[redacted] - personal submission to MBIE's Energy Transition consultation - 1st Nov 2023:

Introduction

The purpose of my submission is to address the glaring omissions in the MBIE's consultation document on New Zealand's energy transition. While the consultation covers various aspects of energy policy, it fails to consider critical issues that are urgent, of critical importance, and therefore and fatal to the analysis attempted.

Lack of Systems Thinking

Narrow Focus on Emissions

While emissions reduction is crucial, the TOR's singular focus on this aspect overlooks the broader context of energy use and supply futures. This narrow lens fails to consider the systemic implications of energy policies.

Ignoring Fossil Fuel Volatility

The TOR does not adequately address the volatility and impending depletion of fossil fuel supplies. This omission is a critical gap, given that fossil fuels are a foundational element in the transition to renewable energy systems.

Competing Priorities

The TOR treats energy affordability, security, and environmental sustainability as competing priorities. In reality, these elements are interconnected and should be approached from a systems thinking perspective.

Absence of Supply-Side Constraints

The strategy is not guided by supply-side constraints, which are fundamental to any energy transition. Ignoring these constraints simplifies the problem at the cost of overlooking a key driver of change that will thwart plans made in ignorance.

The Bigger Picture

Limits to Growth

The notion that our current energy systems can sustain perpetual growth is not only flawed but dangerous. The limitations of our resources and the environmental impact of our energy choices are often overlooked. The finite nature of fossil fuels, the degradation of ecosystems, and the increasing energy cost of extraction are all indicators that we are reaching the limits of growth.

Energy Descent

The concept of 'energy descent' offers a more realistic scenario for our future. Instead of aspiring for endless growth, we should prepare for a future where we have to make do with less. This involves transitioning to more sustainable energy sources, reducing consumption, and rethinking our societal values around growth and prosperity.

Energy Crisis

The current energy crisis is not a temporary glitch but a result of systemic issues that need to be addressed. The increasing demand for energy, coupled with the declining availability of cheap and abundant energy sources, is leading to an inevitable crisis. This crisis will have far-reaching implications, affecting everything from the economy to social stability.

Net Energy Blindness

The focus on the gross energy output of various sources without considering the net energy they provide is a significant oversight. This 'net energy blindness' skews our understanding of the true cost and benefits of different energy sources. For example, the energy return on energy invested (EROEI) is a critical metric that is often ignored. A low EROEI means that an energy source may not be as beneficial as it appears at first glance.

The Illusion of Growth and the Reality of Contraction

The Limits of Financial Engineering

The prevailing economic models, including those used in energy futures in the NZ government are built on the illusion of perpetual growth, facilitated by financial engineering. This engineering involves the rapid expansion of debt and quasi-debt, enabled by sub-inflation interest rates. However, this model is fundamentally flawed. The real GDP growth that we observe is largely a result of this financial engineering. For every dollar of 'growth' in real GDP, there is an accompanying $3.20 of net new borrowing. This is not sustainable growth but a form of self-deluding fakery.

The Circular Nature of Asset Valuation

Asset prices, often used as collateral for this burgeoning debt, are inflated as a result of the same financial engineering. This creates a circular, self-reinforcing system where rising asset prices justify more borrowing, which in turn inflates asset prices further. However, these asset valuations are notional and do not reflect the 'utility value' of these assets. The utility value of an asset is the real, tangible benefit it provides, such as the dividends from a stock or the shelter provided by a property.

The Disconnect with the Real Economy

The financial economy has become increasingly disconnected from the real economy, which is the production and distribution of goods and services. The real economy is fundamentally an energy-material process. It uses energy to convert raw materials into products. As the financial economy grows through artificial means, it masks the underlying contraction in this real economy of energy. The transition to lower-density renewable energy sources will further contract the real economy, contradicting the assumptions of perpetual growth.

Implications for New Zealand's Energy Transition

The MBIE's consultation document does not address these fundamental economic realities. It operates under the assumption that the transition to renewable energy can occur without economic contraction. This is a critical oversight. Any energy transition strategy that does not consider the economic implications of moving to lower-density energy sources is incomplete and likely to fail.

By ignoring the economic contraction implicit in the energy transition, the strategy also fails to prepare for the social and economic challenges that will arise. These challenges include the need for new economic models that are not dependent on perpetual growth, as well as social policies to manage the economic contraction in a just and equitable manner.

Conclusion

The MBIE's consultation document on New Zealand's energy transition is fundamentally flawed in its omission of these critical issues. Any policy decisions based on this flawed analysis are likely to be short-sighted and could have severe long-term consequences. It is crucial to broaden the scope of the discussion to include these overlooked but vital aspects of our energy future. Failure to do so will result in a strategy that leads to unnecessarily poor outcomes for Aotearoa's future.

References

1. Ministry of Business, Innovation & Employment (MBIE) - Consultation on Advancing New Zealand's Energy Transition
2. Effective Altruism Forum - The Great Energy Descent: Short Version
3. The Honest Sorcerer - This Energy Crisis is Here to Stay
4. Surplus Energy Economics - The Soufflé Economy
5. More of my individual and collaborative writing and talking on this and related topics - Submissions and Presentations

Appendix - Wise Response submission on the Terms of Reference for the Energy Strategy workstream:

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

TERMS OF REFERENCE

NEW ZEALAND ENERGY STRATEGY

October 2022

Wise Response commentary in dark red.

Context for an energy strategy

1. Energy is essential to the economy and the lives of New Zealanders. It is used across the economy in transport, electricity, for heating and by industry. It is fundamental to the health and wellbeing of our communities and people.

It is also fundamental to the correct function of our economies. As Steve Keen has observed, Capital without Energy is a sculpture, Labour without Energy is a corpse. The truth surfaced by Steve Keen's modelling[1], showing the exponentials used in the production function by conventional economic modelling must be revised to give at least some prominence to the fundamental role of energy in underpinning economic output.

2. In 2020, emissions from energy made up 40% of our total gross emissions. We will need to do things differently if we are to create a sustainable energy system for generations to come.

The focus on simply emissions reduction is important, however it must also be placed alongside energy use and supply futures to understand the bigger picture within which our 'forward operating environment' lives. This includes forward assessment of global supply chains and resources required to support a 'sustainable energy system'.

3. To meet the 2050 target of a net zero emissions economy, we need a transformed energy system, with much lower reliance on fossil fuels and increased reliance on renewable electricity and low emissions fuels. As the sector transitions over the next 30 years, we must ensure that:

- energy remains accessible and affordable to support the wellbeing of all New

[1]

Zealanders

The fuel price inflation that we are seeing currently (which is just the beginning of price volatility we can expect), has already put energy into the unaffordable (and potentially inaccessible as a result) category for many in New Zealand. What will we do when we get another couple of years closer to the drawdown of the natural gas supply that MBIE's own figures show will be depleted within a decade or so, and the associated price spikes? What lessons can we learn from the current European predicament in this regard?

- energy supply is secure, resilient, and reliable throughout the transition and beyond

The energy supply from fossil fuels will not be secure, resilient or reliable through the period in question. Already, global oil production is in decline (all liquids peak supply was Nov 2018 according to the IEA). Because fossil energy is a fundamental ingredient in building renewable energy systems any instability threatens that transition.

- energy systems support economic development and productivity growth aligned with the transition.

The economic development and productivity growth that we can achieve by 2050 will be heavily influenced by fossil fuel supply disruption.

The realities of fossil fuel resource depletion addressed above mean that we do not have 30 years to transition away from fossil fuels. The key understanding is that the surplus energy, net of the Energy Cost of Energy (ECoE) is declining much faster than the total energy supply (which is itself in decline). The economic commentator Tim Morgan outlines this reality well: bit.ly/SEE_Summ concluding:

> "*...Most of those products and services that we deem "essential" – including water, food, housing, infrastructure and the transport of people and products – are energy-intensive, meaning that the real costs of necessities will continue to rise, even as overall prosperity erodes.*
>
> *This means that the affordability of discretionary (non-essential) goods and services – those things that consumers might want, but do not need – will contract, with obvious implications for large swathes of the economy*
>
> *Orthodox economics continues to deny all of this, asking us to believe that there is no material shortage that cannot be overcome by using financial "demand" to push prices upwards.*
>
> *The reality, though, is that no amount of demand, and no increase in price, can produce anything that does not exist in nature. Neither can any amount of technological genius overcome the laws of physics in general, or the laws of thermodynamics in particular.*
>
> *Recent trends, albeit overshadowed by concerns over Covid and Ukraine, are confirming that the "precursor zone" has ended; that economic contraction has begun; and that even the myth of perpetual "growth" can no longer be sustained.*
>
> *Beyond high inflation, deteriorating prosperity and the erosion of discretionary consumption, this also means that the financial system faces*

a process of drastic downsizing, a process that can be expected to be disorderly.

The debate – between orthodox 'perpetual growth' and material (and environmental) physical constraint – may run for some time yet, but the outcome is now beyond dispute.

The question now devolves into one of preparation and adaptation, which can only start once the reality of economic limits is grasped."

4. A significant amount of work has already taken place that we now need to build on. To date, the Government's renewable energy strategy work programme has guided work to decarbonise the energy sector and prepare it for a more renewable future. The first Emissions Reduction Plan (ERP) released in May 2022 set out a broad range of actions to reduce energy and industry emissions.

This work has not been guided by the reality outlined above, which markedly shortens the timetable within which this work must occur. In parallel the ERP should be accompanied by an energy use reduction plan (ERP)^2

5. One of these actions is the development of an energy strategy by December 2024. The development of a strategy provides a real opportunity to ensure that steps to decarbonise are coordinated and considered across the whole energy system.

The probability is that events will get ahead of this strategy if we take two years to develop it. By taking into account supply side constraints as we have outlined, the possibility exists to take a number of impossible options currently attracting funding out of play, and simplify the decision making process.

6. The New Zealand Energy Strategy (the Strategy) will help set pathways to achieve our objectives and provide certainty for the sector, consumers, and industry. It will set the direction for New Zealand's pathway away from fossil fuels and towards greater levels of renewable electricity and other low emissions alternatives.

The Energy Supply trajectory will rule out many pathways currently under active consideration, simplifying strategic decision making greatly.

7. The Ministry of Business, Innovation and Employment (MBIE) is leading the development of the Strategy. Already, MBIE has met with a wide range of stakeholders and has established a cross agency steering group to guide the development of the Strategy. Feedback from stakeholders and the steering group has informed these terms of reference.

The Wise Response Society has been submitting on the issues we outline above

for close to a decade (see for example[2]), and we are very disappointed that we have not been included in this group. We request that the Society be included in future stakeholder discussions.

Vision, purpose and objectives

8. The ERP outlines the vision and high-level purpose of the Strategy.

- The vision is for a net-zero carbon economy in 2050, where energy is accessible and affordable, secure and reliable, and supports New Zealanders' wellbeing.

The wellbeing we are able to achieve given the constraints we are pointing to, will be nothing like people imagine. Security and reliability, even of electrical supply, is not guaranteed given componentry and resources are needed from outside New Zealand borders to maintain electrical infrastructure.

- The high-level purpose is to address strategic challenges in the energy sector, and signal pathways away from fossil fuels.

The fossil fuel economy is already showing signs of a rapidly growing dysfunction globally. To ignore this reality, and to fail to make plans for a far more rapid transition, will lead to enormous dysfunction in society. The loss of strategic fuels such as diesel will send shockwaves through society as supply chains and food production systems grind to a halt.

9. This Strategy will cover all forms of energy across the motu (both demand and supply side), including electricity, gas, and liquid and solid fuels, and will look out to 2050.

The supply side work must look at energy system dynamics, not just linear projections. A promising approach to consider is the MEDEAS model developed for the EU. It applies a systems dynamics approach that is able to help stakeholders and policy makers to develop a deeper understanding that then flows into strategy work. The Principal Economist at MPI, Dr Marjan Van Den Belt has literally 'written the book', called "Mediated Modelling" as to what this process could look like.

10. The Strategy will have the following high-level objectives:

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2 http://wiseresponse.org.nz/wp-content/uploads/2018/06/Wise-Response-Inc-Submission-on-draft-Productivity-Commission-Report-for-low-carbon-economy-Final.pdf
http://wiseresponse.org.nz/wp-content/uploads/2018/07/Wise-Response-Societ-Submission-on-the-Zero-Carbon-Bill-19-July-2018-Finalb.pdf
http://wiseresponse.org.nz/2021/03/30/wise-response-submission-to-the-climate-change-commission/
http://wiseresponse.org.nz/2015/07/01/wr-submission-to-nz-climate-change-consultation/
http://wiseresponse.org.nz/wp-content/uploads/2017/10/Wise-Response-Submission-Low-Emissions-Economy-Final.pdf
Wise Response Submission to the Infrastructure Commission of New Zealand
Wise Response Society Inc. SUBMISSION TO TREASURY on the LIVING STANDARD SERIES Discussion Paper 18/05.

- energy affordability and energy equity for consumers

Energy is already unaffordable for some sectors of society and is therefore not equitable for all New Zealanders.

- our energy system transitions at the pace and scale required to support a net-zero 2050

Our energy system will have significantly contracted by 2050. Any goal to decarbonise via increased electrification will face scale-up issues related to global supply of minerals and resources being insufficient to support 'renewable' energy growth and demand. There are significant geopolitical issues that will also undermine efforts to transition smoothly.

- energy supply is secure and reliable, including as we adapt to the effects of climate change and in the face of global shocks

It is increasingly unlikely that energy supplies will remain secure and reliable in the near future. Global energy supplies are already stressed, with supply side issues leading to inflation and price volatility.

- our energy system supports economic development and productivity growth aligned with the transition.

See our previous comments re the possibility of achieving these lofty goals. Available energy supply will likely decrease, resulting in economic devolution and significant productivity contraction.

11. At the heart of these objectives are consumers. In reaching the objectives, we need to support and improve wellbeing for all New Zealanders.

The Wise Response Society welcomes the focus on wellbeing which we speak to in our motto: "As demand for growth exceeds earth's physical limits, causing unprecedented risks, what knowledge and changes do we need to secure New Zealand's future wellbeing?". Speaking frankly however, the wellbeing that is possible given the energy supply constraints we face are at a much lower level of energy and material throughput than is currently envisaged. We must have this conversation as a nation, following the lead of global leaders such as the President of Ireland[3], and French President Emmanuel Macron[4].

12. The vision and objectives are illustrated below.

[3] "Climate Action and the Role of Engineers" Speech at the Engineers Ireland annual conference
[4] Macron's forced conversion to energy consumption 'sobriety'

2

13. These objectives recognise the need to balance competing needs and the opportunity to improve on all three limbs of the energy trilemma (equity, security and environmental sustainability) through the transition.

The approach taken here and in the energy trilemma visualisation is similar in the way it errs[5] to the 'triple bottom line approach of environmental economics, in that it tries to 'balance' these factors as 'competing' priorities. The reality that an ecological economic lens brings to the discussion is that there is a hierarchy, with biophysical or geophysical reality setting the boundaries that the other factors must be placed within. Seen in this way, it is apparent that the economy (scale and nature) is to be placed within the available energy flows that we can sustain in the coming decades, and that it is within this economy that we must design pathways that support wellbeing.

Approach to development

14. The Strategy will be developed in two key overlapping phases, as described further below:

- Firstly, exploring what's possible.

The Wise Response society strongly endorses this approach, and commends the process and participants for recognising that we can only work with what is

[5] Strong sustainability for Aotearoa New Zealand - Part 2 - PRINCIPLES: http://bit.ly/2CF3VOI

possible, and that this does not align with the current expectations of our society, given the reality we have outlined above.

- Secondly, charting the path.

To chart a path forward, we strongly recommend that the Transition Engineering 'In Time' process[6] or similar is utilised to allow the desirable end state and 'back-cast' to illuminate the steps we must take to reach it.

Phase 1: Exploring what's possible

15. This phase is about building an understanding of New Zealand's energy potential, limitations, and opportunities. Under this phase, we will:

- explore potential future scenarios for our energy system,

Again, a Transition Engineering approach to critically analysing scenarios is indicated, and is outlined in an example[7] of transportation options for Christchurch. However first and foremost, the supply side futures should inform the constraints within which scenarios can be conceived. This is not as hard as it may seem, as the constraints this imposes reduces the potential solution set markedly, simplifying analysis.

- undertake research into key areas, and

- identify the key issues to address and opportunities to seize.

16. This phase will be underpinned by modelling, research, and analysis of potential different scenarios/pathways for energy demand, supply, prices, and emissions in New Zealand out to 2050.

The supply side trends are in the driving seat and are going to constrain and primarily set the other conditions. As such, and given the lack of supply side modelling to date by MBIE, this should be the priority focus.

17. The development of these scenarios will have regard to:

- New Zealand's emissions budgets out to 2035

- the target for 50 per cent of New Zealand's total final energy consumption to come from renewable sources by 2035

[6] COP26 - IMechE fringe event - Engineering a Stable Climate - Intro to TE - Interdisciplinary Transition Innovation Management Engineering chapter.

[7] The Hydrogen Promise in Transport - Hope or Hype

- the Government's aspirational target of 100% renewable electricity by 2030, and
- the target for net-zero emissions of long-lived greenhouse gases by 2050.

18. These scenarios will explore the energy trilemma to analyse trade-offs and look at how we can make progress on equity, security and environmental sustainability through the transition.