



The Environmental Impact Nursery™

BLUEPRINT V1

Edition 2

Foreword

Let's be clear - natural capital¹ (the environment) underpins the four other key forms of capital,² and is, therefore, the basis for all ecological, economic and social activity on earth. Without sustainable natural capital, we can't have a sustainable planet or economy. Without sustainable natural capital, we have no long-term future.

The biggest risk we face is that small changes can trigger significant eventual change, best described as the butterfly effect.³ These small changes are amplified by positive feedback loops,⁴ which means exceeding planetary boundaries⁵ and reaching tipping points⁶ faster. Once all tipping points have been reached, ecological collapse⁷ and mass extinction are inevitable.

We have clearly crossed several boundaries already.⁸

Financially, we've loaded up the natural capital balance sheet with significant debt, and the environment is almost bankrupt.⁹ Our only choice is to restructure because liquidation is not an option.

Socially, we need to stabilize the planet to give ourselves time to evolve into a fair and just society.

Globally, we must take action, fast, in concert and with purpose. We must also think bigger, broader and more differently than ever before. We need solutions, but crucially, we need the right solutions.

The main tools that we have to drive action are the political and capitalist systems. There is nothing wrong with either, as ordered systems. The values and ethos that drive them is what let humanity (and the planet) down. There is now no time to change the tools, so we must use them differently.

The initial response, to the COVID-19 virus, from governments around the world, gave us some understanding on how to achieve a global goal. The varied outcomes demonstrate that to be successful, we need to take action using a well-defined plan based in science and innovation, but also based on the common good and a keen focus on the future. The best outcomes combined quantitative and qualitative based actions.

There are many across the globe doing great work towards global sustainability, based on excellent but single agendas. Nature is deeply interconnected and so must the solutions be.

Ultimately, we must all come together and sing from the same hymn sheet. Then we can create a global sustainability anthem based on a melody of interconnected achievement rather than the current cacophony of effort.



Founder & CEO
Natural Impact Group Pty Ltd

IMPORTANT INFORMATION

This Blueprint is dated **5 August 2020** and is **Edition 2 of Version 1**
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This document is only the outline of the model it's based on.

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Introduction

This blueprint is the culmination of eight years of research into the issues around global sustainability and my desire to create a potential solution. Simultaneously, I took action and built a suite of start-up companies to hold emerging environmental, market-based, solutions and demonstrate proof of concept. My modus operandi is based on my long-held belief that life is a path that you beat in the walking.

I've always had an entrepreneur's passion for understanding what made the best companies and am bringing that passion into this blueprint. That's not to say it's complete and I look forward to the continued stream of improvements as I forge ahead.

Based on scientific findings and in-depth research, this work is about reviewing, understanding and documenting what I've learnt in taking action, so we can apply it across the spectrum of planetary boundaries and continue our evolution. It's a stepping stone in the path I am walking.

Capitalism got us into this dire situation, along with the wrong land ethic¹⁰ and cultural thinking best described in *The Tragedy of the Commons*.¹¹ As Gus Speth famously said, "The top environmental problems are greed, selfishness and apathy..."¹²

Innovation and exponential growth over the last 250 years have helped drive us into the ditch we now find ourselves in. However, as I hope to demonstrate within, the right innovation and growth are fundamental tools we need to give ourselves time to stabilise the planet and restructure our culture. This sounds contradictory, I know, but it depends on the approach. While we need to do things differently, we must be careful not to throw the baby out with the bathwater.

Yes, "the house is on fire" and "we must act now"! We constantly hear these cries and agree with them, yet we continue along the same path. Fortunately, there is hope that change is coming. As Paul Gilding lays out in his recent paper on climate change,¹³ technology is largely available, climate change is now obvious and accelerating, public engagement and political momentum are rapidly turning, and the financial markets are primed. It's a start, but climate is only one of nine planetary boundaries.

To put that "change" into perspective, in 2014, the United Nations reported that we would need to spend US\$75 to US\$105 trillion from 2015 to 2030 to achieve global sustainability.¹⁴ That's a lot of money in 15 years. Not enough action means we haven't met budget, and we're already a third of the way in. Once the deadline, cost and planetary boundaries reality kicks in, the next step could be panicked investment and implementing new technologies that could make matters worse. This would be disastrous.

To mobilise this much impact capital effectively institutional investors must be involved, but they're currently restricted by mandates and deal size. To address this, we need an objective, quantitative model, focused at the industry scale. It also needs qualitative aspects to avoid greenwashing,¹⁵ mission drift¹⁶ and to simplify impact measurement. Hopefully, then governments will come to the party with supportive policies and legislation that drive home the goal of global sustainability.

What has happened in the last 15 years or so is great, but the reality is renewables,¹⁷ the circular economy¹⁸ and responsible investing¹⁹ are not going to get us there in time. We need to think bigger, broader and more differently than ever before. One approach is to expand on our successes. For example, the cap and trade carbon market is now a liquid, US\$1 billion per day market,²⁰ which provides benefits at a rate of 5 to 1²¹ and drives innovation to lower emissions.

We should continue to build on successes like this, but, as great as these are, it's still not enough. We need to do much more than expand on the successes, we also need to take action toward breaking new ground too, and fast! That's where this blueprint comes in.

This blueprint is not about mature or known solutions - it's about creative problem-solving, delivering the right emerging solutions, and deep impact. It's about bringing together institutional capital and environmental impact investing at the scale needed to deliver a sustainable planet. It's about giving us time to create a fair and just society for all life.

Eight years ago, the seed of an idea was planted, which became a 10-year plan and eventually a company called Natural Impact Group Pty Ltd. This company is the world's first Environmental Impact Nursery™ which houses five subsidiaries, each the steward of a unique environmental solution. Our most advanced environmental, market-based, solutions include a model to generate revenue from the world's stranded fossil fuel assets and the world's largest holistic river remediation project. We also have a suite of third horizon projects coming online within five years.

As I lay out the construct that is The Environmental Impact Nursery™ (TEIN), I will continue working on providing the final elements for success with Natural Impact Group Pty Ltd. This will be a proof of concept that demonstrates how, as a society, we can become the true stewards of nature that we need to survive and prosper, while, paradoxically, delivering investment alpha. I will also continue to update this blueprint as a tool to help deliver global sustainability and, more importantly, our moral obligations to each other. The obligations so well laid out in the United Nations 17 Sustainable Development Goals,²² the Paris Agreement,²³ the Aichi Biodiversity Targets²⁴ and others.

This blueprint also comes with an invitation for those wanting to participate in its development going forward. Globally, some brilliant people are working on various solutions- the thought leaders, chairs, CEOs, investors, philanthropists, scientists, innovators, entrepreneurs, youth, politicians, bureaucrats, dreamers, doers, and everyone in between. We need to collaborate, champion the doers and lift each other up in whatever way we can. If you see a hole in a potential solution, don't dismiss it, first, try to help make it better.

This blueprint lays out the actions needed to solve the natural capital emergency and the right values and ethos needed to implement them. It's aimed at the current actors, those that aspire to take action and all those that aspire to back them. It includes a plan to bring them all together to create a global sustainability anthem.

By finally taking on this responsibility, we reinforce our right to live on a healthy planet and have a just and fair society. Commitment to this one action is the single step required to move away from the greed, selfishness and apathy that has caused this planetary-scale dilemma.

I introduce my blueprint and trust it provides the impetus for you to act or to build on the actions you're already taking.



The World's first Environmental Impact Nursery™

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Corporate

The following text presents the structure of The Environmental Impact Nursery™ (TEIN) which is driven by the TEIN Capital Allocation Model™ (TEIN CAM) and underpinned by its ethos, and impact measurement metrics.

The Environmental Impact Nursery™ (TEIN)

The Environmental Impact Nursery™ is a business-for-purpose, regenerative capital model for implementing a goal-orientated and mandate-driven methodology to deliver the right solutions as qualified deal flow for institutional investors. This ultimately allows institutional investors to better engage in impact investing and mobilise its vast capital base via the appropriate deal size and themes. It's underpinned by an ethos that combines the lessons from the most respected and successful companies with humanities greatest philosophers and teachers.

The TEIN structure (Figure 1) is similar to an innovations lab and is made up of four parts (H1, H2, H3 and Foundation) within a corporate group structure. Most importantly, each part is driven by the strict TEIN CAM mandate of six Investment Themes, three Selection Criteria and the Critical Litmus Test. Its ethos is the critical aspect required to move away from business-as-usual in capitalism.

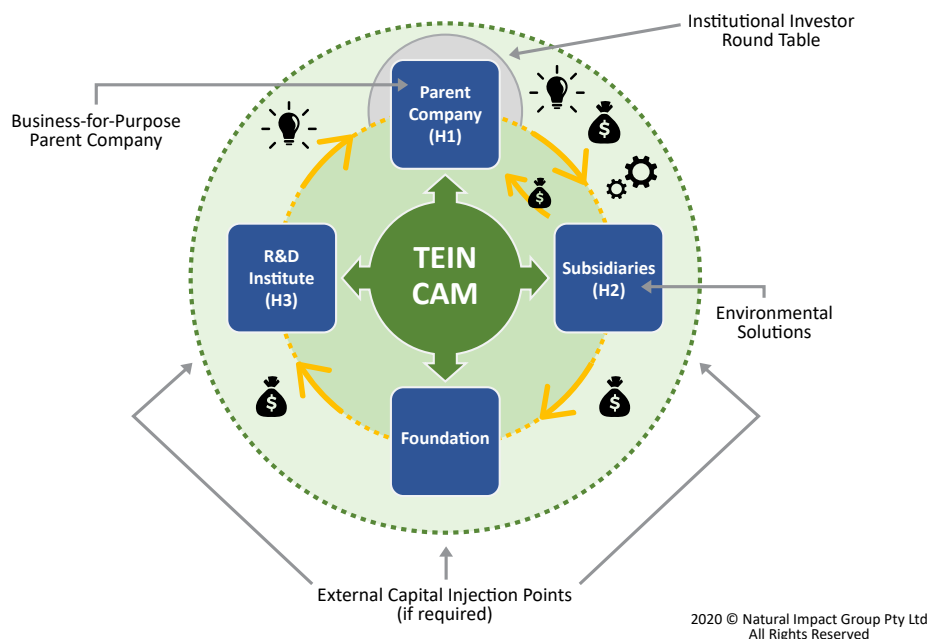


Figure 1- The Environmental Impact Nursery™ structure

H1, H2 and H3 are described in the Three Horizons for Growth (see below), but can be understood as:

- The core businesses of the parent company (H1) within a dedicated business-for-purpose business model;
- Each environmental solution (H2) is initially housed in a wholly-owned subsidiary;
- An in-house R&D Institute (H3) is established, with DGR status, to deliver the right solutions according to the TEIN CAM mandate.

The Institutional Investor Round Table sits beside the parent company and provides basic oversight to ensure solutions fit within mandates. It allows better engagement with institutional capital and minimises due diligence time and cost.

Establishing a foundation, tax-effectively drives profit into research and development (R&D). This R&D is done through the in-house R&D Institute and, where necessary in partnership with universities and other research organisations both nationally and internationally. A specialised grant structure, similar to the model employed by The Grantham Foundation for the Protection of the Environment, enables the parent company to claw back interest in ideation and new technology where funding is provided to external organisations.

The structure of The Environmental Impact Nursery™ (TEIN) provides a perpetually growing, tax-effective, regenerative capital model where external capital can come in through any subsidiary, the foundation and/or the R&D Institute if required.

This structure sets out a clear and objective investment methodology which addresses the following concerns of impact investors - the understanding of funding gaps and related opportunities, impact measurement and evaluation, co-investment opportunities and collaboration, finding good organisations to support, funding innovative solutions, scaling successful projects and businesses mission creep¹⁶ and greenwashing.¹⁵

The TEIN structure, underpinned by the TEIN CAM, makes impact measurement much simpler too (see Impact Measurement below).

Driving Innovation

A critical part of the TEIN is how investment is driven into the right environmental solutions. Innovation got us in this mess, but it was innovation driven by monetary gain based on consumerism and the venture development model.

Let's first assess business-as-usual for sustainability/environment-based venture development. The current venture development model is an ad-hoc process where innovators and investors come together under various investment mandates. It's based on an investment mandate approach (making money) meaning investors must wait until the "right" investment turns up before mobilising their capital. This process of funding any investment that can generate a financial return means a shotgun approach to solving environmental problems. When the seemingly right investment is presented and combined with the current venture development model, the lag in development, implementation and mainstreaming, solutions take too long and it's time we don't have. Rarely thought is given to other impacts (negative or positive) an investment might have on various planetary boundaries.

The TEIN value proposition (Figure 2) is based on rethinking the venture development model process between innovators and investors (green) to drive the right innovation from ideation to the institutional investor stage (yellow).

Investment returns need to be a significant part of the solution. However, solutions-based approach (setting goals and achieving them) is a better path to global sustainability.

We need to set the right goals for developing the right innovation (defined by the TEIN CAM), but we need to go all in to achieve them too, like a "moonshot".²⁵

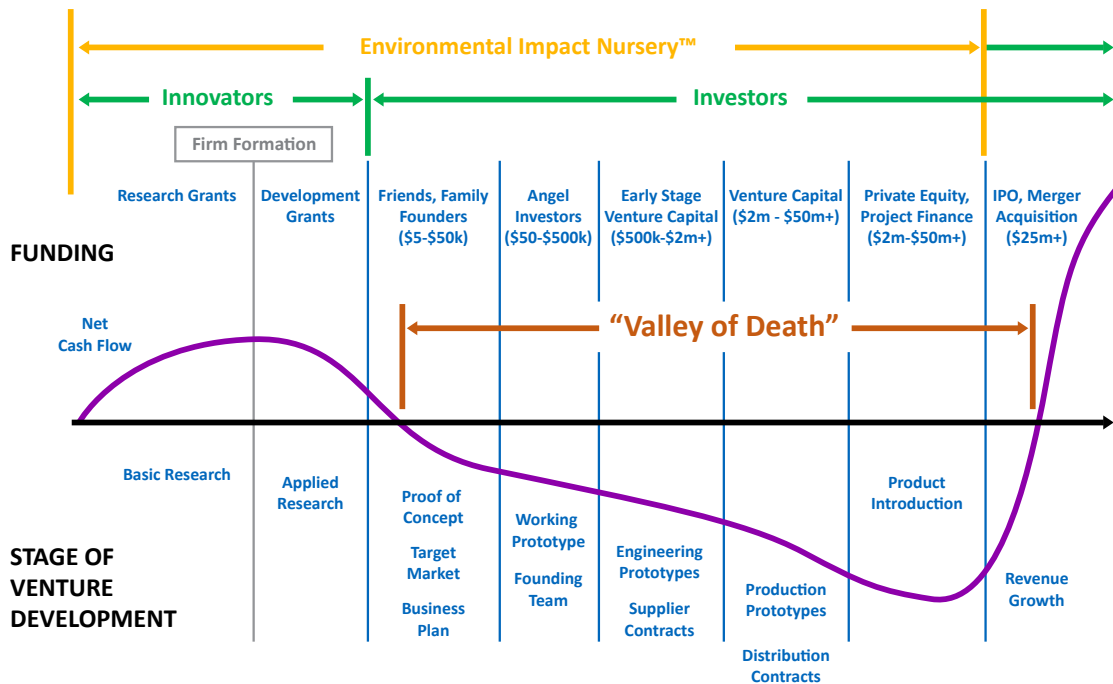


Figure 2- The TEIN value proposition: rethinking the venture development model to drive innovation up to the institutional investor stage. Adopted from the UC Davis Centre for Entrepreneurship

Creative Problem Solving

Creative Problem Solving (CPS) is a proven method for solving problems and identifying opportunities in imaginative and innovative ways. By adding creativity to knowledge and thinking, it encourages us to find fresh perspectives and develop innovative solutions so that we can formulate plans that overcome obstacles and achieve our goals.

Valuing the humanities disciplines as much as we do STEM disciplines is a key component to building successful teams of innovative problem-solvers. According to Eric Berridge,²⁶ this mixture of STEM and the humanities has the capacity to bring creativity and insight to technical problems.

CPS has been used with great effect by people like Aristotle, Archimedes, Darwin, Bell, Edison, Einstein, Mozart, Gandhi, da Vinci, Hawking, Galileo, Tesla, Kepler, Jobs, Gates, Musk and others.

These high-profile users of CPS spent their lives doing so and gained widespread attention because of the global implication of their solutions, but anyone can use CPS to great effect. For example, the small business service that benefits its community used CPS at some stage in its development; the entrepreneur that developed a new app to address an issue used CPS; the farmer that fixed the broken implement by holding it together with fencing wire because that was all that was available in a remote location, used CPS.

With large complex problems, it can take time for CPS solutions to evolve. In some instances, it can even take years. While the Three Horizons for Growth model (see below) is capable of allowing time for these solutions to evolve, other processes may not be. This point is critical as, of the five key factors to generating success in new start-up ventures, timing is rated the most important at 42%.²⁷

The Three Horizons for Growth

The Three Horizons for Growth construct is described in the book *The Alchemy of Growth*²⁸ and the principals are summarised on the McKinsey website.²⁹

To achieve consistent levels of growth throughout their corporate lifetimes, companies must attend to existing businesses while still considering areas they can grow in the future. The Three Horizons construct provides a structure for companies to assess potential opportunities for growth without neglecting performance in the present.

The theory that underpins the Three Horizon construct emerged from two different strands of thought while researching what propels good growth companies:^{28,29}

1. the assessment of the life of a business. In the beginning, there is a lot of investment and very little progress, then there's a period of accelerated growth. At the top, growth slows down or declines as innovation gives way to inertia.
2. companies that have been growing for a long time were reinvigorating their portfolios through a weed, feed and seed type program.

Figure 3 illustrates how the Three Horizons arcs combine over time to grow profit.

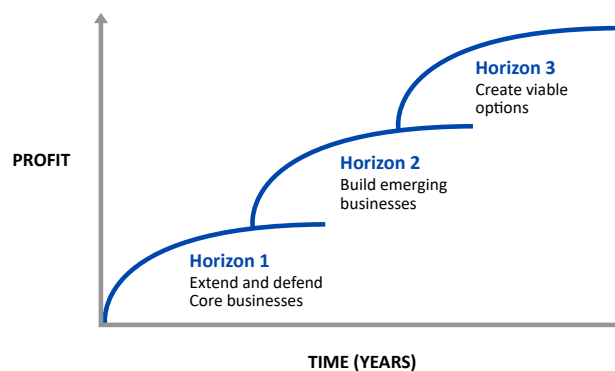


Figure 3- The Three Horizons for Growth. Source: McKinsey & Company

Horizon 1 (H1) represents those core businesses that provide the greatest profits and cash flow. Here, the focus is on improving performance to maximize the remaining value.

Horizon 2 (H2) encompasses emerging opportunities, including rising entrepreneurial ventures likely to generate substantial profits in the future, but require considerable investment to do so.

Horizon 3 (H3) contains ideas for profitable future growth. For instance, small ventures, research projects, pilot programs, or minority stakes in new businesses.

All three horizons need to be managed concurrently and with equal attention from the CEO, rather than the CEO focussing their effort on H1 because that's the core business and cash generator and putting a little effort into H3 because that's where the future long-term growth prospects are found. There must be an acknowledgement that it takes a different type of leadership or organisational structure to make it work as the performance metrics and organisational style are different for H1, H2 and H3. Successful companies cluster H3 projects around common themes and move them as quickly as possible into H2 where they can demand increased funding and resources.

The y-axis is value creation (or profit)

The source of value creation in H1 is superior execution. These are businesses that are run better by the parent organisation than anyone else and extend their life by continuing to innovate within each core business unit.

The source of value creation in H2 is a positional advantage. These are businesses taking advantage of a new opportunity to gain a stronger position relative to competitors. Much of the parent company's value is derived from relatively small businesses in H2 because the market gives the parent a much higher PE ratio³⁰ due to the prospective performance of H2 businesses.

The source of value creation in H3 is insight and foresight. These are businesses that the parent company believes will have potential for whatever reason. Those that are successful at H3 cluster projects around 2-6 themes (depending on the size of the parent) and give them time to gain traction. This is in contrast to a venture capital/shotgun approach where most are expected to fall over, a few are expected to break even (or be slightly positive), and one or two are expected to be major winners.

The sources of value creation across H1, H2 and H3 are different, which reinforces the need for them to be managed differently.

The metrics, people and capabilities

As illustrated in Figure 4, the metrics, people and capabilities are different across the Three Horizons.

H1 needs a strong performance focus, with metrics being profit, return on invested capital and cash flow. This needs experienced business managers who use traditional financial planning and control processes.

H2 is a much more entrepreneurial business environment with metrics based on revenue and NPV.³¹ This needs entrepreneurial business builders who have a flexible budgets process (within solid parent company commitments) and use milestones.

H3 is trying to create privileged positions in new emerging fields/technologies/opportunities and needs to be championed by visionary senior leadership. Metrics are milestone-based and market-oriented looking for commercial rather than technological progress with processes related to pushing the vision by leadership.

	Horizon 1	Horizon 2	Horizon 3
METRICS	Return on invested capital (ROIC)	Net present value (NPV)	Options value
PEOPLE	Business maintainers	Business builders	Champions and visionaries
CAPABILITIES	Fully assembled capability platform	Capabilities being acquired or developed	Capability requirements may be unclear

Figure 4 - The Three Horizons metrics, people and capabilities. Source: McKnsey & Company

The timing of each horizon

The timing on the x-axis measures the contributions (or lack thereof) of each horizon to the current market value of the parent. H1 are core businesses that contribute now. H2 are expected to provide very significant contributions to the parent in a 3-5 year timeframe. H3 are clear goals that are expected to contribute in the 5-12 year timeframe.

When applying the Three Horizons of Growth construct, the shape of the arcs will be determined largely by the nature of the industry in which they compete. For example, short-cycle industries like technology would have smaller arcs, whereas long-cycle industries like pharmaceuticals would have much broader arcs. The shape of the arcs is directly related to the nature of the industry, nature of discovery and development, market introduction and regulatory processes that pertain to that industry.

TEIN H3 to H1 process

In the TEIN, the H3 to H1 process (Figure 5) is a four-stage business start-up process used around the world. It uses a combination of CPS, Design Thinking and Lean Start-up methodologies, to achieve a successful solution and final product in the fastest and cheapest possible way.

The key point is that the Critical Litmus Test, in stage two of the process, kills a lot of H3 initiatives. Those that reach stage three are more likely to become a H2 business and develop into a H1 business, which can then scale globally with the help of institutional investors.

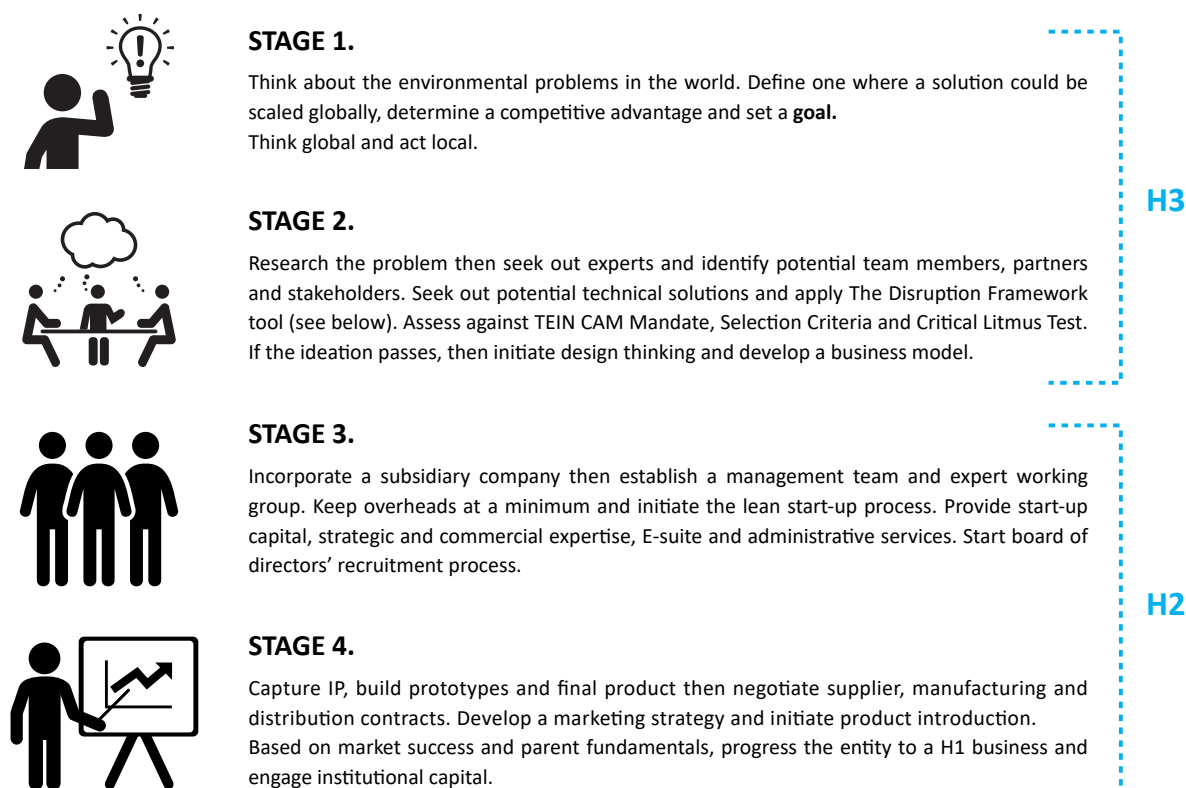


Figure 5 - The TEIN, H3 to H1 process. Source: Natural Impact Group Pty Ltd

The Disruption Framework

The Disruption Framework (Figure 6) is a qualitative tool used to assess a potential innovation and understand whether it will become a disruptive force that develops a new paradigm or be taken up by the incumbent industries and continue to support business as usual. Developed by Bill Sharpe, the tool is known as The Three Horizons Framework³² (referred to as ‘The Disruption Framework’ in this blueprint to save confusion). The framework was also adopted by Kate Raworth in the Donut Economics model.³³

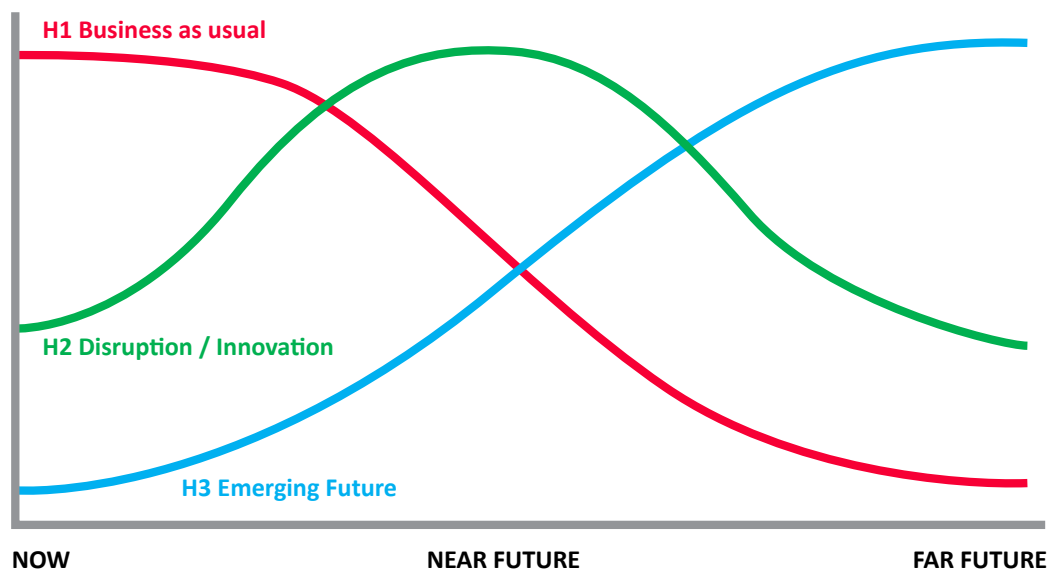


Figure 6- The Disruption Framework (known as The Three Horizons Framework).

Adopted from Bill Sharpe, International Futures

The first Horizon, H1 – is the dominant system at present. As the world changes, aspects of business are no longer fit for purpose.

The third Horizon, H3 – emerges as the long-term successor to business as usual. It grows from fringe activity in the present that introduces completely new ways of doing things.

The second Horizon, H2 – is a pattern of transition activities and innovations. The goal is to enable the emergence of the radically different H3 systems.

The first Horizon is committed to survival and maintaining its dominance by either by crushing H2 and H3 innovation or by co-opting the innovation to support the old system.

The aim of the TEIN is to provide the best opportunity for the right solutions to emerge and prosper. This process may help the TEIN save time and cost in activities that may be crushed by existing paradigms and will ensure the right solutions are developed.

Franchising

Franchising this construct has the capacity to establish a global standard for environmental impact investing. Once the first TEIN (Natural Impact Group Pty Ltd) has demonstrated proof of concept by being profitable (estimated by 2023), it aims to develop a franchise model and grow a global network of TEINs.

The goal is to have at least one TEIN in every country globally and potentially many more in developed countries. A logical approach in developing countries would be to use the TEIN model to support the UNDP BIOFIN initiative to help address the biodiversity boundary.

TEINs will be franchised using the business format franchise model where the franchisor (Natural Impact Group Pty Ltd) provides franchisees with a full range of services and support, and franchisees sign an agreement to conduct operations in conformity with specific guidelines laid out by the franchisor and this blueprint.

According to the International Franchise Association, Franchising is a method of distributing products or services.³⁴

“At least two levels of people are involved in a franchise system:

- 1) the franchisor who lends the trademark or trade name and a business system; and*
- 2) the franchisee who pays a royalty and often an initial fee for the right to do business under the franchisor’s name and system.”³⁴*

Apart from enabling the growth of the TEIN model to achieve planetary equilibrium as quickly as possible, franchising will also encourage the cross-pollination of ideas, access to a global network of expertise, a global network of operations, IP sharing, scaling of new environmental solution and business models, sharing investment opportunities and access to early-stage capital.

Franchising will also enable effective and consistent governance across all TEIN’s globally allowing for standardised global product development and investment themes. It’s envisaged that the above and the integrity of the TEIN structure will be the factors attracting new franchisees.

TEIN vs. other models

The TEIN model is vastly different from the incubator and accelerator models (Figure 7), which also operate in the start-up space. The closest existing model is an innovations lab,³⁵ with some aspects of funds management³⁶ and the addition of a business-for-purpose³⁷ parent entity.

MODEL	EQUITY	MODE*	AIM	STAGE	SUPPORT	INVESTORS	TIME
TEIN	100%	CPS	Goal	Concept	Internal	Internal	>2 years
Incubator	<10%	BBS	Develop	Plan	Consultants	External	<2 years
Accelerator	>10%	PC	Scale	Model	Mentors	External	<1 year

*CPS = Creative Problem Solver

BBS = Basic Business School

PC = Pressure Cooker

Figure 7 - The comparison between TEIN, and the business models for incubators and accelerators. The mode for each relates to the investor stage as shown in Figure 2.

Capital Allocation

The core goal of Natural Impact Group is to be the largest funder of environmental solutions globally and grow, within 10 years, to be allocating \$150m per annum through its foundation. Based on the current 10-year plan, the first stage of that capital allocation will commence in 2023.

The structure of the TEIN, combined with the capital allocation model, is what makes the TEIN unique. Where and how capital is allocated is the key to developing the right innovation and driving change in the right direction.

The approach is to use four background facts to underline our mandate. These are natural capital, the limits to growth, holistic thinking and the planetary boundaries, outlined below with **key points in blue bold**.

The TEIN mandate then uses a three-part system to allocate capital - 1) it defines six Investment Themes, 2) three Selection Criteria and 3) a Critical Litmus Test. The first two are quantitative in nature, and the last is a qualitative process that mitigates greenwashing¹⁵ and mission drift¹⁶ and simplifies impact measurement.

Background

The following provides the background, key points and underlying reasoning that drive the TEIN CAM mandate.

Natural Capital

The definition of Natural Capital is the land, air, water, living organisms and all formations, functionality and interconnectedness within the Earth's biosphere that provide us with Ecosystem Goods and Services.^{1,38} Natural Capital (and by extension, Biodiversity³⁹ and Ecosystems Goods & Services,³⁸ Functionality and Interconnectedness) is imperative for the survival and well-being of all living species.¹ It is the interconnectedness of nature, its systems and processes that makes implementing the right solutions crucial.

Natural Capital is not only one of the five key forms of capital (Figure 8) but underpins the other four so is, therefore, the basis for all biological, social and economic activity on Earth.²

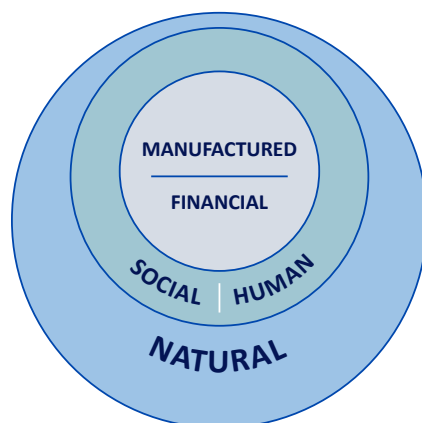


Figure 8 - The five key forms of capital. Adopted from Forum for the Future

The World Forum on Natural Capital⁴⁰ explains the issue of Natural Capital as:

“With financial capital, when we spend too much, we run up debt, which if left unchecked, can eventually result in bankruptcy. With natural capital, when we draw down too much stock from our natural environment, we also run up a debt which needs to be paid back, for example by replanting clear-cut forests or allowing aquifers to replenish themselves after we have abstracted water. If we keep drawing down stocks of natural capital without allowing or encouraging nature to recover, we run the risk of local, regional or even global ecosystem collapse.

Poorly managed natural capital, therefore, becomes not only an ecological liability but a social and economic liability too. Working against nature by overexploiting natural capital can be catastrophic not just in terms of biodiversity loss, but also catastrophic for humans as ecosystem productivity and resilience decline over time and some regions become more prone to extreme events such as floods and droughts. Ultimately, this makes it more difficult for human communities to sustain themselves, particularly in already stressed ecosystems, potentially leading to starvation, conflict over resource scarcity and displacement of populations.”⁴⁰

The key point is that when Natural Capital (especially Ecosystem Services³⁸ and Biodiversity³⁹) becomes unavailable due to over-exploitation or system collapse, Manufactured and Financial capital must combine with Human and Social capital to fill the gap. This adds substantial pressure to the economics of business - as productivity declines, and fixed and marginal costs rise, the ecological footprint expands. The negative impact to return on investment (ROI) of business is significant and exponential as Natural Capital is exhausted.

Furthermore, the cost of “business as usual” doesn’t account for all costs to the environment and society, which helps to run down the balance sheet.

An externality is an economic term referring to a cost or benefit incurred or received by a third party (who has no control over the creation of that cost or benefit). An externality can be positive or negative and can stem from either the production or consumption of a good or service. The costs and benefits can be both private- to an individual or an organization- or social, meaning it can affect society as a whole.

Most importantly, an externality may not affect the entity that causes it. Pollution emitted by a factory that contaminates the surrounding environment and affects the health of wildlife and nearby residents is a negative externality. The cost of which is borne by society, not the factory owner. Designed to rein in the cost of certain externalities to society, the history of regulation shows the benefits can be minimal with fines for non-compliance rarely enough to compensate for the impact of non-compliance. A culture has emerged in some circles that it is better financially to “do the crime and pay the fine.”

The various initiatives in the fields of natural capital and environmental-economic accounting⁴¹ are important developments aimed at addressing how we manage natural capital.

Key points: When natural capital is stated in financial terms, it provides an instinctive management understanding and cohesive language for applying it to investment themes.

Limits to Growth

In 1972, the Club of Rome commissioned a report to analyse the “world problematique” using a computer model called World3, developed at MIT. The report titled *The Limits to Growth* laid out five major trends of global concern - population, food production, industrial production, pollution and consumption of non-renewable resources.⁴² Scientifically, it introduced a newly founded computational approach of “system dynamics” modelling, and quantitative scenario analysis, into the environmental discipline. By linking the world economy with the environment, it was the first integrated global model.

It reached two simple conclusions:

1. *If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity.*
2. *It is possible to alter these growth trends and to establish a condition of ecological and economic stability that is sustainable far into the future. The state of global equilibrium could be designed so that the basic material needs of each person on earth are satisfied, and each person has an equal opportunity to realize his human potential.⁴²*

At the time, it received mixed reviews and was met with substantial headwinds, so consequently, little changes were made at a policy level globally. Several of the original authors published revisions, 20 and then 30 years^{43,44} after the original study. They updated the original work using better data that had become available and determined that the overriding conclusions from the original work were still valid and should be strengthened.

In 2008, an independent review of the data by CSIRO⁴⁵ assessed the three key scenarios presented in *The Limits to Growth*⁴² with the hindsight of 30 years of data. It found:

The “standard run” represents a business-as-usual situation which shows continuing growth in the 20th Century and into the early decades of the 21st Century, but increasing environmental pressure at the start of the 21st Century. The simulation of this scenario results in “overshoot and collapse” of the global system about mid-way through the 21st Century due to a combination of diminishing resources and increasing ecological damage due to pollution.

The “comprehensive technology” approach attempts to solve sustainability issues with a broad range of purely technological solutions. This scenario incorporates levels of resources that are effectively unlimited, 75% of materials are recycled, pollution generation is reduced to 25% of its 1970 value, agricultural land yields are doubled, and birth control is available worldwide. These efforts delay the 21st collapse of the global system to the latter part of the Century when the growth in economic activity has outstripped the gains in efficiency and pollution control.

For the “stabilized world” scenario both technological solutions and deliberate social policies are implemented to achieve equilibrium states for key factors including population, material wealth, food and services per capita. Examples of actions implemented in the World3 model include perfect birth control and desired family size of two children; preference for consumption of services and health facilities and less toward material goods; pollution control technology; maintenance of agricultural land through the diversion of capital from industrial use; and increased lifetime of industrial capital.⁴⁵

The 2008 review⁴⁵ concluded that:

*Unless The Limits to Growth is invalidated by other scientific research, the data comparison presented here lends support to the conclusion from The Limits to Growth that the global system is on an unsustainable trajectory unless there is a substantial and rapid reduction in consumptive behaviour, in combination with technological progress.*⁴⁵

It would seem logical that those involved in a TEIN also play a role in the development of the policies, laws and regulations required to achieve stabilisation faster.

Key points: These reports on the limits to growth underpin the conclusion that the TEIN must focus on the right technological solutions to stabilise the planet environmentally.

Holistic thinking

The Gaia Hypothesis⁴⁶ was formed by the chemist James Lovelock and co-developed by the microbiologist Lynn Margulis in the 1970s. The Gaia Hypothesis posits that the Earth is a self-regulating complex system involving the biosphere, the atmosphere, the hydrosphere's and the pedosphere - tightly coupled as an evolving system. The hypothesis contends that this system as a whole (called Gaia) seeks a physical and chemical environment optimal for contemporary life. Commonly accepted in new age spiritual circles, it is highly controversial in scientific circles. However, it has at a minimum, championed the understanding of the interconnectedness of nature and the need for holistic thinking in environmental management.⁴⁶

The Overview Effect,⁴⁷ a term coined by Frank White in 1987, describes a cognitive shift in awareness reported by some astronauts during spaceflight. Often while viewing the Earth from outer space, some astronauts report overwhelming emotion and feelings of identification with humankind and the planet as a whole. It is the experience of seeing firsthand the reality of the Earth in space, which is immediately understood to be a tiny, fragile ball of life, "hanging in the void", shielded and nourished by a paper-thin atmosphere.⁴⁷ From space, national boundaries vanish, the conflicts that divide people become less important, and the need to create a planetary society with the united will to protect this "pale blue dot" becomes both obvious and imperative. The photograph Earthrise (Figure 9) taken by astronaut William Anders in 1968 during the Apollo 8 mission became, through The Overview Effect, an early symbol for the global environmental movement.



Figure 9 - Earthrise taken from Apollo 8 on December 24, 1968. Source: NASA

Key points: We must use holistic thinking to ensure we incorporate solutions that have a positive impact across as many concurrent planetary boundaries as possible. Some solutions may seem logical to one area, but because of the interconnectedness of nature, implementing it may mean reach tipping points faster in other areas.

Planetary Boundaries

In 2009, Rockström et al.⁵ described an earth operating system and define the boundaries in which it operates. This framework uses science to define where humanity is in relation to those planetary boundaries (Figure 10).

The abstract describes their approach:

“Anthropogenic pressures on the Earth System have reached a scale where abrupt global environmental change can no longer be excluded. We propose a new approach to global sustainability in which we define planetary boundaries within which we expect that humanity can operate safely. Transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental- to planetary-scale systems.

Planetary boundaries define, as it were, the boundaries of the “planetary playing field” for humanity if we want to be sure of avoiding major human-induced environmental change on a global scale.”⁵

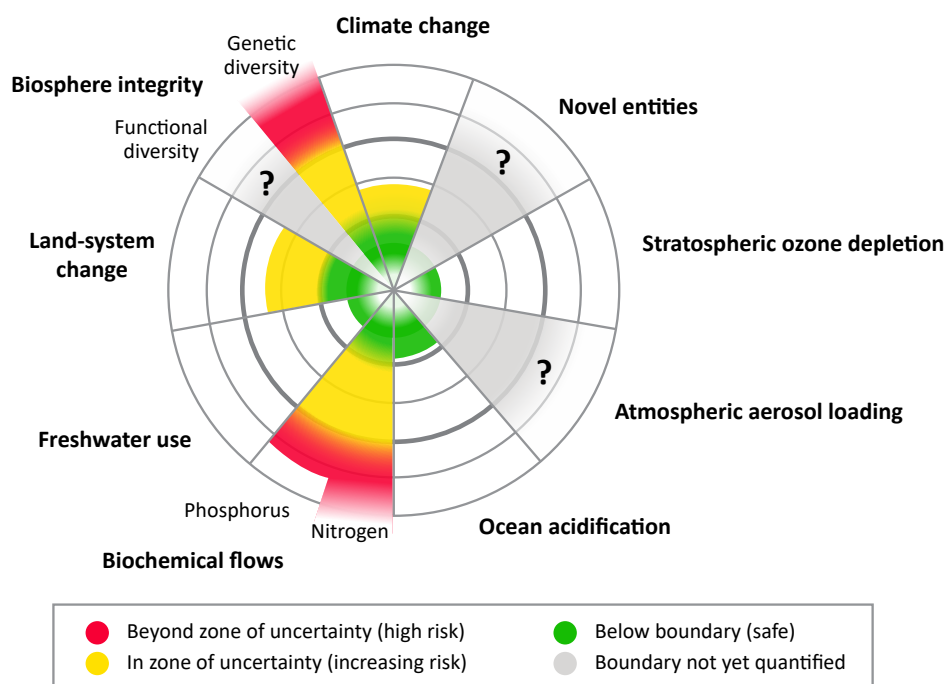


Figure 10 - The planetary boundaries. Source: Stockholm Resilience Centre

Key points: The planetary boundaries provide the TEIN cluster structure for H3 growth and the ability to focus efforts and capital on the boundaries that are of the highest risk.

Mandate

We must:

1. seek the right technology-based solutions to Natural Capital issues, within the planetary boundary landscape;
2. seek solutions within six defined Investment Themes;
3. apply the selection criteria to ensure we're aiming for global scale; and
4. apply the Critical Litmus Test to mitigate greenwashing¹⁵ and mission drift¹⁶ and simplify impact measurement.

Investment Themes

To identify the best opportunities, all projects must be designed to **directly** mitigate an issue within one of the planetary boundaries (Figure 9). The following investment themes focus on 11 Sustainable Development Goals (SDGs)²² and broadly align with the World Bank Group Climate Change Action Plan.⁴⁸ Themes relating to SDGs three and four should also be designed to bridge the gap for the final six SDGs through education and media.

Investment themes are:

- (A) Agribusiness & Natural Capital (regenerative economy)
- (B) Asset Recovery & Recycling (circular economy)
- (C) Clean Technology & Efficiency (clean technology)
- (D) Environmental Markets & Services (market-based funding solutions)
- (E) Education & Media (generational change)
- (F) Remediation & Management of Natural Capital (environmental stability)

Selection Criteria

To ensure projects and investments are designed to properly align with the mission and mandate (and not “greenwashed”) the Selection Criteria and Critical Litmus Test must be applied together. The Selection Criteria must be prioritized in the following order of importance, with 1. being the top priority:

1. The best care of Natural Capital
2. Global scalability with a competitive advantage
3. Potential Internal Rate of Return (IRR)⁴⁹ of +20%

Critical Litmus Test

The Critical Litmus Test is a way of applying a qualitative assessment to a quantitative investment model and adding rigour to the decision-making process.

Greenwashing¹⁵ and mission drift¹⁶ are substantial risks due to the investment focus over the last 20 years being on consumerism and financial engineering.⁵⁰ Humans are biological creatures that rely on Natural Capital to exist and in doing so, have developed various physiological, spiritual and cultural connections to Natural Capital (the environment). Greenwashing taps into these connections to gain traction.

Most importantly, implementing some well-meaning technologies could result in reaching tipping points faster (eg. By failing to consider whole system function), rather than solving the problem. This Critical Litmus Test is the key to mitigating this and ensuring each solution has a positive impact on the other planetary boundaries.

To avoid greenwashing and mission drift, a Critical Litmus Test process must be used in Stage 2 of the Three Horizons for Growth process and before a potential solution is developed further. This mitigates the need to identify measurement metrics in the early stages of investigation and is carried out via three simple questions:

1. Does the potential solution aim to “provide the best care and management of” or “extract more from” any form of Natural Capital?;
2. Does the solution aim to provide a “business-as-usual” advance in productivity to support growth demands and/or capitalise on population growth and consumerism or does it have, at its core, a new approach to Natural Capital?; and
3. Does the solution support humanity’s connection or disconnection (spiritual, cultural or ecological) to Natural Capital?

The correct answers to these questions are (1) it provides the best care and management, (2) it has a new approach and (3) it supports a human connection to nature. Having some incorrect answers means more time, and CPS is required to create the right solutions. Until it has all three correct answers to these questions, the solution must remain within the Horizon, H3. Critically, this core tenet provides the underlying integrity to the TEIN.

Investment model

It’s generally accepted that the purpose of a business is to make a profit and generate wealth for shareholders. We agree with that construct, but as the parent entity is a business-for-purpose enterprise, shareholders in the parent entity generate wealth via long term capital gain. This requires “sticky capital” similar to a managed fund without redemptions. The exit for TEIN shareholders is at year 10 - either through a management buyout, trade sale or Initial Public Offering (IPO).

Generally, institutional investors invest in the subsidiaries at the stage these investments can become liquid via an IPO and listing on a stock exchange.

Valuations

The TEIN Model uses the 2018 International Private Equity and Venture Capital (IPEV) Valuation Guidelines⁵¹ to determine fair value for subsidiaries.

Ethos

The TEIN ethos draws from the lessons learnt from the world's greatest companies, teachers and philosophers. Much care must be taken to build the right culture.

The ethos of the TEIN model is to be entrepreneurial with a high level of ethics and integrity driven by governance, accountability and respect within a flat organisational structure. The aim is to grow a new global construct that will stand the test of time and lead by example. Overall, the model closely subscribes to the key findings in books like *Built to Last: Successful Habits of Visionary Companies*,⁵² *Good to Great: Why Some Companies Make the Leap...and Others Don't*⁵³ and *In Search of Excellence*.⁵⁴

Our basic charter is:

- We are accountable to each other and all future generations.
- We are only as good as our people, so engage with the best in the world.
- We aim to demonstrate that business will deliver the right solutions for all life on earth.
- We use the best parts of capitalist model and apply them to change the world for the better.
- We don't just accept the status quo, we ask why.
- We understand risk and use it to our advantage.

Governance

Governance encompasses the system by which an organisation is controlled and operates and the mechanisms by which it, and its people, are held to account.

Each TEIN must become a leader in governance and risk management, committed to the effective governance and administration of the parent entity, all its subsidiaries and franchisees. Full and effective corporate governance must be developed and employed at the earliest stage of the formation of each TEIN, each subsidiary and each franchise.

Business for purpose

The concept of a business-for-purpose model is that it uses a financial engine (business) to provide cash flow to deliver an intended outcome (purpose).

The parent company is developed as a business-for-purpose company, by enshrining this concept into its constitution. This then provides the directors with a clear mandate, used alongside board charters, to deliver the best environmental outcomes based on a true triple bottom line concept.⁵⁵

Although directors of Australian companies may choose to take the interests of employees, customers, suppliers and the community into account, directors face considerable legal uncertainty as to whether they are properly discharging their statutory and fiduciary duties should they choose to favour non-shareholder stakeholder interests over the financial interests of shareholders. This is sometimes referred to as the "shareholder primacy" norm. One way to address this in Australia is to change the *Corporations Act 2001*⁵⁶ to include a "benefit company" structure⁵⁷ which is becoming increasingly popular across the world. Natural Impact Group is an advocate for the inclusion of this corporate structure.

While the business-for-purpose structure allows the directors to operate with a completely different mindset, there is also a requirement to ensure the company can compete globally. The implementation

of a significant performance-based, profit share scheme (similar to that operated by Macquarie Bank⁵⁸), should deliver the desired goal of attracting and retaining the best people, minimise equity dilution to shareholders and potential mission drift.

Without the business-for-purpose model being at the heart of the TEIN, it runs the risk that the TEIN becomes another capitalist-driven venture development model (i.e. mission drift).

Partnerships

TEINs will seek to partner with other organisations, especially universities and research organisations nationally and globally, to bring the best minds and practitioners together in the development of environmental solutions. As each organisation and solution will generate unique partnership structures, the aim is to seek out the best in the world and partner with them on a mutually respectful basis and share in the benefits.

Government

To achieve the policy changes that are required for planetary stability in the timeframe and scale required, it's imperative to have a voice with political decision-makers at all levels of government. This must be done with the highest integrity and openness.

Environmental Impact Investing

The definition of impact investing is “investments made into companies, organizations, and funds with the intention of generating a measurable, beneficial social **and/or environmental** impact alongside a financial return.”⁵⁹

In Australia, and increasingly so globally, the term impact investing is generally used to describe Social Impact Investing (SII). A TEINs core goal is to focus purely on environmental, not social, impact investments, therefore, coining the term Environmental Impact Investing (EII).

While the TEIN model is supportive of positive social impact, (indeed, it's a necessity), the most productive way to have a positive social impact is through the care of Natural Capital. First Nations people around the world have instinctively understood this concept for tens of thousands of years which is evident in the fact they represent about 5% of the global populations and care for about 80% of global biodiversity.⁶⁰

STEM

Each stage of the industrial revolution has built on the previous one to generate “progress” and is directly related to the global population growth⁶¹ creating market opportunities (consumerism). The current (fourth) stage in the industrial revolution of Science, Technology, Engineering and Maths (STEM) presents as the best opportunity and enabler to achieve global stabilisation (Figure 11).

The first three stages of industrial revolutions have culminated in the advent of- the internet of things, artificial intelligence, genetically modified organisms and synthetics (especially petrochemicals and pharmaceuticals). Generally, these technologies remove the human connection to Natural Capital and are instead based on improving productivity to meet economic, consumer and population growth.

demands (business-as-usual). Other STEM themes (e.g. RNA, data mining, cleantech) have the potential to understand environmental problems in greater detail and drive solutions on the scale required to create the appropriate change in the necessary short timeframe.

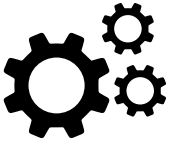

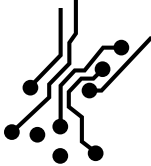

STAGE	FIRST	SECOND	THIRD	FOURTH?
				
Theme	Machines	Mass Production	STEM	Sustainability?
Energy	Fossil Fuel	Fossil Fuel	Fossil Fuel	Renewable?
Prevalent	~1760	~1860	~1960	~2060?
Population	~0.8bn	~1.3bn	~3bn	<9bn?

Figure 11 - The TEIN model aims to provide for a fourth stage (Sustainability) in the Industrial Revolution

Furthermore, the culmination of these stages, over the last ~260 years, has led to massive overconsumption from an exponentially growing population. Work by the Global Footprint Network shows that it takes the earth one year and eight months to regenerate what humanity uses in one year (1.8:1).⁶² For us to have a sustainable planet this need to be brought back to below one (<1:1). STEM offers this opportunity.

The ultimate aim of the TEIN model is to use STEM to reconnect humanity to Natural Capital (Nature) and provide for a fourth stage in the Industrial Revolution, one of true sustainability. The aim is to advance humanity’s tenure on Earth while retaining (and improving) the standard of living and quality of life of ALL its inhabitants. This leads us to a warning. Natural Capital has evolved over billions of years to autonomously function at its optimum level, and the egotistical view that humanity can technologically improve on Natural Capital’s function through artificial means does not take into consideration the interconnectedness of all forms of Natural Capital and the externalities. The true cost of the last three stages of the industrial revolutions is becoming clear, and so too the fact that we can’t replace nature with STEM or any other form of capital- we must use STEM as a tool to allow nature to heal itself.

“Our vision is a world where every human understands and values the importance of Natural Capital...and acts accordingly, without greed, selfishness or apathy!”

Rod Holden, Founder & CEO of Natural Impact Group Pty Ltd

Impact Measurement

Due to the capital allocation model and especially the Critical Litmus Test, measuring impacts is a relatively simple process. Also, the progress and impact of environmental projects can generally be measured via the use of baseline and life cycle assessments.⁶³

General Metrics

If the Mandate and Critical Litmus Test are followed, to develop IP and business models, then measuring environmental impact is relatively straightforward. The opposite is also correct - the further away from nature a project or product becomes, the harder it is to measure the impacts of change.

As impact investors, it's important to measure impact transparently. The TEIN model allows this process to start at the planning and implementation stages. Conducting regular evaluations ensures the intended impact continues to be positive as the business grows and that it is readily available for due diligence purposes when attracting new capital. The following are the preferred tools to be used as a fit for purpose:



The SDG Compass to measure and manage the contribution against the UN Sustainable Development Goals.



The IRIS platform for measuring and reporting environmental impacts.



The Natural Capital Protocol to measure the impact on Natural Capital.



The Gold Standard for SDG project/product certification



The B Corporation certification for social license and measure business improvement

Sustainable Development Goals (SDGs)

Each solution should relate to the United Nations SDGs²² and aim to incorporate as many SDGs as possible, as a measurement metric.

This is quite easy to do as 11 of the 17 SDGs, either directly or indirectly, relate to the use and management of Natural Capital. These are SDG3 (Good health and wellbeing), SDG4 (quality education), SDG6 (clean water and sanitation), SDG7 (affordable & clean energy), SDG9 (industry, innovation and infrastructure), SDG11 (sustainable cities and communities), SDG12 (responsible production and consumption), SDG13 (climate action), SDG14 (life below water), SDG15 (life on land) and SDG17 (partnerships for the goals).



Figure 12 - The 11 SDGs that relate directly and indirectly to the care of natural capital. Source: United Nations

Aichi Biodiversity Targets

At the 1992 Rio Earth Summit, 150 government leaders signed the Convention on Biological Diversity⁶⁴ dedicated to promoting sustainable development. At the tenth meeting of the Conference of the Parties,⁶⁵ a revised and updated Strategic Plan for Biodiversity was adopted, including the Aichi Biodiversity Targets²⁴ (Figure 12), for the 2011-2020 period. They include five Strategic Goals, each with associated targets:

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society (Targets 1, 2, 3, 4)

Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use (Targets 5, 6, 7, 8, 9, 10)

Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity (Targets 11, 12, 13)

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services (Targets 14, 15, 16)

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building (Targets 17, 18, 19, 20)

Each solution developed by a TEIN should meet, and be measured against, at least one target within each strategic goal.

Taking Action

Reflecting on the current situation, several needs stand out that require action. The need for humanity to restore its connection with nature, the need for immediate action, the need for the right action to be taken, and the need to apply some new rules to capitalism that protect the common good.

To do these we can't just manage our way into global solutions. We don't have time. We must be bold and aim for the biggest and best outcomes imaginable, and don't stop until we've achieved them. This is the essence of how every successful entrepreneur achieved their own success and how every goal has ever been achieved by humankind. It's how we stood on the Moon within 10 years of committing to that goal.

Our disconnect from nature has seen us cross planetary boundaries and load-up the natural capital balance sheet with debt. The modelling and real-time data show us that the deadline for determining the future of humanity, and the majority of species on earth, is looming. Scientific modelling also indicates that developing new technologies might extend the deadline to reach global sustainability for another few decades, but due to the interconnectedness of nature we need to be cautious and holistic in our approach, or we seriously risk making matters worse.

It would be great for policy and legislation to take the lead on global sustainability, but the capitalist system continues to drive change. Rather than completely restructure the capitalist system, and fight the headwinds that would entail, it seems timelier to simply implement a new, self-imposed, ethos to the capitalist's system. One specifically designed to achieve our goals. One with integrity, intelligence and empathy at its core. If this can be demonstrated to deliver superior investment returns, the take-up of the model and ethos could be exponential.

In summary, we are running out of time to act, we need cultural change within the capitalist system, and we need much more, meaningful action that is woven together to in a way that fits into nature's big picture. Importantly, it's the willingness to go all-in on goals that allows the right solutions to emerge. We need to take on the risk, mitigate the downside and move fast. Paradoxically, this is also a path to achieving investment alpha and has parallels to a hedge fund strategy.

But most importantly, basing a cultural change on caring for and reconnecting to nature takes a non-egotistic, selfless view, that acknowledges the ecological fact that humans are a part of the cycle of life on earth, not at the pinnacle of a hierarchy. Doing this delivers a values-aligned approach that is unambiguous and therefore, easy to extend to other areas of society.

Although the detail is in the doing (Natural Impact Group), this blueprint presents the actions and plans needed to solve the natural capital emergency and to achieve global sustainability. It's built on the values of generosity, altruism, intelligence and integrity and underpinned by an ethos based in the lessons learnt from the world's greatest companies, teachers and philosophers.

As this blueprint continues to evolve, I relish three things. The creative problem solving that initiates new solutions, building more collaborations to share the success of achievement and proving we can generate alpha against any benchmark. These are the sweetest fruits on my path of taking action.

Rod Holden
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The tragedy of the commons is a situation in a shared-resource system where individual users, acting independently according to their own self-interest, behave contrary to the common good of all users by depleting or spoiling the shared resource through their collective action.
- Gus Speth famously said "I used to think that top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that thirty years of good science could address these problems. I was wrong. The top environmental problems are selfishness, greed and apathy, and to deal with these we need a cultural and spiritual transformation. And we scientists don't know how to do that."
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- Australian Renewable Energy Agency. *What is renewable energy?* [online] (2020). <https://arena.gov.au/what-is-renewable-energy/>

Renewable energy is produced using natural resources that are constantly replaced and never run out. Just as there are many natural sources of energy, there are many renewable energy technologies.
- Ellen MacArthur Foundation. *What is a circular economy? A framework for an economy that is restorative and regenerative by design* [online]. <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

In a circular economy, economic activity builds and rebuilds overall system health. The concept recognises the economy needs to work effectively at all scales – for large and small businesses, for organisations and individuals, globally and locally.
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In formal terms, responsible investment is a process that takes into account environmental, social, governance (ESG) and ethical issues into the investment process of research, analysis, selection and monitoring of investments.
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Instead of a mere 10% gain, a moonshot aims for a 10x improvement over what currently exists. The combination of a huge problem, a radical solution to that problem, and the breakthrough

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