve outcomes for Māori we will focus on five objectives:

<p style="text-align: center;">ENGAGE</p> <p style="text-align: center;">Engage with Māori to understand the challenges of primary interest</p>	<p style="text-align: center;">PROMOTE</p> <p style="text-align: center;">Promote the utilisation of ESR's existing science based solutions and technologies, and invest in the development of new technologies, information and research to add value to Māori assets</p>	<p style="text-align: center;">FACILITATE</p> <p style="text-align: center;">Facilitate internal organisational collaboration, as well as external organisational relationships to maximise opportunities to partner and collaborate on work in key areas of interest to Māori</p>	<p style="text-align: center;">COORDINATE</p> <p style="text-align: center;">Coordinate Māori engagement across ESR</p>	<p style="text-align: center;">INVEST</p> <p style="text-align: center;">Invest and allocate internal resources to develop meaningful relationships with Māori clients</p>
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Performance measures

Targets

SSIF investment is aligned and supports ESR to embed Vision Mātauranga policy and secure Vision Mātauranga outcomes.	<ul style="list-style-type: none"> ▪ Kaupapa Māori and/or Māori led projects represent 10% of all SSIF funded projects by 2024 ▪ All projects deemed to be of interest to Māori, are allocated resource to secure Māori participation and active involvement by 2024
Māori stakeholder satisfaction with engagement	<ul style="list-style-type: none"> ▪ Māori stakeholder satisfaction with engagement exceeds baseline set in 2017/18
Vision Mātauranga capability within ESR is increased through training and recruitment	<ul style="list-style-type: none"> ▪ At least 20 people participate in a programme to develop Māori awareness and engagement and engagement capability annually ▪ Increase current Vision Mātauranga capability through SSIF by 2 FTE by 2024

OUR PEOPLE

A continued focus on people and ESR culture is a critical success factor for us. To meet the science needs of New Zealand, deliver to our clients and increase revenue, we need to strengthen our capabilities by attracting, retaining and developing a high-performing and engaged workforce.

Organisational culture

Organisational culture continues to be a major driver of performance.

The level of engagement, connection and commitment that our staff experience will directly impact our performance and effectiveness. Therefore our focus is on ensuring that we have a thriving positive culture that is highly innovative, collaborative and agile and means ESR is a great place to work.

Our unifying vision and refreshed organisational values are fundamental to defining our character and what will contribute to our success. Our shared values will help guide the behaviours of our people and ensure we are trusted advisors delivering leading edge science solutions and quality services that make a difference for New Zealand:

- ▶ **We push boundaries** – meeting challenges with fresh thinking and creative approaches
- ▶ **Our quality counts** – standing out through our excellence and world class expertise
- ▶ **We do the right thing** – upholding integrity and independence no matter what
- ▶ **Our team spirit** – great people working together as one team

Bringing the values to life and embedding them in all that we do, will enhance innovation and encourage a 'one ESR' approach.

Leadership & capability

Our performance as a team determines our ability to deliver on our goals. Creating a highly engaged team with the right skills, commitment, leadership and

support increases our ability to deliver to our clients.

We will continue to invest in the development of our leaders to ensure they have the skills and mindset to build the capability of their teams, lead our culture, and facilitate growth, change and innovation. Leadership is the single most critical driver of successful change and it is essential that we build a commitment to our change vision and equip our managers to lead the change and support our people through upcoming change initiatives.

It is critical that we define our workforce requirements to support areas of change and business growth and drive excellence and accountability through individual performance plans. These plans recognise delivery against key performance indicators and the demonstration of ESR's values, along with a focus on development so staff achieve their full potential.

Science capability

The Chief Scientist and the Strategic Science Team will continue to conduct regular capability reviews to ensure ESR has the science capabilities and skill-base to meet current and future needs. Science capabilities we will grow include genomics and informatics, statistics and social science.

We maintain relationships with universities, other CRIs and scientific research societies and will promote new collaborations that support our outcomes. We fund post-graduate studentship opportunities, encourage active participation in national and international conferences and encourage staff to undertake meaningfully aligned PhD studies. We encourage and support scientists who have new ideas for science, particularly those at earlier stages of their careers, by funding their research through our Pioneer Fund.



RESOURCES

Information technology

The successful delivery of our science services has become inextricably linked with technology as science continues to evolve. The evolution from the workbench to the workstation, combined with the exponential increase in the storage space required to support genomics science, will require significant change within our IT systems, information management and their governance. In response we have adopted the All of Government Infrastructure as a Service offering to provide on demand access to high capacity, high performance IT resources. We will continue enhancing and optimising our Public Health service offerings, redeveloping EPISurv into a modern and robust disease surveillance technology platform that is capable of supporting a system of national significance. We will also continue to modernise our corporate systems and enhance IT service levels, supporting open data research initiatives and encouraging efficiencies and collaboration. Our IT Strategy explains in more detail how we will enhance our five key technology platforms:

- Laboratory Information Management Systems Platform
- Forensic Platform
- Surveillance Platform
- Informatics Platform
- Core Business Systems.

Property and facilities

ESR continues to focus on maximising the efficiency and utility of its science facilities in Auckland, Wellington and Christchurch. The property strategy will take account of the future operating model, proximity to major clients, access to skilled staff, ability to support growth into international markets, the potential for using hubs and co-locating with other science organisations, business continuity and financial considerations. A broad range of options is being considered for addressing the ageing facilities in Kenepuru, including rebuilding on the current site and subdividing surplus land, shifting elsewhere within

the region, or potentially co-locating with other CRIs.

The overarching goals of our property strategy are to:

- determine the most efficient and effective site use to meet business needs
- ensure that facilities support the specialised scientific capabilities required for excellent service to clients
- apply whole-of-life asset management practices to ensure that the assets remain robust and reliable to support our core business functions and long-term strategic science goals.

Intellectual property

We have policies and procedures in place relating to the access, use, maintenance, enhancement, exploitation and transfer of intellectual property and know-how. These policies and procedures ensure effective product and service development and the effective management of intellectual property. They also maximise the application of the results of research and technological developments, including transfers to end users and other third parties for the benefit of New Zealand. General principles and procedures relating to the intellectual property, research and benefits of research held by ESR meet the requirements of the Transfer Agreement between ESR and the Crown.

National reference collections

We maintain the New Zealand Reference Culture Collection (Medical section). We also assist other CRIs, universities and laboratories by providing access to the cultures in the collection on a cost-recovery basis. We will provide access to the reference collection except where access is clearly not to the benefit of New Zealand. The costs of collection, archiving and maintenance will be recovered only to the extent that they have not been paid for from public funding. Costs for retrieval of information from databases and reference collections will be recovered where a third party wishes to obtain large portions of information from a database or reference collection for direct commercial use.

In this case we reserve the right to negotiate a copyright, royalty or licence fee. We will not dispose of any national database or reference collection without the prior written consent of shareholding Ministers, and will immediately notify shareholding Ministers if, in the Board's view, we cannot reasonably maintain the integrity, security and quality of any national database or reference collection. We will remain responsible for the reference collection until after shareholding Ministers have notified the Board of their determination regarding the future maintenance of, or access to, the database or reference collection.

We will advise shareholding Ministers in a timely manner of any disputes over access to, or the use of, the reference collection held by us. Under the terms of the Transfer Agreement, shareholding Ministers can appoint a person with relevant expertise to decide the matter.

MEASURING PERFORMANCE

Non-financial performance measures

Performance measures relating to the outcomes for forensic, health, food and water are included in the respective outcome sections of this report. We also monitor our performance against the generic CRI performance indicators.

Generic CRI performance indicators

		2017 FORECAST	TARGET 2017/18
End user collaboration	Revenue per FTE from commercial sources	\$41,149	\$52,455
Research collaboration	Publications with collaborators	65	65
Technology and knowledge transfer	Commercial reports per scientist FTE	0.45	0.45
Science quality	Impact of scientific publications (measured using Web of Science citations for the previous calendar year)	3.1	3.1
Financial indicators	Revenue per FTE	\$200,611	\$200,344
	Commercial revenue	\$15.3m	\$21.0m

Financial performance measures

Our five-year financial plan has been prepared based on capital expenditure and revenue growth assumptions that are congruent with our strategic direction.

Revenue

Revenue is forecast to grow from \$74.6m in 2016/17 to \$100.1m in 2021/22 as a result of commercialising our intellectual property, forming new partnerships and attracting new international clients for our science services. As two of our clients (Ministry of Health and New Zealand Police) provide a significant proportion of ESR's revenue we will continue to broaden our revenue base to mitigate commercial risks. Growth targets have been set across ESR's portfolio of services. Revenue from our forensic software STRmix™ has been budgeted in line with the Business Plan, except for 2021/22 when expected growth has been moderated to reflect the higher risk nature of commercial products.

Operating expenditure

Operating expenditure is budgeted to increase from \$63.4m in 2016/17 to \$80.6m in 2021/22. Operating expenditure budgeted in the out-years reflects the activities needed to drive revenue growth.

Profitability

NPAT is forecast to increase from \$3.8m in 2016/17 to \$7.3m in 2020/21. In 2021/22 a one-off reduction in profit is expected due to the \$5m write-off of the Kenepuru Science Centre which will be replaced by modern sustainable science facilities. Return on equity is expected to average 8.4% over 2017-2022. This favourable outlook is underpinned by the growth of ESR's commercial activities, while the return on ESR's core contracts continues to be challenged by the fiscal constraints of our key clients.

Balance sheet management

The major items of capital expenditure reflect our property strategy. This includes addressing the ageing facilities in Kenepuru and Christchurch.

Cash flow

ESR continues to have strong operating cash flows. No debt is required at this stage to fund the capital investment programme to strengthen the core science delivery and support future growth and new business initiatives.

Dividend

It is not anticipated that ESR will be in a financial position to have funds available for distribution due to the planned reinvestment in IT and property.

Risks

The main financial risks are that actual revenue may differ from that forecast and actual property costs may differ from current estimates.

Financial Performance Indicators 2017 - 2022

	Forecast 16/17	Plan 17/18	Plan 18/19	Plan 19/20	Plan 20/21	Plan 21/22
Revenue (\$000s)	74,627	80,154	85,312	91,855	96,210	100,088
Revenue Growth		7.4%	6.4%	7.7%	4.7%	4.0%
Operating Results (\$000s)						
Operating Expenses	63,448	68,986	71,884	75,328	78,005	80,638
EBITDAF	11,179	11,167	13,428	16,527	18,205	19,450
Depreciation and Amortisation	5,999	6,102	6,892	7,691	8,340	13,899
EBIT	5,181	5,065	6,535	8,836	9,865	5,551
Net Profit after Tax	3,806	3,897	5,001	6,619	7,312	4,011
Total Assets	68,542	73,189	78,190	84,809	92,121	96,132
Closing Shareholders Funds	48,796	52,693	57,694	64,313	71,625	75,636
Capital Expenditure	5,580	7,051	14,548	17,595	29,275	13,649
Capital Expenditure % to revenue	7.5%	8.8%	17.1%	19.2%	30.4%	13.6%
Liquidity						
Current Ratio	1.8	2.0	1.8	1.6	0.7	1.0
Quick Ratio (Acid Test)	1.7	1.9	1.7	1.5	0.6	0.9
Profitability						
Return on Equity	8.1%	7.7%	9.1%	10.8%	10.8%	5.4%
Return on Total Assets	8.2%	7.1%	8.6%	10.8%	11.2%	5.9%
Operating Margin	15.0%	13.9%	15.7%	18.0%	18.9%	19.4%
Operating Margin per FTE (\$)	30,052	27,913	32,179	38,269	41,285	43,200
Operational Risk						
Profit Volatility	1.8%	0.1%	10.9%	19.4%	22.5%	21.7%
Coverage						
Interest Cover	N/A	N/A	N/A	N/A	N/A	N/A
Growth/Investment						
Capital Renewal	1.0	1.2	2.1	2.3	3.5	1.0
Dividend	-	-	-	-	-	-
Financial Strength						
Gearing (Debt/Debt Equity) %	N/A	N/A	N/A	N/A	N/A	N/A
Equity Ratio (Equity/Total Assets) %	73%	72%	73%	75%	77%	78%
Cash and short term deposits (\$Ms)	19.4	22.5	19.9	16.6	3.0	7.2
Debt (\$Ms)	-	-	-	-	-	-

APPENDIX 1:

BUSINESS POLICIES

We operate in accordance with the purpose and principles as stated in the Crown Research Institutes Act 1992 and have statutory obligations under other acts, including the Companies Act 1993 and Crown Entities Act 2004. Significant services are performed for New Zealand Police under the Land Transport Act 1998 and the Misuse of Drugs Act 1975.

Policies and procedures are in place to ensure we meet all of our statutory obligations.

Our business policies include:

- Risk management
- Shareholder consent for significant transactions
- Dividends
- Information to be disclosed
- Databases and collections
- Health and safety
- Intellectual property
- Information management.

APPENDIX 2

STATEMENT OF SIGNIFICANT ACCOUNTING POLICIES

Reporting entity

ESR is a Crown Entity incorporated and based in New Zealand. Its registered office is 34 Kenepuru Drive, Porirua.

ESR is a Crown research institute that provides specialist scientific services and research to the public health, food safety, security and justice systems, and the environmental sector.

Statement of compliance

The financial statements have been prepared in accordance with the requirements of the Crown Entities Act 2004, the Crown Research Institutes Act 1992, the Companies Act 1993 and the Financial Reporting Act 2013.

These financial statements have been prepared in accordance with Generally Accepted Accounting Practice in New Zealand (NZ GAAP). They comply with International Financial Reporting Standards (IFRS) and other applicable financial reporting standards as appropriate for profit-oriented entities.

The Group has adopted External Reporting Board Standard A1 Accounting Standards Framework (For-profit Entities Update) (XRB A1). XRB A1 establishes a for-profit tier structure and outlines which suite of accounting standards entities in different tiers must follow. The group is a Tier 1 entity. There was no impact on the current or prior year financial statements.

Basis of preparation

The financial statements are Parent and Group financial statements. The subsidiary of ESR is a dormant non-trading entity and consequently there is no difference between the financial statements of the Group and those of the Parent.

The financial statements are prepared on the basis of historical cost, except for financial instruments, certain leased assets and long service leave as identified in the specific accounting policies and accompanying notes.

The financial statements are presented in New Zealand dollars and all values are rounded to the nearest thousand dollars (\$000).

The budget and target figures presented in these financial statements are unaudited.

Changes in accounting policies

Accounting policies have been applied on a basis consistent with the prior year.

Critical accounting estimates and judgements

The preparation of financial statements requires judgements, estimates and assumptions that affect the application of policies and reported amounts of assets and liabilities, income and expenses. The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates. The estimates and assumptions are reviewed on an on-going basis.

The judgements that have the most significant effect on amounts recognised in the financial statements are applied in the determination of revenue and employee benefits.

Revenue

The Group uses the stage of completion method in accounting for its fixed price contracts to deliver scientific services. The use of the stage of completion method requires management to estimate the services performed to date as a proportion of the total services to be performed. The stage of completion is calculated and reviewed monthly, and significant variances are investigated to ensure that the stage of completion estimate is reasonable in line with the overall project plan, estimated completion date and prior measurements of progress.

Principles of consolidation

Subsidiaries

The consolidated financial statements incorporate the assets and liabilities of all subsidiaries of ESR as at 30 June 2016 and the results of the operations of all subsidiaries for the year then ended.

Subsidiaries are those entities controlled, directly or indirectly, by the Parent. Subsidiaries are consolidated from the date on which control is transferred to ESR. They are de-consolidated from the date that control ceases.

The acquisition method of accounting is used to account for the acquisition of businesses by the Group. The cost of an acquisition is measured as the fair value of the assets given, equity instruments issued and liabilities incurred or assumed at the date of exchange. Identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date, irrespective of the extent of any non-controlling interest. The excess of the cost over the fair value of the Group's share of the identifiable net assets acquired is recorded as goodwill. If the cost of acquisition is less than the Group's share of the fair value of the identifiable net assets of the subsidiary acquired the difference is recognised directly in the statement of profit or loss and other comprehensive income.

Property, plant and equipment

Items of property, plant and equipment are initially recorded at cost and subsequently at cost less accumulated depreciation and impairment. The cost of property, plant and equipment includes the value of consideration given to acquire the assets and the value of other directly attributable costs that have been incurred in bringing the assets to the location and condition necessary for their intended use.

The carrying amounts of property, plant and equipment are reviewed at least annually to determine if there is any indication of impairment. Where an asset's recoverable amount is less than its carrying amount, it will be reported at its recoverable amount and an impairment loss will be recognised.

Losses resulting from impairment are reported in the statement of profit or loss and other comprehensive income.

Realised gains and losses arising from the disposal of property, plant and equipment are recognised in the statement of profit or loss and other comprehensive income in the periods in which the transactions occur.

Depreciation is charged on a straight-line basis at rates calculated to allocate the cost of an item of property, plant and equipment, less any estimated residual value, over its estimated useful life, as follows:

Type of Asset	Estimated useful life
Land	Not depreciated
Freehold buildings	20 - 50 years
Leasehold improvements	10 years
Plant, equipment and vehicles	3 - 10 years
IT equipment and internal software	3 - 10 years

Intangible assets

Computer software

Items of computer software that do not comprise an integral part of the related hardware are treated as intangible assets with finite lives. Intangible assets with finite lives are recorded at cost, and subsequently recorded at cost less

any accumulated amortisation and impairment losses. Amortisation is charged to the statement of profit or loss and other comprehensive income on a straight-line basis over the useful life of the asset (between 3 and 10 years).

Client contracts

The Intangible asset client contracts represents the fair value of future revenue streams from client contracts acquired under business combinations. Initial recognition of the intangible asset is stated at fair value. Subsequent to initial recognition, acquired intangible assets are stated at initially recognised amounts less accumulated amortisation and any impairment. Amortisation of acquired intangible assets is made according to the straight-line method over their estimated useful life, not exceeding ten years.

Research and development costs – internally generated intangible assets

Expenditure on research is expensed when it is incurred.

Development expenditure incurred on an individual project is capitalised if the process is technically and commercially feasible, future economic benefits are probable and ESR intends to and has sufficient resources to complete development and to use or sell the asset.

Any expenditure capitalised is amortised over the period of expected future sales from the related project from the point the asset is ready for use.

Impairment of non-financial assets

Assets that are subject to amortisation are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash-generating units).

Taxation

Current tax

Current tax is calculated with reference to the current period's taxable profit or loss calculated using tax rates and tax laws that have been enacted or substantially enacted by reporting date. Current tax for the current and prior periods is recognised as a liability (or asset) to the extent that it is unpaid (or refundable).

Deferred tax

Deferred tax is calculated using the comprehensive balance sheet liability method in respect of temporary differences arising from differences between the carrying amount of assets and liabilities in the financial statements and the tax base for those items.

Deferred tax assets and liabilities are not recognised if the temporary differences giving rise to them from the initial recognition of assets and liabilities (other than as a result of a business combination) affects neither taxable income nor accounting profit.

Deferred tax assets are recognised for deductible temporary differences and unused tax losses only if it is probable that future taxable amounts will be available against which deductible temporary differences or unused tax losses and tax offsets can be utilised.

Deferred tax assets and liabilities are measured at the tax rates expected to apply when the assets are recovered or liabilities settle using tax rates and tax laws that have been enacted or substantially enacted by reporting date.

Cash and cash equivalents

Cash means cash on hand, demand deposits and other highly liquid investments in which ESR has invested as part of its day-to-day cash management. The following definitions are used in the statement of cash flows:

- Investing activities are those activities relating to the acquisition, holding and disposal of fixed assets and investments.
- Financing activities are those activities that result in changes in the size and composition of the capital structure of ESR and this includes both equity and debt not falling within the definition of cash. Dividends paid in relation to the capital structure are included in financing activities.
- Operating activities are the principal revenue producing activities and other activities that are not investing or financing activities.

Trade and other receivables

Trade receivables are stated at their estimated realisable value after providing against debts where collection is doubtful. An estimate of the value of doubtful debts is made based on a review of debts at year end. Bad debts are written off in the period in which they are identified.

Inventories

Stocks of consumables and work in progress are stated at the lower of cost and net realisable value. Cost is determined on a first in, first out basis.

Trade and other payables

These amounts represent the best estimate of the expenditure required to settle an obligation arising from goods or services provided to ESR prior to period end. These amounts are unsecured and are usually paid within 30 days of recognition. Liabilities and provisions to be settled beyond 12 months are recorded at their present value.

Employee benefits

Wages, salaries and annual leave

Liabilities for wages and salaries including annual leave that are expected to be settled within 12 months of the reporting date are recognised in respect of employees' services up to the

reporting date and are measured at the amounts expected to be paid when the liabilities are settled.

Obligations for contributions to defined contribution retirement plans are recognised in the statement of profit or loss and other comprehensive income as they fall due.

Long service leave, retirement leave and service leave

The liability for long service leave, retirement leave and service leave is recognised as an employee benefit liability and measured as the present value of expected future payments to be made in respect of services provided by employees up to the reporting date. Consideration is given to the expected future salary levels, experience of employee departures and periods of service. Expected future payments are discounted using market yields at the reporting date for Government bonds with terms to maturity and currency that match, as closely as possible, the estimated future cash outflows.

Leases

Finance leases transfer to ESR, as lessee, substantially all the risks and rewards incidental to ownership of a leased asset. Initial recognition of a finance lease results in an asset and liability being recognised at amounts equal to the lower of the fair value of the leased asset or the present value of the minimum lease payments. Each lease payment is allocated between the liability and finance charges so as to achieve a constant rate of finance charge over the term of the lease. Property, plant and equipment acquired under a finance lease are depreciated over the shorter of the useful life and lease term of the asset.

Leases in which a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are charged to the statement of profit or loss and other comprehensive income on a straight-line basis over the period of the lease.

Borrowings

Borrowings are initially recognised at fair value, net of costs incurred. Borrowings are subsequently measured at amortised cost. Any differences between the proceeds (net of transaction costs) and the redemption amount is recognised in the statement of profit or loss and other comprehensive income over the period of the borrowing using the effective interest rate method.

Borrowings are classified as current liabilities unless ESR has an unconditional right to defer the settlement of the liability for at least 12 months after the balance date.

Share capital

Ordinary shares are classified as equity. Incremental costs directly attributable to the issue of new shares or options are shown as appropriate in equity as a deduction, net of tax, from the proceeds.

Revenue

Sales of goods and services

Revenue is earned by ESR in exchange for the provision of outputs (services) to third parties.

Revenue from the supply of services is measured at the fair value of consideration received. Revenue from the supply of services is recognised in the accounting period in which the services are rendered, by reference to the stage of completion of the specific transaction assessed on the basis of the actual service provided as a proportion of the total services to be provided. Any revenue for which services have not been supplied as at the reporting date but for which payment has been received is deferred within the statement of financial position as revenue in advance.

SSIF funding

ESR receives SSIF funding from the government in order to perform scientific research activities. SSIF funding is recognised in the statement of profit or loss and other comprehensive income when the requirements under the funding agreement have been met.

Interest income

Interest income is recognised in the statement of profit or loss and other comprehensive income on a time proportion basis, using the effective interest rate method.

Foreign currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates. The Group financial statements are presented in New Zealand dollars, which is ESR's functional and presentation currency.

Foreign currencies transactions are recorded at the foreign exchange rates in effect at the dates of the transactions. Monetary assets and monetary liabilities denominated in foreign currencies are translated at the rates of exchange ruling at the end of each reporting period. Non-monetary assets and non-monetary liabilities denominated in foreign currencies that are measured at fair value are translated to the functional currency at the exchange rate at the date that the fair value was determined.

Goods and services tax

Items in the statement of profit or loss and other comprehensive income and statement of cash flows are disclosed net of Goods and Services Tax (GST). All items in the statement of financial position are stated net of GST with the exception of receivables and payables, which include GST invoiced.

Dividends

A provision is made for the amount of any dividend declared on or before the end of the financial year but not distributed at balance date.

Financial instruments

The designation of financial assets and financial liabilities by ESR into instrument categories is determined by the business purposes of the financial instruments, policies and practices of management, the relationship with other instruments and the reporting costs and benefits associated with each designation. The designations applied by ESR are reflected in the financial statements.

Financial assets

The Group classifies its financial assets as loans and receivables and at fair value through profit and loss. Management determines the classification of its financial assets at initial recognition.

Loans and receivables are non-derivative financial assets with fixed or

determinable payments that are not quoted in an active market. They are included in current assets, except for maturities greater than 12 months after the reporting date. These are classified as non-current assets. ESR's loans and receivables comprise trade and other receivables and cash and cash equivalents in the statement of financial position.

Regular purchases and sales of financial assets are recognised on the trade-date – the date on which the Group commits to purchase or sell the asset. Financial assets are derecognised when the rights to receive cash flows from the investments have expired or have been transferred and the Group has transferred substantially all risks and rewards of ownership. Loans and receivables are carried at amortised cost using the effective interest method.

The Group assesses at each reporting date whether there is objective evidence that a financial asset or a group of financial assets is impaired.

Financial liabilities

Financial liabilities held by ESR include trade and other payables, employee benefits and derivatives.

Such financial liabilities are recognised initially at fair value less transaction costs and subsequently measured at amortised cost using the effective interest rate method. Financial liabilities entered into with durations less than 12 months are recognised at their nominal value.

Derivatives

Derivative financial instruments are recognised both initially and subsequently at fair value. They are reported as either assets or liabilities depending on whether the derivative is in a net gain or net loss position. ESR does not use hedge accounting and as such derivatives are classified as held-for-trading financial instruments with fair value gains or losses recognised in the statement of profit or loss and other comprehensive income. Such derivatives are entered into for risk management purposes.

Adoption status of relevant new financial reporting standards and interpretations

The Group has elected not to early adopt any of the new standards and amendments to existing standards which have been issued as at 30 June 2016 but not yet effective. It is not anticipated that standards not yet effective will significantly impact the financial statements of the Group with the exception of IFRS 15.

NZ IFRS 15, Revenue from contracts with clients, (effective for annual periods beginning on or after 1 January 2018)

NZ IFRS 15 addresses recognition of revenue from contracts with clients. It replaces the current revenue recognition guidance in NZ IAS 18 Revenue and NZ IAS 11 Construction contracts and is applicable to all entities with revenue. It sets out a 5 step model for revenue recognition to depict the transfer of promised goods or services to clients in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The Group has yet to assess NZ IFRS 15's full impact. The Group will apply this standard from 1 July 2018.

APPENDIX 3 DIRECTORY

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 John O'Hara
 Richard Gill
 Quentin Hix
 Dr Andrea Grant

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