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Engineers for Social Responsibility  
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21 May 2020

Hon. Grant Robertson  
Minister of Finance  
**Parliament Buildings**  
**Wellington**

CC: Hon. James Shaw, Minister for Climate Change  
Hon. Phil Twyford, Minister of Transport & Economic Development

Dear Minister

To get our economy re-started right away, investment in projects that deploy available skills and technology to achieve dependable future returns is required.

To future-proof urgent investment, Engineers for Social Responsibility (ESR) urge all government departments to remain focused on the target of net zero emissions by 2050 and the UN Sustainable Development Goals.

As a group of around 100 engineering members, ESR considers that being knowledgeable in various fields of technology means we have an obligation to society at large to communicate the many opportunities and risks associated with technological development.

We endorse the crucial role of the Climate Change Commission in informing government policy, and the principles for investment outlined in their letter dated 7 April, 2020. To complement this advice, we would also like to draw your attention to the following risks and opportunities:

### **3 technology risks:**

- 1. Believing emissions reduction technology will allow business-as-usual.** Emissions reduction technology cannot achieve agreed emissions reduction targets on its own without wider behavioural changes in the way we meet our needs. For example, carbon capture and storage technology will not overcome its technical and economic challenges in time to singlehandedly solve the problem of industrial emissions. Even successful, road-tested technology must not fool us into complacency. For example, electric vehicles (EV's) will form a valuable component of our transport future - with lifecycle studies indicating they can emit 70% less CO<sub>2</sub> than combustion-fuelled vehicles in countries with

clean electricity generation. However, it is not feasible to replace all of our vehicle fleet fast enough to meet our agreed emissions reduction targets, and doing this would create unsustainable waste streams. EV's need to be supplemented by major investments in public transport, urban re-form, and low-powered vehicles such as e-bikes.

2. **Banking on continued fossil fuel use.** Any infrastructure project attracting current investment must be able to demonstrate clear benefits to a future economy that uses 80% less fossil fuels. If not, the investment is not future-proof for the next 10 years, let alone the longer term. For example, over-investment in roads is a particular risk.
3. **Poor return on investment.** In a post-fossil fuel economy, we will need a clear focus on **energy return-on-energy** invested (EROI), in the same way you are considering returns on financial investments. For example, hydrogen technology is unlikely to achieve an EROI that makes it cost-effective as a large-scale emissions reduction strategy.

## 2 technology opportunities:

1. **Meeting needs with disruptive innovation.** We need to be fearless in re-imagining a carbon neutral society, focusing on identifying basic human needs and how these can be met without reliance on fossil fuels. COVID-19 could be the disruptive trigger-event which shows that people are able to meet their needs in new ways; for example, using communications technology to reduce our carbon footprint for transportation.
2. **Shift projects.** We need projects that will get the economy moving, and also get us moving towards lower emissions. A “shift project” is one that results in downshift of fossil energy use. Investment in shift projects releases value by reducing the energy used in a system and lowering exposure to energy risks.

ESR invites your engagement with the **Convergence for a Carbon Transition 2020-2030** which seeks to be a catalyst for the design and development of shift projects by engineers and business leaders across Aotearoa. We have attached flyers for our training and executive conference programmes for 2020, and commend these to you and the ministries you lead.

We have also developed a list of suggested shift projects, attached to this letter. These exemplify the type of future-proof investment that is necessary as part of any economic stimulus package in the current environment.

Yours faithfully,



Brendan Donnell  
*President*  
*Engineers for Social Responsibility*



Thomas Neitzert  
*Treasurer*  
*Engineers for Social Responsibility*

# Towards shift projects

A “shift project” is one that results in downshift of fossil energy use. Shift projects usually involve innovations in technology, services, IT, or operations. They are often a redevelopment or regeneration of an old system. Although not yet developed to achieve system-wide regeneration, the following ideas represent first steps in that direction.

## 1. 100% Renewable Electricity:

- Support the many wind generation projects that are already consented.
- Consider pumped water storage infrastructure to counter the intermittence of renewables.
- Support funding for community solar farms (plus storage if appropriate) connected to local networks
- Close Huntly power station

## 2. Urban transport revolution:

- Support investment in all major cities, including:
  - Public transport infrastructure – new electric passenger rail systems
  - Further development of cycleways, walkways, and related infrastructure (including fast-tracking of the Northern Pathway from Auckland City to Albany)
  - Support deployment of on-demand EV car sharing services in major centres e.g. through tenders to provide transport services (as used for e-scooters), and procurement/rental of parking facilities.

## 3. Inter-city rail transport:

- Fast-track proposed investments in electrification of rail freight systems. Electrify the Tauranga-Hamilton-Auckland route.
- Bring forward the repair and reinstatement of mothballed regional rail networks (e.g. Gisborne-Wairoa line).
- Invest in high-speed passenger rail services – with Auckland to Hamilton as the first stage.

## 4. Renovate existing buildings:

- Improve building energy standards for new residential and commercial buildings.
- Significantly increase support for energy efficiency and insulation improvements to the residential building stock.
- Incentivise carbon-free heating, and deployment of improved building science technology (e.g. healthy buildings, hygrothermal & solar-thermal analysis).
- Launch a systematic renovation project for public buildings (e.g. 5% of building stock per year), targeting energy consumption of close to zero for public-sector buildings.

## 5. Circular economy and waste recovery:

- Invest in regional recycling and waste recovery schemes across the country.
- Ensure adequate incentives, finance opportunities and research support are in place to encourage investment in recycled construction materials including steel and concrete aggregate.
- Fast-track product stewardship initiatives.

## 6. Forestry and timber:

- Support an integrated domestic timber supply chain from logs to value added products like advanced building materials (e.g. cross laminated timber, CLT) and kit-set housing.
- Improve support for smaller farm-forestry and tree-crop initiatives.

## 7. Sustainable agriculture:

- Support “regenerative agriculture” developments that significantly increase carbon retention in our soils, reduce application of fossil-fuel-based fertilizer, reduce fossil-fuel use for crop cultivation and improve animal (and human) health.



# convergence

## for a carbon transition | 2020-2030

# Executive Conference | 26 November 2020

## date

Thursday 26 November 2020

## overview

Attend this 1-day conference to see real examples of radical path change ideas stemming from the state-of-the-art interdisciplinary new field of "Transition Engineering".

Hear from renowned speakers and submit your questions to our panel of experts.

Prepare to have your current thinking challenged, your perspective of what's possible shifted and your view of future opportunities expanded. This is not going to be like anything you have seen or heard before!

As the CEO, owner or senior manager of a progressive, forward thinking company, you can not afford to miss this year's Convergence for a Carbon Transition.

## who should attend

- CEOs, directors, business owners, senior managers
- Sustainability executives, leaders and practitioners
- Engineers, architects, & related professionals
- Iwi and Territorial Authorities

## transition engineering

Transition Engineering is the new interdisciplinary field relevant to all engineers everywhere, that has been developed to address the challenge of climate change and environmental degradation.

## fee

\$500 including GST  
(see our website for early-bird and other discounts)

## benefit

- Find ways to enable businesses to thrive in the face of future constraints, including the Climate Change Response (Zero Carbon) Amendment Act
- Explore CO<sub>2</sub> reductions beyond carbon off-setting to future-proof industry
- Discover real innovations that will meet the call for urgent and unprecedented action
- Network with others on the low carbon trajectory
- Answer the call for action, identify meaningful change

## venues

- Victoria University of Wellington
- Auckland University of Technology
- The University of Canterbury

## contact us

Contact Thomas Neitzert  
e: [thomas.neitzert@aut.ac.nz](mailto:thomas.neitzert@aut.ac.nz), m: 64 21 798 931

Promotional opportunities are available for sponsors

## registration

Registration available on the Convergence website:  
[www.carbontransition.net](http://www.carbontransition.net)

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# convergence

for a carbon transition | 2020-2030

Transition Engineering, Management & Policy

## webinar series + discovery workshops

### dates

- 6 online training modules, each with 3 x 50min sessions, available now!
- Discovery workshops will be formed so that learning communities can develop "shift projects" (optional)
- Discovery workshops kick off in mid-July, 2020

### course overview

The course provides opportunity for you to work, on your own or as a group, on a carbon emission problem within your industry. Companies are encouraged to form a team of participants. Coaching will be provided. The groups creating the best transition engineering projects as a result of this course will be invited to present their work at this year's Carbon Transition Convergence.

### transition engineering

Transition Engineering is the new interdisciplinary field relevant to all engineers everywhere, that has been developed to address the challenge of climate change and environmental degradation.

This field is now taught in engineering schools globally and includes methodologies to address complex system-based problems.

### facilitators

- Professor Susan Krumdieck – University of Canterbury, Professor of Transition Engineering (course creator)
- Emeritus Professor Thomas Neitzert –AUT
- Professor Alan Brent – Victoria University of Wellington
- Fiona van Petegem – regenerative business consultant

### fee

\$600 including GST

### benefit

- Find ways to enable businesses to thrive in the face of future constraints, including the "Zero Carbon Act"
- Explore CO<sub>2</sub> reductions beyond carbon off-setting to future-proof industry
- Discover real innovations that will meet the call for urgent and unprecedented action

### who should attend

- Engineers, architects & related professionals
- Market leaders, sustainability practitioners
- Iwi and Territorial Authorities

### workshop venues

- Victoria University of Wellington
- Auckland University of Technology
- The University of Canterbury
- Options to join via video conferencing

### contact us

Contact Thomas Neitzert

e: [thomas.neitzert@aut.ac.nz](mailto:thomas.neitzert@aut.ac.nz), m: 64 21 798 931

### registration

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