ICT Sustainabilty:

New Zealand Benchmark 2014

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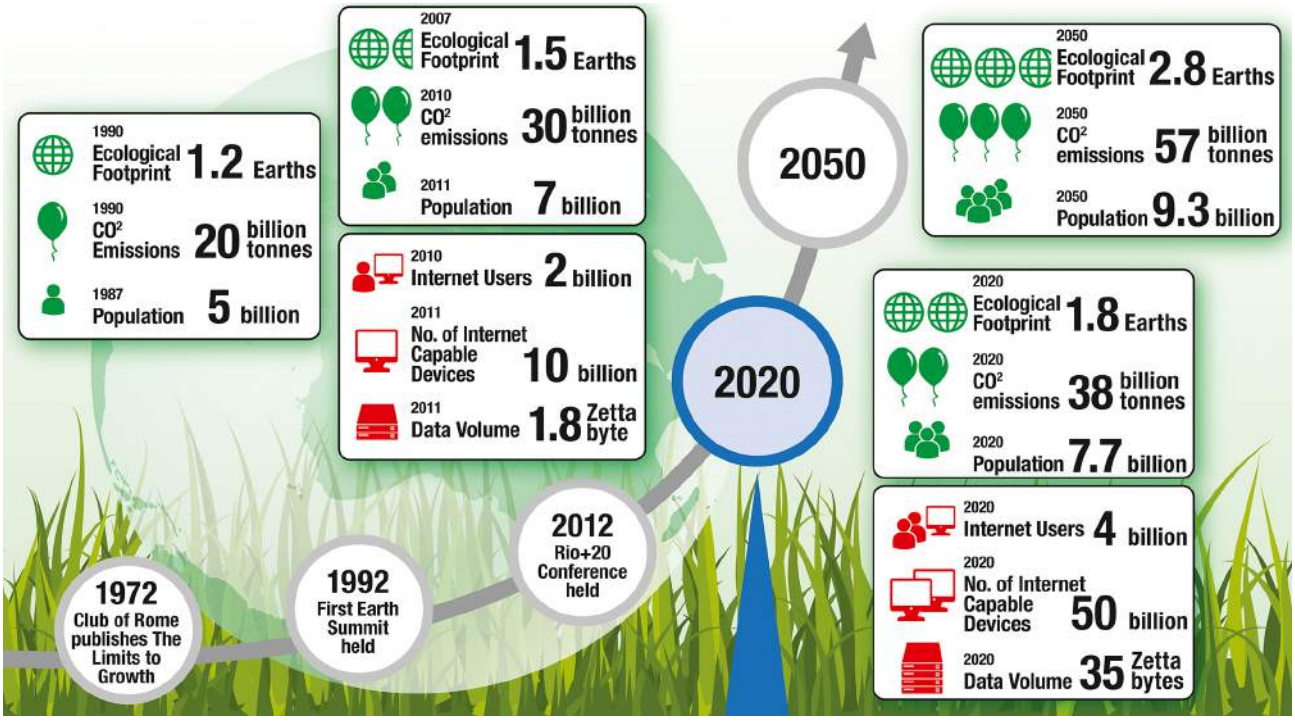
Foreword

Well into the second decade of this new millennium, businesses are facing a number of global issues that are significantly redefining the landscape in which they compete. Sustainability has become perhaps one of today's most pressing social issues, and is now a commonly used term in contemporary business lexicon. And justifiably so.

The world population of 7.2 billion (in mid-2013) is projected to increase by almost one billion people within the next twelve years - and even further to 9.6 billion by 2050. A disconcerting thought considering we are already rapidly reaching the limits of our planet's growth. Greenhouse Gas (GHG) emissions cease to slow, biodiversity loss continues, and food scarcity and natural disasters are becoming all the more prolific. Factoring an ever growing population into this dire mix is making for one lethal cocktail. We are fast reaching the critical tipping point that will put our current way of life and our future society at risk.

Adding fuel to the fire is the growth of ICT (Information and Communications Technology). The proliferation of smart mobile devices, data and our incessant need to be connected 24/7 have resulted in the ICT industry undergoing exponential growth in recent years with no signs of slowing. It is now estimated that ICT as an industry is responsible for around 3% of the world's total global emissions. While this may seem insignificant, to put these figures in perspective, ICT's emissions are comparable to those of the total global aviation industry or the total annual emissions of New Zealand, Australia and Indonesia combined. Further, given current growth rates, experts estimate total emissions will rise to 6% - or in some cases - 10% by 2020. At 10% these emissions will be on par with the global aluminium smelting or cement production industries and India or Russia are added to the aforementioned list. In short, ICT's impact on the environment is of growing concern.



Limits to Growth and Global Capacity (Fujitsu Group Sustainability Report 2013)

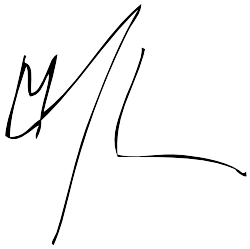
As advances in technology grow stronger by the minute, so too is our capacity to help bridge the gap between ICT and sustainability. We at Fujitsu have a global mission to provide a "Human Centric Society". That is, to harness the power of ICT to the benefit of society as a whole. As part of this wider mission we take the view that it is both our obligation to: reduce and ultimately reverse the current 3% share of emissions, and: play a pivotal role in driving down the remaining 97% of emissions through ICT enabling technology. No longer will ICT only be a contributor to emissions, but it will become a key enabler going forward, allowing business and society to develop and grow while driving down the ultimate impact we as humans have on the environment.

With this in mind it gives me great pleasure to introduce to you the New Zealand ICT Sustainability Benchmark Report. This is the fourth edition of its kind and our objective is simple: to highlight to industry key areas in ICT where performance and efficiency improvements are required, and outline actions that we need to take to play our role in sustainability.

This report takes a critical look at all the key areas of the ICT supply chain. From Lifecycle Management, the Data Centre, End User Computing and Metrics, to how we measure and manage performance and ICT energy use, we've taken a whole systems view. We've also integrated Technology Enablement into this model - an exciting emerging area that looks at how we are utilising technology to support other parts of the business and in other industries. The use of teleconferencing to reduce travel and smart meters for energy monitoring are two modest examples of ICT enablers that reduce environmental load, all while enabling business to harness significant competitive benefits.

Unfortunately this report does not paint a pretty picture for ICT in New Zealand. Our performance in ICT sustainability has gone backwards in all areas. Put nicely, we need to lift our game and take urgent action if we are to make progressive and profitable sustainable advancements across the ICT sector. The aim of this report is therefore to encourage industry to lift the bar, shine the spotlight on what needs to be done and also promote the areas of excellence.

As a final remark, we have seen first-hand while working with our customers, how bringing both the ICT and Sustainability or Environment teams together can provide businesses with a powerful platform for success in ICT Sustainability. Accordingly, in addition to highlighting results and key figures, this report is also intended to serve as a practical guide and collaborative resource for both your IT and Sustainability departments with everyday application and inspiration. Throughout the report you will find a number of expert quotes, helpful tips, advice and quick wins businesses can start doing today to achieve both improved efficiency and competitive gains. Why are we waiting? We have the insight right now to start making a simple yet profound difference and the time to act is now.



Mike Foster
Chief Executive Officer
Fujitsu Australia and New Zealand Limited

New Zealand Commentary

Overall the 2014 New Zealand ICT Sustainability Benchmark study has produced a very disappointing set of results for New Zealand. With the exception of Heavy Industry all sectors surveyed score well below par. Government, along with Wholesale / Retail / Logistics were, in particular, the worst industry offenders with scores falling well below 25 points on the ICT Sustainability Index (ITSx). Accordingly, while there has been a marked decline in a focus on ICT Sustainability across all sectors, the poor performance of both Government and Retail/Logistics have been key in dragging New Zealand's overall ITSx ranking down to record lows.

Needless to say, this report must recognise that in New Zealand some corporations are producing great results. For example while the minimum ITSx score was measured at 11.6 the survey did see one New Zealand company achieve 80.0 which is defined as global best practice.

There are a number of reasons and conclusions that we can draw from these results. Unfortunately for the most part they paint a picture of negligence, waste and missed opportunities for many industries. On a positive note, the area that scored the lowest across the survey - Metrics (at 24.2) - is the one area that can be most rapidly improved at little or no investment cost to businesses. Improvements in this area have the capacity to lift the total ITSx score across the board and improve overall organisational sustainability performance. Simply put, "what gets measured gets managed" and what gets managed gets results. Therefore improvements made in Metrics will enable firms to identify opportunities and cost saving initiatives across the remaining four indices and subsequently improve all ensuing remaining areas.

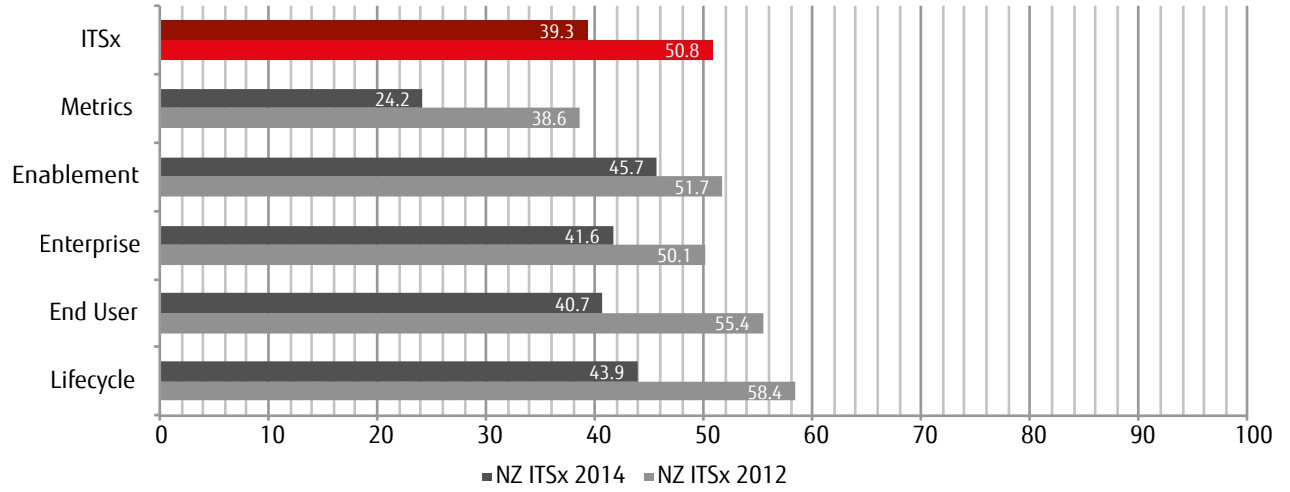
At a Glance - New Zealand Key Numbers, 2014	
75.0	Number of responses
39.3	Average ITSx score for New Zealand
53.2	Best Industry Average: Heavy Industry
22.4	Lowest Industry Average: Wholesale / Retail / Logistics
80.0	Highest Organisation Score
11.6	Lowest Organisation Score
63.7	Highest Industry Index Score: Heavy Industry (Leader)
15.0	Lowest Industry Index Score: Metrics, Wholesale / Retail / Logistics (Laggard)
35.2	Average ITSx for organisations that have never thought about their ICT power bill and consumption
62.7	Average ITSx score for organisations that have responsibility for ICT power bills and consumption
27.5	Difference in the average ITSx score between those that have no idea about their ICT power consumption and those that measure and budget for it

One startling fact that cannot be overlooked is that in 2012 out of the eight countries surveyed, NZ was the global leader in the Government sector with an ITSx score of 60.0. Fast-forward 2 years we now see Government as one of the worst performing areas at 38.0. These results indicate a significant decline in Government focus on ICT Sustainability and an array of missed opportunities on the part of Government that would not only improve the environmental impact of ICT, but also contribute to significant savings in ICT energy costs.

Heavy Industry leads the way with an average score of 53.2, well above the national average of 39.3. As an industry Heavy Industry is characteristic of high energy use and related costs, as well as subject to consistent environmental compliance. It is therefore somewhat expected that this sector is highly attuned to both energy and environmental impacts and motivated to reduce these wherever possible.

Overall, there are a number of areas where the New Zealand ICT sector needs to lift its game and heighten its focus. These are highlighted in the following sections of the report and collectively provide a broad overview of the potential gains in sustainability that can be made.

New Zealand ITSx by Index Component 2014 vs 2012



Report Guide

This report consists of five key areas covered by ICT Sustainability being End User Computing, Equipment Lifecycle (Procurement and Disposal), Enterprise and Data Centre, Technology Enablement and Metrics. Under each section we have the New Zealand ICT Sustainability Index Score for that component, known as the ITSx, along with summary comments and trends. Also included are expert insights, focus areas and quick wins supported by industry commentary and examples. The objective of this report is not only to present the results of this survey but to also act as a practical guide for both the IT and Sustainability departments within organisations.

"The ICT Sustainability Benchmark report is so much more than a report, it's a great tool that allows organisations to fundamentally shift their approach to sustainable IT, for the better of their organisation and the planet."
Glen McLatchie – General Manager ICT, Meridian Energy Limited

End User Computing

Overall ITSx: 40.7

Overall Score Card: D

New Zealand Sector Leader: IT / Comms / Media

ITSx: 56.3 Score: C

End User Computing Year on Year ITSx Performance			
2011 ITSx	2012 ITSx	2014 ITSx	2014 Score Card
52.2	55.4	40.7	D

Summary and Trends

As yearly performance indicates, IT professionals have floundered when it comes to end user computing and there has been a dramatic decline in End User Computing (EUC) performance since 2012. These results are very disappointing particularly since our 2012 report highlighted that globally attention in this area was already waning. EUC is one of the easiest areas for organisations to implement quick wins and measure improvements, however the sector leader in this area only just passes with a score of 53.3 . Further, our research indicates that in some organisations End User Computing energy use now accounts for over 50% of ICT energy and emissions. As these results starkly indicate, a lot of work is required to bring EUC performance up to an acceptable standard. What is promising however is that there are some very easy, effective quick wins available – most of which also yield significant cost benefits. Therefore performance improvements should not be difficult to implement within organisations interested in bottom line improvements.

What is it?

End User Computing (EUC) refers to all personal computing activities workers use in their job and the impact these have on the environment. The use of desktop computers, laptops or mobile devices are all examples of EUC. EUC also takes into account printing practices and technology related consumables used in the workplace.

Quick Wins

- Remove Screen Savers
- Power down PC's when not in use
- Install power management software for accurate metrics
- Print to tablets to reduce paper consumption
- Use a power meter to measure actual versus claim power consumption. These cost as little as $20.
- Consider using softphones, thin client/virtual desktops or low watt PC's
- Use energy and performance rating standards such as energy star
- Ensure the IT department is accountable for energy usage and spend

"Virtual Desktop is an industry game changer. Not only can you use your assets longer and more efficiently, we are seeing over 80% savings in desktop energy consumption. For one large client this has the potential to save around $1M in energy costs over a three year period."
James Mercer – Solution Director, Fujitsu Australia New Zealand.

End User Computing

In Focus: Power Management

One simple area that can yield almost immediate return on investment (ROI) is power management. However a key issue our findings reveal is that IT managers have no incentive to improve EUC performance when they are not responsible for the organisation's power management budget. We refer to this as the split incentive problem: "Why should the IT department invest in power management when we don't pay the bill or reap the benefits?" Addressing this issue will see significant improvements in this area.

"In 2012 networked devices grew globally by two billion to reach a total of 12 billion and rapid growth is expected to continue". (Connecting with a Low Carbon Future, Telstra 2014)

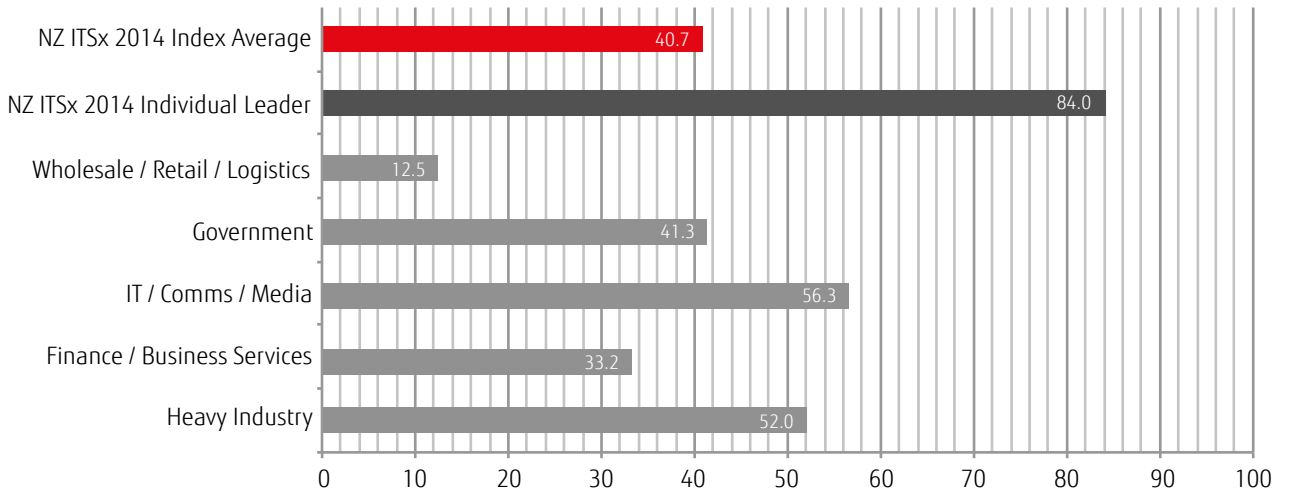
Expert's Opinion (Connection Research Insights)

Developing energy efficiency at the desktop is considered to be the 'low hanging fruit' for ICT Sustainability. Over the past 5 years of the 'Green ICT' debate, most corporations would have undertaken at least one technology refresh at the desktop. There has been significant opportunities for companies and Government agencies to fully resolve power utilisation for the End User, so it is disappointing to see this reduction in efforts.

The ideal solution would be to install power management software across all networked devices. There are many solutions to choose from, both international and local, and for the most part the cost savings will offset the technology costs. Yet, in the event that IT departments are reluctant to implement yet another project, irrespective of the positive outcomes, the standard desktop does come with a suitable set of tools to also help increase efficiency. This basic requirement involves liaising with the procurement department to acquire the most energy efficient devices, implement a recycling program, and then configure the company-wide Standard Operating Environment (SOE) to accommodate energy efficiencies. These measures alone would address 50% of the potential opportunities to enhance efficiency at very little cost.

The more advanced wave of technology solutions entails the implementation of desktop virtualisation architected to accommodate a "Bring Your Own Device" (BYOD) type solution. While there is still much debate being waged in the ICT world around which approaches are best for End User Computing, there is simply little justification for corporations to have reduced their efforts in this area. It is a surprising and disappointing result all round.

End User Computing ITSx by Industry Sector, 2014



Equipment Lifecycle Procurement and Disposal

Overall ITSx: 43.9

Overall Score Card: D

New Zealand Sector Leader: Heavy Industry

ITSx: 57.5 Score: C+

Lifecycle Year on Year ITSx Performance			
2011 ITSx	2012 ITSx	2014 ITSx	2014 Score Card
58.1	58.4	43.9	D

Summary and Trends

A decline of almost 15 points in this area is a major concern for New Zealand.

We believe this regression to be due to a combination of relaxed managerial attitudes around sustainability and organisations having the ability to outsource ICT procurement and disposal responsibilities to other third parties, such as recyclers and ICT asset management companies. At the time of this report the New Zealand Government is in discussions about implementing eWaste legislation; our advice to the Government is to implement that legislation sooner rather than later if possible.

"It is more a case of out of sight out of mind. By the time ICT assets reach end of life we are usually looking for the lowest cost option to dispose of the equipment and environmental considerations are not forefront of mind."
William Ehmcke - Director, Connection Research

What is it?

Lifecycle looks at how we procure, use and dispose of ICT assets. Using the right equipment, and utilising standards such as Energy Star and EPEAT (Electronic Product Environmental Assessment Tool) can achieve significant savings. eWaste is a major global environmental issue that can pollute our waterways and cause major intergenerational health issues. Lifecycle management is a key area that needs to be taken seriously if organisations are serious about enhancing their sustainability performance and reducing their environmental burden.

Quick Wins

- Implement a policy with rigorous environmental standards around procurement and management of ICT assets
- Ask vendors about their end-of-life take back policy and downstream processes to quickly eliminate disposal risk
- Utilise standards such as Energy Star, EPEAT and 80+
- In many cases a more efficient and environmentally sound option does not necessarily mean a price premium
- Conduct a Lifecycle Assessment on your ICT equipment, understand where it all comes from, what components are used and how is it disposed of. Ask questions of your vendors and recyclers

"For every new product launched, at least one more becomes unfashionable, unwanted or obsolete. Consequently, we're storing or discarding electrical and electronic products faster than ever. As more and more outdated electronic equipment ends up in landfill, the negative impacts of e-waste on the environment and humans will increase".
(NZ Ministry for the Environment)

Equipment Lifecycle Procurement and Disposal

In Focus: Exporting the Problem

In 2011 Australian broadcaster SBS exposed the issue of exporting Australian eWaste to Ghana. Described as "eWaste Hell" this piece of investigative journalism exposed the practices of exporting unprocessed eWaste disguised as repairs. Not only is this practice banned it also caused significant brand and reputational damage to Australian companies.

"For those clients who don't have an eWaste policy I simply show them the SBS video clip and ask one question. What would be the impact to your business if the eWaste found in places like Ghana had your asset register tag on it?"
Lee Stewart - Head of Sustainability, Fujitsu Australia and New Zealand

In Focus: What is EPEAT?

The Electronic Product Environmental Assessment Tool (EPEAT) is a comprehensive global environmental rating system that helps purchasers identify environmentally friendly and efficient computers and electronics. The tool takes into account several categories of environmental attributes when rating electronic products. These include:

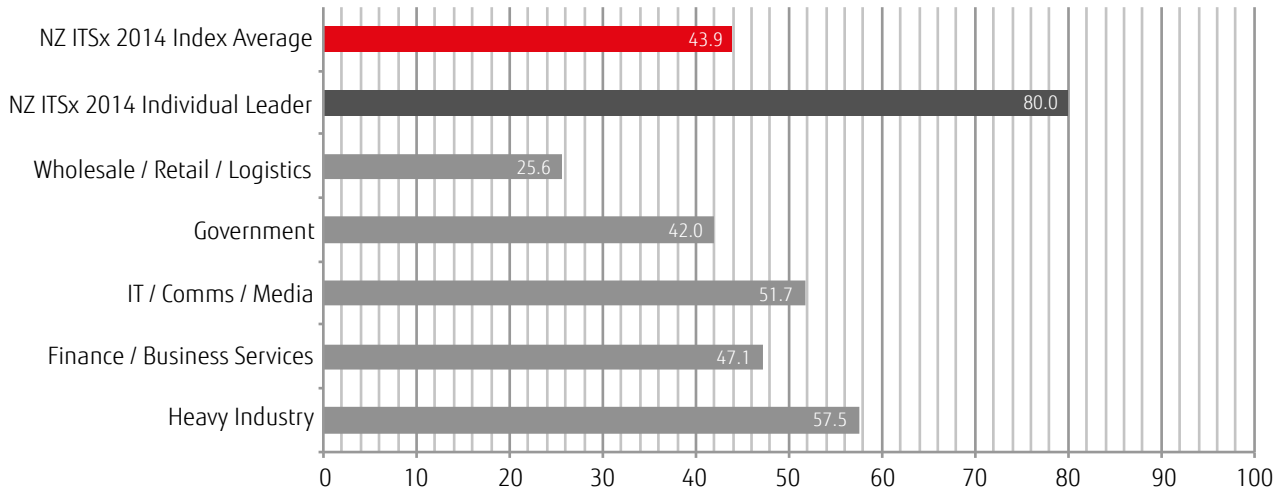
- Reduction or elimination of hazardous materials
- Material selection
- Design for end-of-life
- Product longevity/life extension
- Energy conservation
- End-of-life management
- Corporate performance
- Packaging

Expert's Opinion (Connection Research Insights)

Lifecycle management for ICT equipment simply makes good sense, and consists of three basic phases: Procurement, Disposal and Compliance. The vendor community has undertaken considerable efforts to improve their image and offer innovative services and products. The key aspect for Lifecycle initiatives is that they rarely require new budget, and almost always simply constitute the re-allocation of existing resources. Many companies are blind to the hidden asset value of old end of life computing assets, both hardware and software, through on-selling or refurbishing for new markets. The majority of the initiatives measured in the ICT Sustainability Index are based on management and behaviour. There has been a steady decline in the measures associated with the Lifecycle metric, at a time when the recycling industry has been developing and maturing. Therefore it is easy to conclude that the IT department may be failing from a lack of clear corporate direction rather than the removal of previous best practises.

"Over their lifetime, the 647 million EPEAT-registered electronics purchased globally since 2006, will deliver significant environmental benefits. Compared to products not meeting EPEAT criteria, these electronics will result in the reduction of more than 463,000 metric tons of hazardous waste, the elimination of enough mercury to fill 3.5 million fewer thermometers, and will reduce solid waste by the equivalent of 164,000 U.S. households' annual waste." (www.epeat.net)

Equipment Lifecycle ITSx by Industry Sector, 2014



Enterprise and Data Centre

Overall ITSx: 41.6

Overall Score Card: D

New Zealand Sector Leader: Heavy Industry

ITSx: 63.7 Score: B-

Enterprise Year on Year ITSx Performance			
2011 ITSx	2012 ITSx	2014 ITSx	2014 Score Card
55.1	50.1	41.6	D

Summary and Trends

The Enterprise and Data Centre sustainability performance has gone backwards during 2014. The below par scores in this area are disappointing considering the impact these operations have on the environment, and the efficiency gains in enterprise management are almost always coupled with lucrative financial paybacks through reduced energy costs. Leading in this space is Heavy Industry which may be due to the nature of the industry understanding the dollar values associated with efficiency and environmental gains. Needless to say there are strong areas for improvement across all sectors.

What is it?

The Enterprise index looks at the associated sustainability performance of Data Centre operations in addition to the broader hosting environment of ICT infrastructure, Networks, Software Architecture. This index also looks at organisations' adoption and readiness to outsourcing and cloud applications.

10 Data Centre Quick Wins

- Install light sensors in Data Halls – don't pay for lighting 24/7 when people are not there
- Install rack blanking panels and side brushes – improves rack airflow and takes only a few minutes to install
- Increase Data Hall temperature. Refer to ASHRAE standards for guidance, check equipment and importantly increase the temperature in small increments
- Use heat reflective paint on roofs
- Increase chiller flow and return temperatures. Usually set at 6/12 degrees (Celsius), these should be reviewed and can be raised to 10/15 degrees
- Use adjustable floor vents to improve cooling and air flows
- Repair and plug any leaks in Data Halls. Up to 25–30% more energy is wasted through "leaked cooling"*
- Install under-floor pressure control systems
- Implement Cold / Hot aisle containment
- Be more informed. Review educative guidelines such as Green Grid, EU Code of Conduct, and the Australian NABERS rating for Data Centres

*Data Centre talk, Daniel Prabhu, Mar 2012

Enterprise and Data Centre

In Focus: What is PUE?

Power usage effectiveness (PUE) is a measure of how efficiently a data centre uses energy. It is a contrast ratio between the total amount of energy used by the facility, to the energy delivered to computing equipment. The perfect PUE is 1.0. That implies all energy going into the data centre is used for the computing load and there is no need for cooling, lighting and power back up etc. A good PUE rating for organisations is about 1.6 which rates 4 stars on the National Australian Built Environment Rating System (NABERS) energy efficiency rating.

$$PUE = \frac{\text{Total Facility Energy}}{\text{IT Equipment Energy}}$$

Expert's Opinion (Connection Research Insights)

The data centre offers one of the greatest opportunities for improved energy efficiencies and has been the most widely researched and analysed aspect of ICT Sustainability. The challenge is one of 'turning the ship after it has left the dock'. The technology lifecycles in Data Centres are considerably longer than other aspects of ICT, and this is especially pertinent to the base building data centre environment. Replacing HVAC and cooling infrastructure into existing Data Centres is a substantial task at considerable expense.

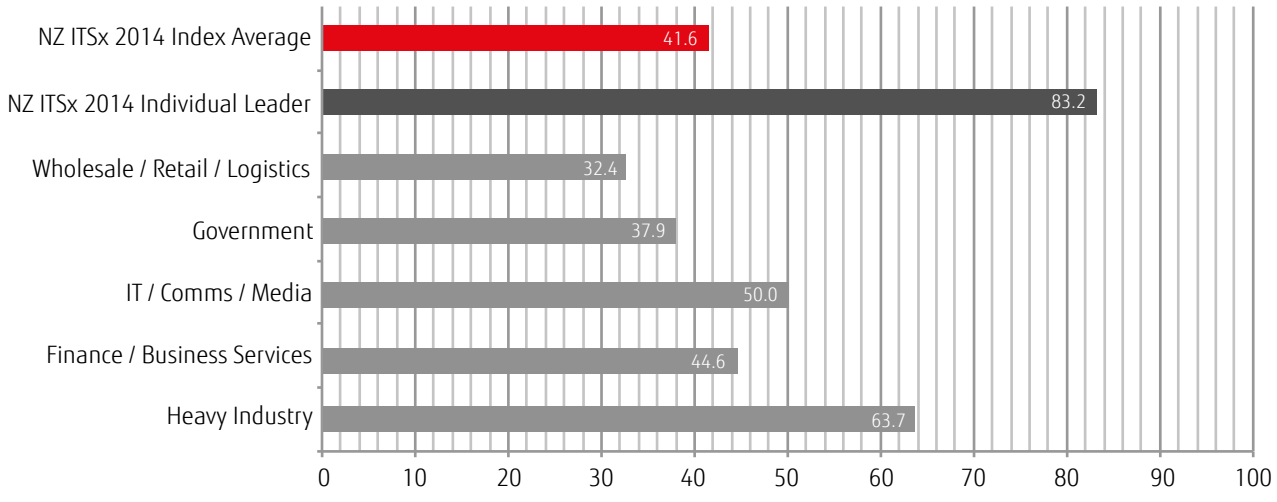
In parallel with the ICT Sustainability movement, there has been the massive growth in outsourced and newly built data centre facilities. Comparative to existing builds new facilities have a considerably better PUE as well as the ability to negotiate fixed PUE contracts. Enterprise ICT will continue to be a centre for energy efficiencies and much of the hard work can be easily outsourced.

In addition to the growth in third party facilities, major vendors in the data centre equipment sector now truly understand the energy efficiency paradigm shift, and have responded accordingly.

"72% of companies surveyed do not have a documented strategy for reducing energy use in the data center, although most agree that data center energy consumption is a real issue of concern." (Green Grid)

"In 2013 alone, nearly 3 million computer rooms in the US used enough electricity to power all of the households in New York City for two years. This is equivalent to the annual output of 34 large coal-fired power plants. If just half of the savings potential from adopting energy efficiency best practices were realized, America's data centers could slash their electricity consumption by as much as 40 percent. In 2014, this represents savings of $3.8 billion and 39 billion kilowatt-hours, equivalent to the annual electricity consumption of all the households in the state of Michigan." (Natural Resources Defence Council, 2014)

Enterprise and Data Centre ITSx by Industry Sector, 2014



Technology Enablement

Overall ITSx: 45.7

Overall Score Card: D

New Zealand Sector Leader: Heavy Industry

ITSx: 60.6 Score: C+

Technology Enablement Year on Year ITSx Performance			
2011 ITSx	2012 ITSx	2014 ITSx	2014 Score Card
52.4	51.7	45.7	D

Summary and Trends

Unfortunately Technology Enablement is another area that has trended backwards and which evidently suffers from a clear lack of focus. This is sadly a definite lost opportunity and concern given that this area is where the IT department can add significant value to the wider organisation, and easily facilitate quick wins in the sustainability space.

Heavy Industry scores marginally better than other sectors, nonetheless there is dramatic room for improvement for all organisations across all industry sectors to start leading the way in this space.

What is it?

Technology Enablement looks at the broader application of ICT across all business sectors and how organisations are harnessing the power of ICT to drive environmental improvements and sustainability gains. Due to the incessant growth and ever evolving comprehensive scope of ICT solutions, this is perhaps the more exciting index where ICT can have the biggest impact both for the organisation and society.

Technology Enablement is comprehensive in scope and looks at a wide range of areas including: Government and Compliance, Teleworking and Collaboration, Business Process Management and Applications.

Quick Wins

- Understand where the biggest environmental impacts are for your business and then concentrate your efforts on these areas
- For example with an airline it is jet fuel, agriculture might be water use and farming practices, and for a bank high impact areas could be building and operations, travel or even data centres
- Once you have established what the high impact areas and sustainability culprits are for your business, apply a technology and sustainable lens to these and ask yourself and your team "How can technology assist in reducing the environmental impact?"

"In Australia we've implemented a range of ICT based technologies that enable our operations to achieve the equivalent level of quality of productivity but at a fraction of the cost and environmental impact. For example by increasing the frequency of teleworking and using decentralised offices enabling staff to work in the outer suburbs avoiding unnecessary commutes into the CBD we've reduced carbon emissions by 2.8M tonnes and saved $1.7B annually in fuel ".
Telstra – Connecting with a Low Carbon Future

Technology Enablement

In Focus: Qantas Pilots using iPads

What may seem like a trivial behavioural change, last year Qantas pilots began using iPads in the cockpit instead of carrying 20kg of flight manuals. With the amount of flights made each year and the reduced weight of the manuals Qantas calculated that this form of Technology Enablement saves the company $1.5M a year in jet fuel.

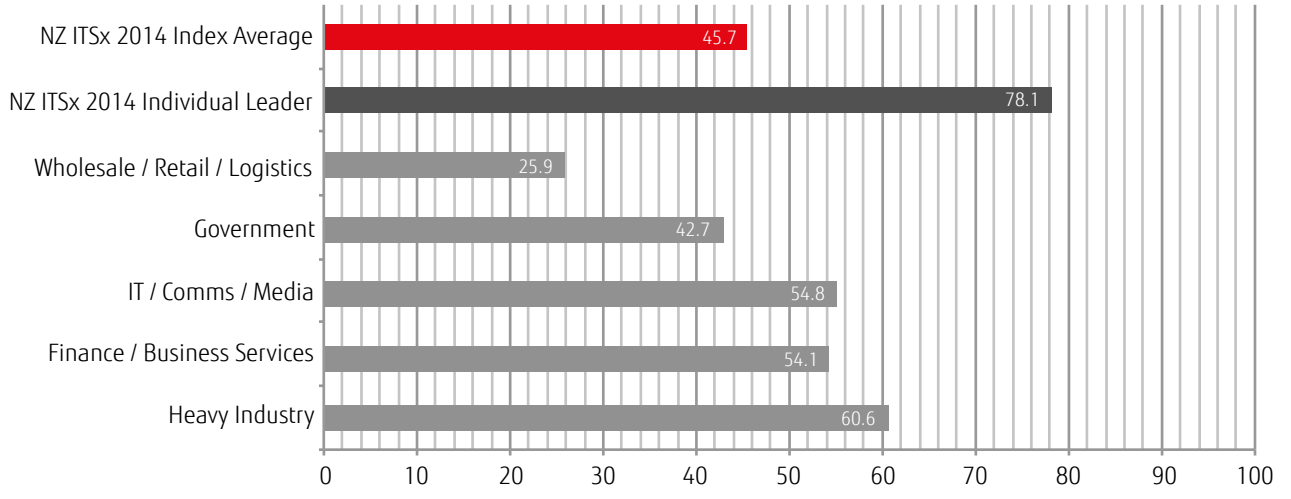
Expert's Opinion (Connection Research Insights)

Enablement is increasingly touted as the holy grail of ICT Sustainability. There have been countless studies into how ICT can be used for improved energy performance. Every aspect of a corporation's business processes is available for ICT renovation and improved energy performance.

The GeSI (Global eSustainability Initiative) report – Smarter 2020 presents a vision for a sustainable world through responsible ICT-enabled transformation and remains the most definitive and compelling study into the ICT Enablement opportunity. First conducted in 2009 the study concludes that ICT has a 7 to 1 improvement ratio in terms of its carbon reduction versus emitting potential. Whereby for every kilogram of CO2e emitted by ICT, ICT-enabled solutions have the potential to reduce total annual emissions by as much as 7 kilograms.

Technology enablement presents a true unique opportunity for the IT department. Rather than senior management seeing ICT as a cost centre, ICT has the ability to be part of the enablement equation and add significant value to the business.

Technology Enablement ITSx by Industry Sector, 2014



Metrics

Overall ITSx: 24.2

Overall Score Card: F

New Zealand Sector Leader: Heavy Industry

ITSx: 42.3 Score: D

Metrics Year on Year ITSx Performance			
2011 ITSx	2012 ITSx	2014 ITSx	2014 Score Card
41.8	38.6	24.2	F

Summary and Trends

Our results consistently show that organisations that have strong metrics perform better in terms of ICT Sustainability overall. A decline in 15 points and an overall rating of F in this area is therefore not only embarrassing but another huge concern for New Zealand. Given the high cost of energy in New Zealand there seems to be no logical reason driving this concerning complacent behaviour.

Metrics not only prove to yield sustainability improvements, but those firms that have metrics integrated into their operations also benefit from competitive cost savings. With this in mind there is only one direction for Kiwi firms to go in this space – up.

What is it?

The famous adage coined by Peter Drucker "What gets measured gets managed" is certainly no understatement in today's world when we talk about performance and efficiency improvements across business. Metrics is one of the most important aspects of understanding your organisation's ICT Sustainability. You simply can't improve what you don't measure. Metrics includes the very important practice of monitoring, measuring and managing the cost and consumption of ICT energy. Consistently our results clearly indicate that those organisations that have strong performance in metrics perform better in terms of ICT Sustainability overall.

Do you know your ICT Energy?

A key question asked in the survey, and one that in the past has been important to organisations' overall ICT Sustainability performance, has been IT departments' understanding and ownership of the ICT energy bill.

In 2011 only 4% of New Zealand CIO's were totally responsible for ICT's power consumption. This remained unchanged in 2012. While today this figure has risen to 20% we have unfortunately seen a decline of 14 points in this area. What is interesting to note is that this one key survey question pertaining to visibility of the ICT power bill is directly linked to an organisation's overall ITSx performance. Where IT departments are responsible for their ICT energy use there is a 27.5 point improvement gap between those that have no visibility at all. In short a simple way to improve ICT Sustainability is for your IT team to know its power bill every month.

Visibility of ICT Power Bill, 2014		
Category	% Respondents	ITSx
We never thought about it We never see our power bill. ICT power consumption is not measured separately and we hav no idea how much we consume	68%	35.2
We never see our power bill, but we are told how much we consume We get a separate power bill for ICT, but it is not part of the IT budget	12%	42.6
We get a separate power bill for ICT, and it is part of the IT budget We are totally responsible for the power consumption of the ICT function	20%	62.7

Metrics

Quick Wins

- Know your ICT energy use – the simple calculation shown below will help you establish this
- Work out ICT energy use per employee
- Use a power meter to test actual vs claimed power consumption – especially useful in the evaluation phase of buying new equipment
- Have a separate ICT Sustainability or Green IT budget
- Ensure IT managers are accountable and cognisant of energy consumption in the business
- Create environmental benchmarks for your company and specifically the IT department - measure these on a monthly basis

"If you only remember one thing from this report it is to know your ICT energy. Treat it like cash in your business, measure it, monitor it and control it. This one thing alone will drive efficiencies across other areas of not just ICT but also your whole organisation."
Lee Stewart - Head of Sustainability, Fujitsu Australia and New Zealand

Best Practice Beyond Quick Wins

- Take full ownership of your ICT energy budget - negotiate a deal with your CFO where you accurately measure your ICT energy baseline, start a full efficiency program and reinvest savings.
- Delegate an Officer or Manager Responsible for ICT Sustainability
- Set ICT Sustainability KPI's and Strategy
- Install ICT Energy Monitoring Software across all assets including the Data Centre
- Establish an acceptable sustainable performance policy. Where do you see your goals in two to five years? What steps do you need to take to get there? Measurable goals are the only way to measure progress

Expert's Opinion (Connection Research Insights)

The lack of the collection of good metrics for ICT Sustainability continues to limit progress across all industry sectors. The reason for the lack of attention to detail is closely aligned with fiscal responsibility for energy costs. Unless the CIO is given a specific budget for electricity cost and consumption there will always be a limited justification for firms to measure and manage the resource better. This point is as true today as it was 5 years ago.

The probable cause for a lack of metrics is likely attributable to the lack of clearly articulated corporate directions. The ICT agenda has maintained a full 'dance card' for many years, with key issues around security, the web and evolving business requirements. These issues have typically superseded the importance of prioritising sustainability monitoring. But every new technology implementation is an opportunity for improved sustainability. Those companies which looked to measure the inputs to ICT 5 years ago are today's leaders within the ICT Sustainability sector.

While there is ample supply of readily available information on the subject of metrics and methods to collect data, there has been limited investment in data interpretation for sustainability and the benefits this data brings organisations. Therefore data is seen to be of limited usefulness. The immediate requirement to improve ICT sustainability outcomes is to invest in analysis skills that transform raw data into compelling business opportunities. Most ICT products today offer some level of data access and collection componentry. Further, most hardware will report on energy consumption, along with a range of other statistics, all of which are useful for monitoring and improving performance management.

Knowing the benefits metrics bring, the CIO of tomorrow will require a greater level of analytical skills with ICT to manage and monitor a broad portfolio of technologies. Energy management can simply be another index across a new set of metrics required to maintain a diaspora of technology services. Integrating energy into the ICT budget and making IT managers accountable for their energy consumption would be a fruitful and winning starting point.

Metrics

In Focus: How to measure ICT energy use

There are a number of ways to tackle measuring ICT energy use and a number of tools available to help get the ball rolling. Simple desktop analysis programs are available that provide you with a very high level outlook of what your approximate ICT consumption is. Using a simple power meter can give you a more accurate measure of individual assets. This data is beneficial since it can then be extrapolated across the total number of assets giving you a more accurate gauge of the entirety of your organisations power consumption.

$\sum_{Asset\ Types}$ (Number of Assets X Energy Rating (Watts) X Power Utilisation (%) X Annual in Use (Hrs)

Practical Scenario: Using the above formula and based on 2,000 laptops in your organisation.

You have installed a meter on numerous laptops. The average power draw is noted at 80 Watts. You estimate that the laptops are on for a period of 8 hours per day and also used after hours so we can estimate that each laptop is in use a total of 2,500 hours per year with an average power utilisation of 65%. You speak to facilities to establish your average energy price. They tell you the price is $0.25 per kWh.

Annual energy consumption per laptop: 130 kWh (80 watts X 65%) X (2,500 hours / 1000)

Annual cost per laptop is: (130 x 0.25c) = $32.50

Applied across 2,000 devices: $65,000

Repeat this formula for each asset type – printers, desktops, servers etc.

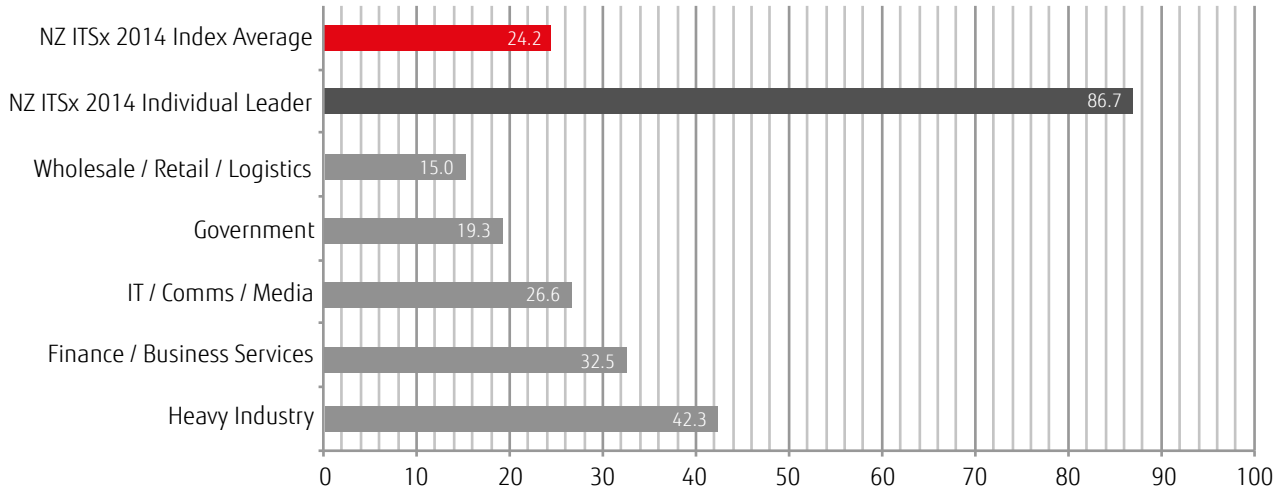
Servers and printers usually run 24/7, so perform the simple calculation using a total of 8,760 hours (which is all the hours in a year). You can also add the cooling load costs to servers if you know the PUE (Power Usage Effectiveness).

For example, you determine that a server costs you $1,000 a year in power and is hosted in a data centre that has a PUE of 1.9. Actual power costs would be Server Costs x PUE, which equates to $1,900 per year ($1,000 X PUE 1.9). Your hosting provider may not be charging you for your power directly but you are most likely paying for it in your hosting fees.

FTE consumption: Once you have your total ICT energy use, another good measurement is dividing that figure by the number of full-time employees (FTE). ICT energy use per FTE is a good intensity measure and one you can benchmark for future reference.

Note: This formula is not 100% accurate since it is almost impossible to determine the period of idle time and sleep etcetera. However undertaking this exercise across your ICT asset base is an interesting exercise. You will be able to identify where the energy hogs are in your business, make more informed decisions about refresh cycles, assist in building ICT energy efficiency business cases and whether you should invest in power management software tools.

Metrics ITSx by Industry Sector, 2014



Concluding Remarks

As this year's report finds, efforts to improve ICT Sustainability across New Zealand organisations have been disappointing to say the least. The NZ ICT Sustainability Index (ITSx) declined dramatically from 50.8 in 2012 to 39.8 in 2014.

What is perhaps the more concerning aspect of these findings is that not only has New Zealand ICT Sustainability performance plateaued, it has in fact undergone a marked decline since the Index was established.

This does not bode well for industry given the increasing importance and need for sustainable business practices globally in an increasingly resource constrained world. It is also highly surprising given the significant cost benefits associated with adopting more efficient practices and ICT's technology enablement potential to help drive sustainable solutions and practices across a breadth of areas and industry sectors.

There are clear opportunities for enhancing the use of ICT to improve efficiency and significantly reduce costs. However most New Zealand organisations, with the exception of a few sustainability champions, appear to have lost sight of these. New Zealand firms must now adopt the mindset that implementing sustainable ICT practices is not an expensive cost centre to business but an attractive and easily achieved investment opportunity.

Imperatively organisations should be proactively tracking the energy use associated with their ICT resources through metrics. By having systems in place to access and track real-time data about ICT energy costs and consumption, organisations can evaluate, select, and prioritise more efficient and competitive ICT practices. Further, by focusing more effort on Technology Enablement and its capacity to drive wholesale improvement across a breadth of practices, IT departments can add significant value to the wider organisation. But it is not all bad news. The measures required to take that yield big benefits are easy and can be as straightforward as assigning IT department accountability for energy spend, making simple modifications to data centres or integrating sustainability criteria into procurement policy.

As such, while this report serves as both a strong wakeup call to the New Zealand ICT sector, urging all organisations to up their game in the sustainability arena, it also intends to be a source of inspiration for the potential that lies ahead should businesses sit up and take note. Improving ICT Sustainability is a smart business decision and one that achieves both lucrative environmental and financial goals.

About this Research

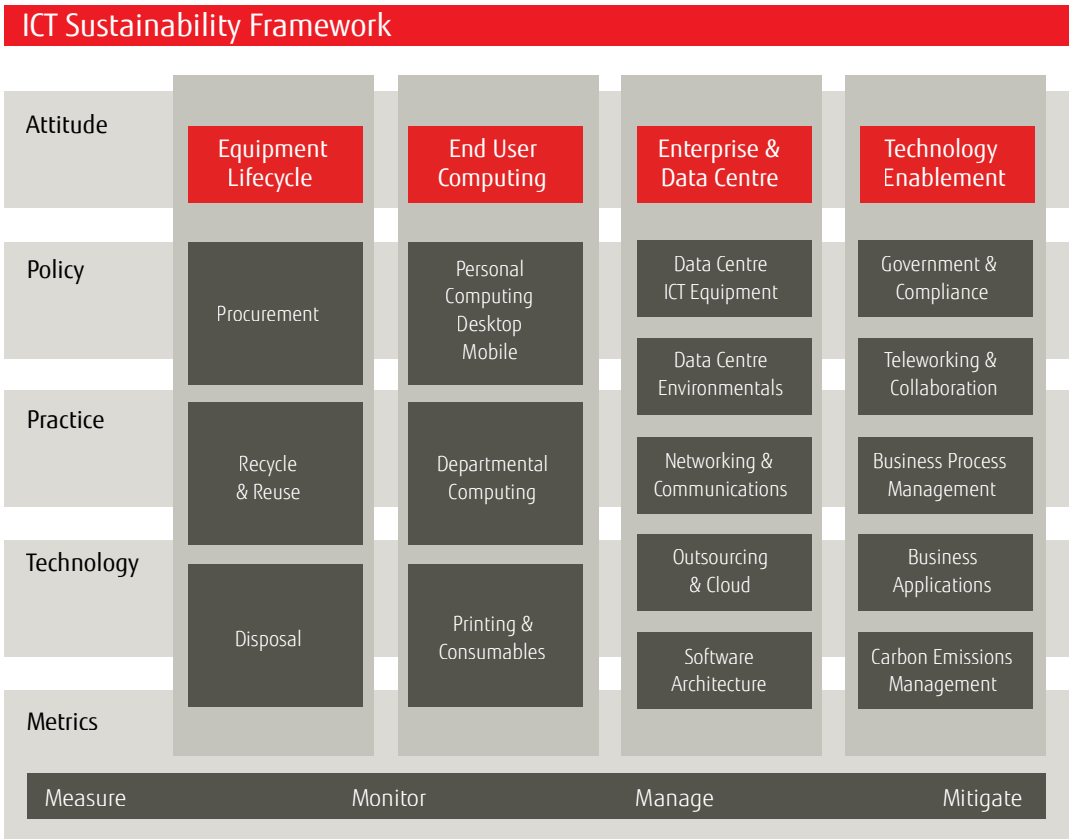
Our Research Methodology – The ICT Sustainability Framework

The ICT Sustainability Benchmark uses a methodology developed by Connection Research and RMIT University (Melbourne Australia). The results of our research have been used in the development of a standardised ICT Sustainability Index for ICT-using organisations. The index is designed to have application across any industry vertical or country. 5 individual indices spanning key areas of ICT operations have been used to calculate ICT sustainability performance. These include:

- Equipment Lifecycle Procurement and Disposal
- End User Computing
- Enterprise and Data Centre
- Technology Enablement
- Metrics

Across each of the 5 indices the ICT framework also takes into consideration additional influencing factors in determining the ICT index rating. These include attitude, policy, practice and technology, as outlined in the figure below.

Having defined the key areas of ICT Sustainability it is then possible to measure each individual component. This is achieved by using the Capability Maturity Model (CMM). The concept of the CMM is often used in the ICT industry to describe the level of implementation of various systems and is a standardised way of qualifying the maturity of a business process. The levels range from 0 (no action at all) to 5 (optimised, or best practice). The CMM enables the development of a consistent framework from which organisations are able to measure and benchmark their sustainability performance.



Factors used to determine the ICT index sustainability rating

The Research Process

A total of 75 responses were collected through online surveys and interviews between March and July 2014. Respondents were asked over 100 questions about their ICT Sustainability policies, behaviour, and technologies in each of the five key areas of ICT Sustainability. A breakdown of respondents by industry sector is outlined in the table below.

Respondents by Industry Sector, 2014

New Zealand Industry Sector	% Respondents
Finance / Business Services	28%
Government	38%
Heavy Industry	10%
IT / Comms / Media	15%
Wholesale / Retail / Logistics	10%

The responses were weighted to deliver a score (out of 100) for each of the ICT Sustainability ndex components (attitude, policy, practice, technology, and metrics). These were then combined to determine the overall ICT Sustainability Index for each organisation, ensuring comparisons could be made between respondents.

Research History

This research has been conducted in 2010, 2011 and 2012. In 2012 we went out to 1,200 CIOs across eight countries including New Zealand. To date we have collected survey data from over 3,000 CIO's and with our partners Connection Research have been able to provide valuable and credible data to the ICT community. This is the first dedicated country specific report.

References & Resources

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Global e-Sustainability Initiative – Smarter 2020: http://gesi.org/SMARTer2020
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Sustainable Business Council

wbcsd New Zealand partner to the world business council for sustainable development

About New Zealand Sustainable Business Council

The SBC is a CEO-led group of companies that catalyses the New Zealand business community to play a leading role in creating a sustainable future for business, society and the environment. See www.sbc.org.nz.

cr connection research

About Connection Research

Connection Research is a market research and consulting company specialising in the analysis of sustainability issues. Services are provided in consumer and community sustainability, ICT Sustainability, building industry and trades, and carbon compliance.

About Fujitsu New Zealand

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