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Frontier Firms: A Commentary.

Introduction:

Congratulations on your draft report – a clear statement of where we have failed in capitalising on NZ innovation and its consequences resulting in poor productivity.
I have 50 years' experience in innovation in NZ and endorse all your recommendations. It has been a long period of frustration, and at significant cost to my company, to see us continuing to slide backwards in comparison to other like countries.
This decline has been obvious since 2007 when the first of the Global Innovation Index (GII) reports were published by Cornell University. These studies are conducted over 130 countries and highlight our failures, even chiding us on occasion for doing so badly.
Yet our politicians fail to listen to either the innovation industry, such as it is, or their technical advisors, assuming they have any?
We are now ranked 26th in the GII compared to countries of similar size such as Sweden, Netherlands, Denmark, Finland, and Singapore who are all in the top 8 of the rankings. Even worse, we fail to make a single entry into a list of the world's top 100 innovation clusters (GII 2020 - page 44.)

Increased productivity, based on innovative technology, is fundamental to solving NZ's problems of low incomes, inequality of wealth, child poverty and many other issues, yet our successive Governments have failed to recognise and address our failures.

Who am I:

I have spent my career in innovation and have successfully invented and developed several projects which would have led to major export industries had there been a source of seed capital and/or Govt financial support.
My early company (65 staff) was rated by Auckland University ("Theory K" ISBN 0-908610-43-2) as the most innovative in NZ. We probably had the best team of development engineers in the country at that time.

1. We achieved success with world leading advances in the formative years of the PC, and successfully competed with IBM and others designing and building locally manufactured MX computers for NZ Local Bodies, and businesses.
2. Under contract to the BNZ we developed, and had certified by Data Bank, the world's first EFT terminals capable of being used on the public telephone network. The BNZ went bust, defaulted on the contract, and then crushed my company to avoid being sued for breach of contract. The Govt bailed out the BNZ but refused to assist us and other small companies caught in the same fallout. NZ lost an opportunity to have a major export industry based on unique innovative high-tech.
3. A low-cost phone system that displayed real time cost of the call and was also capable of Lease Cost routing.
4. My latest, and potentially most significant innovative project, has been the development of a new form of VTOL aircraft - the **LRC Project**. Proven technology

that applies to all aircraft from small drones up to large VTOL aircraft never thought possible, with multi-million-dollar export potential.

Today I am just a one-man company but to give you some feedback on just how serious the situation is at the innovation coalface I have detailed below my actual experiences in seeking NZ Govt aid in my attempts to develop the LRC technology now partially protected by 13 patent applications (which I can no longer afford to maintain).

Auckland University and other CAA approved consultants have played a major role in providing analysis and prototype testing. Their work, and others, is fully documented in official reports available to any investor.

The LRC Project:
Visualise a time when the majority of short haul air transport is now by VTOL (Vertical take-off & landing). Aircraft arrive and depart from compact sites covering no more than a few acres, or even rooftops, close to towns and cities? Lengthy and costly 3000m concrete runways and hundreds of acres of real estate are no longer required along with all the infra-structure costs of feeder roads to such airports.
The low cost of LRC aircraft and air fares have reduced and the frequency of service improved substantially? These aircraft are quieter, and safer with an excellent green footprint. They are initially Hybrid electric powered but future proofed for full electric operation as battery technology evolves.

Landings and take-offs of today's aircraft with their highly dangerous landing speeds have been replaced by LRC aircraft that land as gently as a feather, with reduced noise levels such that near silent landings and take-offs are possible.

Greatly expanded air traffic services have evolved feeding small towns and communities who can now enjoy substantial regional development with reduced infrastructure costs.

LRC aircraft use patented rotor systems that are more efficient and more compact than any used by existing aircraft. A high level of redundancy introduces lower cost and a level of safety never achieved in the history of Aviation.

Construction is carbon fibre and existing NZ super yacht builders are interested.

The LRC technology has been extensively proven by prototype testing, and peer reviews by some of the most experienced people in NZ including Auckland University, Gurit Asia Pacific Ltd, ex DSIR scientists, Dr. of mathematics from Cambridge University (UK), Dr. of Physics (Cornell University),and CAA approved consulting engineers.

Auckland University's research into my inventions involved more than 12 months study including the theoretical analysis of the rotor system to mathematically prove the lift forces generated. They also carried out lifting tests on prototype rotors to confirm good agreement between theory and practice. Peer reviews are available and are overwhelmingly supportive.

It is estimated that the LRC Project has the potential for export sales of billions of dollars and employment of +400 staff within 5 years.

Yet I am unable to raise a flicker of interest from the Govt with bureaucratic roadblocks set up in a system to frustrate and block individual innovators from receiving support. Not a single Govt appointed engineer or scientist has read either my submissions or the University reports – all this work has been ignored. An insult to those parties who have devoted hundreds, and in some cases thousands of hours to the project.

Why we have failed:

- There is no financial support for start-up companies (i.e., non-taxpaying) who have developed potentially promising innovation projects. Yet this is the most fertile ground where major breakthroughs in innovation are born - the Wright Brothers, Apple computer, and many others.
- There is no attempt to qualitatively evaluate potential innovative concepts which can vary in quality from worthless trivia to ground-breaking on a global scale. The gold standard in innovation is when it is uniquely original with no existing competitors. Projects that claim such a high status in innovation are rare and under our present policies with no technical appraisal we would not recognize them if we were fortunate to have them fall into our laps. (Refer: "From Zero to One" by Peter Thiel.)

The existing Govt policies on encouraging new productivity based on innovation does not work as can be seen from the GII and urgently needs replacing. (See below)
There is also a stubborn attitude right at the top of Govt to refuse to accept these failures and to listen to alternative ideas from those experienced in the field. (See below – email evidence available). The same can be said for the politician's technical advisors in fields such as supporting innovation, where they appear to be woefully silent?

To Summarise:

- There are no technically competent engineers or scientists within the entire Government system to evaluate the merit or otherwise of any high-tech innovative project, including the LRC Project. Gold plated peer reviews are worthless when the evaluation team (NZ Govt) does not have a single technically competent review person.
- R&D grants in the form of tax rebates do not help start-up companies.
- There is an attitude that such ambitious projects are too big for NZ. Senior Govt executives are on public record as saying that NZ innovation going offshore is still good for NZ as we have an opportunity to pick-up a few crumbs – really?
- I have referred the current Minister of Science & Technology to the GII reports highlighting our alarmingly poor performance: Creative goods exports 0.5% ranked 65th in the world - Total creative Outputs: 33rd - High & Medium high-tech manufacturing 69th - but the Minister fails to show any concern or seek technical guidance. She refuses to consider any exceptions to the current R&D grant system regardless of a project's technical and innovative merits. If you went to the Minister's office asking for seed capital for a new industry that turned lead into gold you would be turned down!
- Callaghan Innovations are sympathetic and would like to help. But they are restricted by central Govt rules that prohibit any financial support unless the applicant first

fronts up with a minimum of 60% of the finance. So new start-up companies are excluded from any support and their quality of innovation is again irrelevant.

- I applied for development funding under the PDF scheme to create a new frontier industry employing 400 staff with large export potential in any NZ regional district. MBIE non-technical staff advise that I am unsuccessful as I would not be employing enough staff before the next election then 12 months away! No one reads my technical reports or peer reviews.
- There appears to be an inbred reluctance by Govt to pick winners in fear of getting it wrong. I agree they are not good at it, but they have an inescapable responsibility to ensure taxpayer funding is prudently invested and they cannot do this without qualitative analysis of the innovative technology. The present system is wide open to abuse.

How do successful countries pick winners?
My son, Dr. Dale M Lovelock, is a Dr. of High Energy Nuclear Physics from Cornell University, but specializes on Medical Physics. He is acting director of radiation treatment research in the USA with a staff of 140 other physicists & software engineers based at Sloan Kettering Memorial Hospital NY, the centre of cancer radiation treatment research in the USA.
The procedure for development grant approval is that his team presents their arguments to a panel of outside peer experts all in the same field as the applicants. Depending on the technical and innovative quality of the application the proposal will either be accepted with 100% funding or rejected back for further consideration - simple and highly effective, that is why the US are No 3 on the world's rankings for innovation.

Start-up NZ companies could be treated in the same fashion. Is this the way NZ Research Institutes obtain funding approval? Then why not private R&D companies being treated likewise?

Other Suggestions:
Wealthy Immigrants & NZ citizenship:
NZ is becoming a much sort after location - a bolt hole for wealthy parties.
Govt should have a list of private NZ companies seeking either equity partners or direct sponsorship funding for frontier firms. Pending immigrants are offered the opportunity to invest and if an agreement is confirmed by both parties then such applicants would receive preferred immigrant status. Govt rules retain the technology in NZ.
PGF Funding for innovative productivity:
If the PGF funding budget is to be revitalized, then some priority should be given to those with innovative content?

The COVID-19 Virus (To quote from the latest GII report):
Confronted with an unprecedented crisis, we need to fully leverage the power of innovation to collectively build a cohesive, dynamic, and sustainable recovery. We need to emphasize the countercyclical role of policies to ensure the continuity of innovation financing.

John Lovelock BE