Comments at the launch of *Improving Buildings, Cutting Carbon* (ed L. Grant, H. Viggers and P. Howden-Chapman)

16 February 2021

Geoff Bertram

Slide numbers

New Zealand's political and corporate elites are only just beginning to grapple with climate change as a serious issue. In this as in many other respects, we live in a country where the

2 successful neoliberal assault on the state has left policymaking in paralysis. To see this paralysis in action in relation to building standards, one need look no further than Nigel Isaac's Chapter 10 in this book.

The paralysis has several facets. Most obvious is our elected leaders' loss of a confident sense of purpose and legitimacy, reinforced by a culture change in the state bureaucracy (under New Public Management) away from a focus on effective delivery of services towards withdrawal from direct engagement (splitting "policy" from "operations") and an ingrained reluctance to act decisively to curb the capture of policy by well-entrenched vested interests.

But neoliberalism was not just a political culture shift – it was a well-integrated and effectively-executed series of concrete measures which have embedded in this country's laws, regulations and institutions a number of strong biases: in favour of "free markets" and against government intervention (except, of course, when the powerful need a bailout); in favour of corporate priorities and against common-law protection of the weak; in favour of the rich and against the poor. In the utopian theoretical world of neoliberal philosophy, perfect competition combines with perfect foresight, complete contracts and no externalities to produce democratic, egalitarian outcomes. In the real world, unregulated markets are slaughterhouses where the strong chop up the weak and Nature is included among the weak.

But in the long run, Nature holds the trump cards, and does not negotiate or compromise.

Climate change is the defining issue of our age, and what to do about it is a genuine problem for a small open economy far from the engine-rooms of global capitalism. Starting from the neoliberal settlement of the 1980s and 1990s, even building a political consensus that the issue is genuine has been hard enough, let alone developing shared vision and joint ownership of proposed policy measures.

3 The book that we are launching today is just one building block for a policy edifice that is still to be constructed. Its message is that we need new laws, changed incentives, better regulation, new technologies, more skilled and innovative people in the construction sector, and underneath all that, public acceptance that we cannot just go on with "our preference for relatively low building standards, light-handed regulation and 'once-over

lightly' remediation of existing buildings". Yet Chapter 7 points out (p.69) "In the commercial sector, design, operation and labour market laws all combine to ensure the delivery of minimum performance".

4

Given that this book is appearing just two weeks after the draft report of the Climate Change Commission[1], and one week after Transpower's *Electrification Roadmap*[2], it's interesting to do a little compare-and-contrast.

5

Take first the question of how important buildings and urban form are for cutting carbon emissions, since this is surely the first question a policymaker will ask.

According to Dowdell et al in Chapter 5 (p.40 citing IPCC data) "Buildings account for more than 40% of global energy consumption and approximately 30% of global greenhouse gas emissions annually."

They then note that "Vickers and others suggest that the built environment (buildings, roads and other infrastructure) contributes nearly 13% of New Zealand's total greenhouse gas emissions and climbs to 20% when the embodied carbon of imported products is included." (p.47)

Baker and Wilson Chapter 8 p.83 say 20% of 60 MtCO2e (= 12Mt) on a "consumption basis":

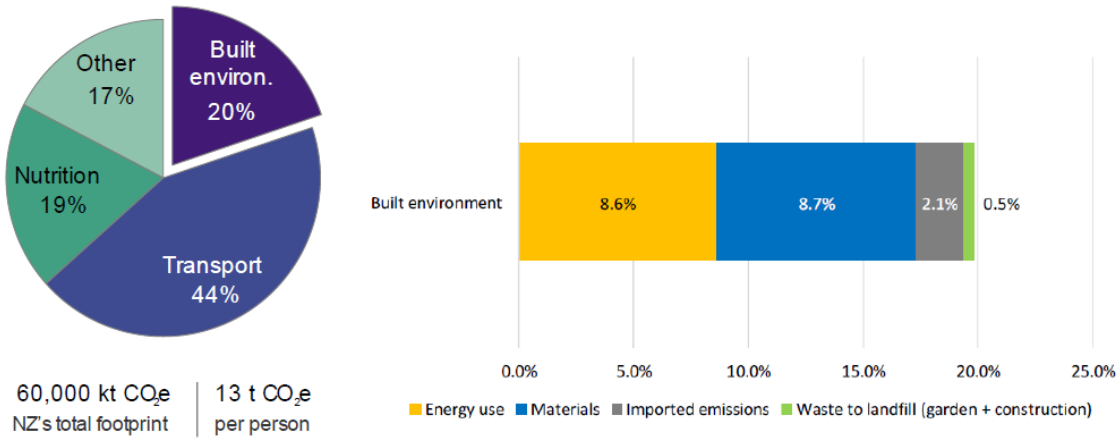

Figure 2. New Zealand's carbon emissions – consumption basis, 2015.
ThinkStep-anz.com, 2018

This would rate the built environment in New Zealand below the global figure of 30% – but presumably this is because half of our emissions are methane from agriculture. As a share of non-methane emissions it looks as though New Zealand is in line with the global average.

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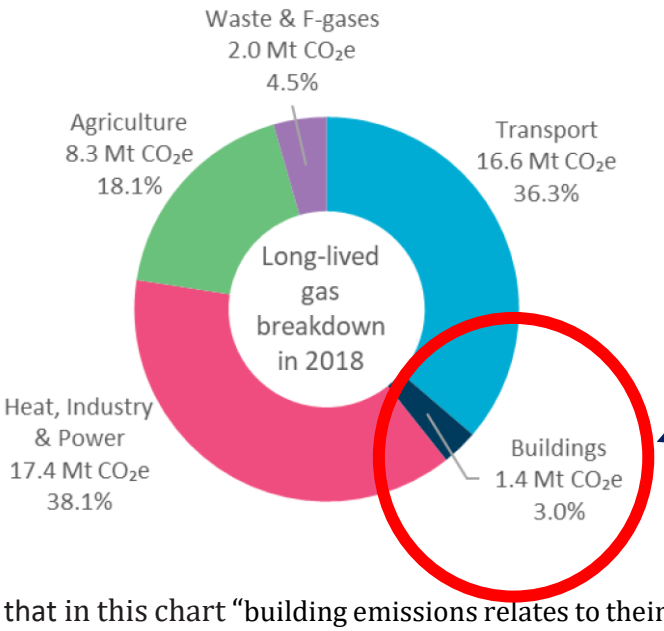
1 He Pou a Rangi/Climate Change Commission, *2021 draft advice for consultation*, 31 January 2021, and *Evidence Report* 1 February 2021, https://www.climatecommission.govt.nz/get-involved/our-advice-and-evidence/ .

2 Transpower NZ Ltd, *A Roadmap for Electrification: Decarbonising transport and process heat*, 10 February 2021, https://www.transpower.co.nz/sites/default/files/publications/resources/Transpower_Electrification%20Roadmap_SCREEN3_LR.pdf

6

But then we turn to the Climate Change Commission report p.28 to see their breakdown of emissions of the long-lived gases (that is, excluding methane):

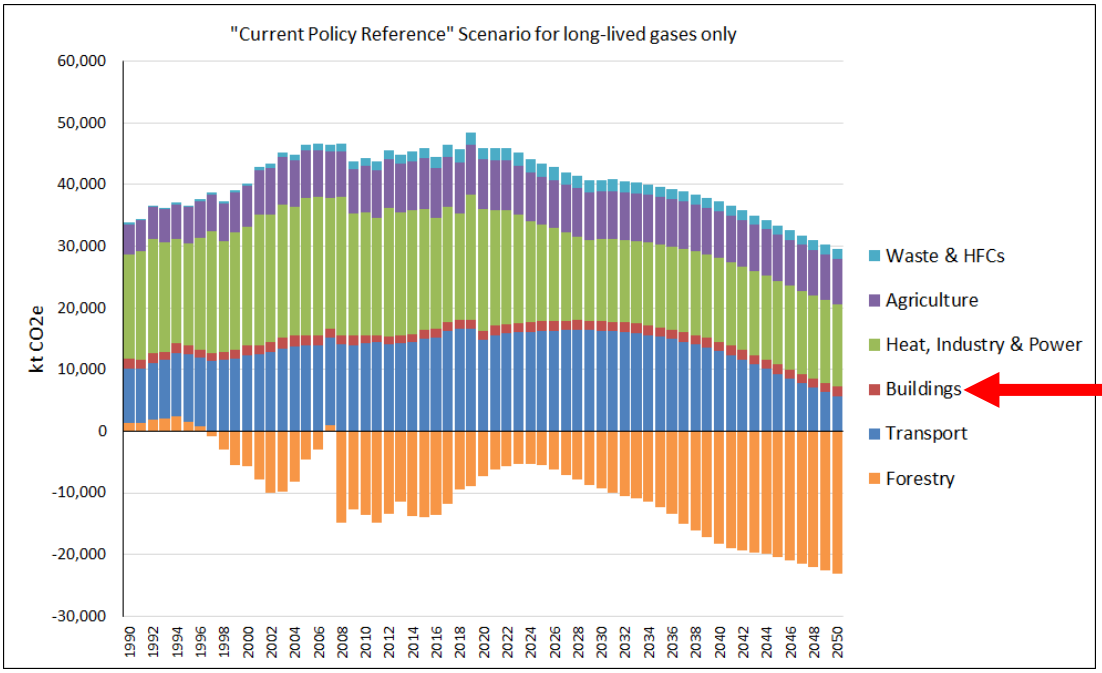


That's just 1.8% of total gross CO2e emissions including methane

The Commission notes that in this chart "building emissions relates to their energy use, but not construction", which removes from view the construction industry's emissions which are buried in "heat, industry and power". I'm just a bystander here, not an active modeller in the space, but it does look to me as though the Commission may be underestimating the importance of buildings and urban form - 3% seems a remarkably small figure.

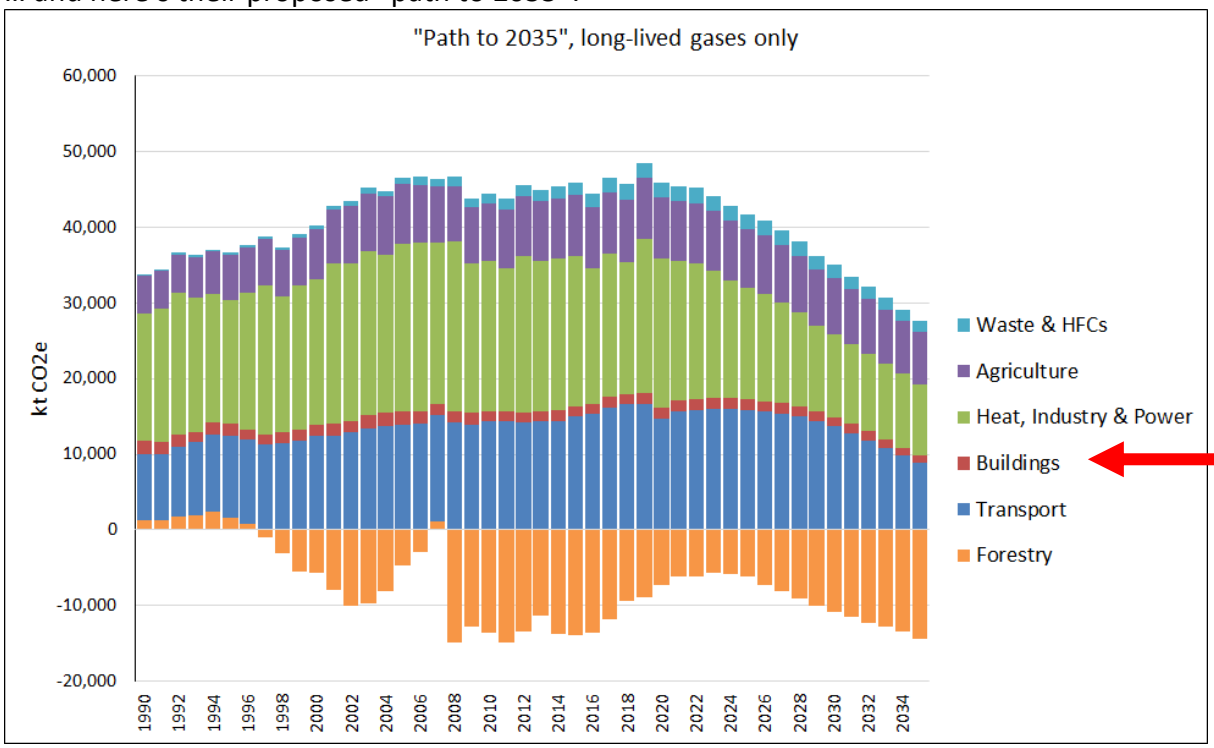
7

Here's the Commission's "current policy reference scenario" for emissions 1990 to 2050



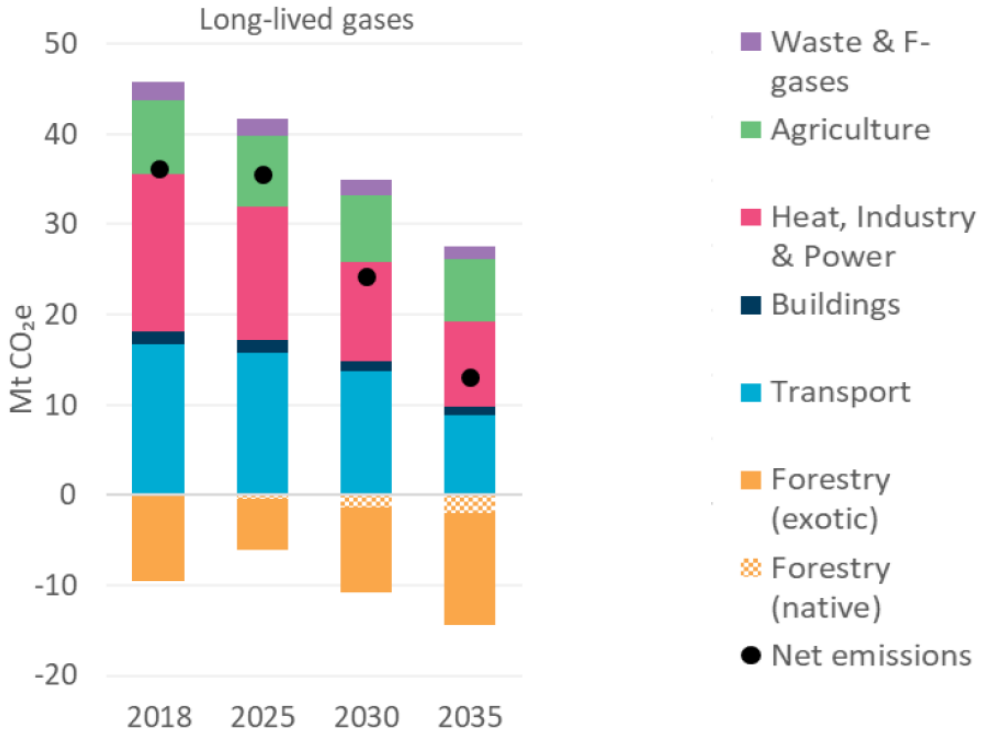
Source: constructed from dataset at https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/2021-Draft-Advice-Report-charts-and-data-v3.xlsx

8 … and here's their proposed "path to 2035":



Source: constructed from dataset at https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/2021-Draft-Advice-Report-charts-and-data-v3.xlsx

9 … and here's their snapshots of long-lived emissions on their proposed path (Figure 3.9 p.57)



The implied message is that "buildings" are a small, low-priority sector in the Commission's thinking. One reason is that they count only energy use in buildings – not construction emissions, embodied emissions in materials, or emission content of energy used. Their number still looks low…

At the same time the Commission has little to say about urban design.

10 The Commission's work programme (pages 25-26 of the draft report) included four "technical reference groups" but none of these was concerned with urban design or buildings. They conducted one single workshop on urban form. The Evidence Report Chapter 4b (on transport, buildings and urban form) is dominated by transport, and has a bibliography in which only one of the authors of the present book (Ralph Chapman) even appear. There's no reference in the text to the work of BRANZ, or Howden-Chapman, or the rest.

That leads me to think that the Climate Change Commission inhabits a separate intellectual universe from the work collected together in this book. The opportunity for quite a lot of cross-fertilisation – mainly from here to there – seems pretty clear.

11 Buildings and urban form do not really figure in the Commission's draft advice. The only really serious specific recommendation is stopping natural gas connections to new buildings, which does not seem to have any thorough supporting reasoning anywhere in the documents and may just be a nod to the electricity industry's dream of eliminating its main competitor.

12 The Commission's urban form recommendations are anodyne (p.117):

Necessary action 10

Reduce emissions from urban form

We recommend that, in the first budget period the Government promote the evolution of urban form to enable low emissions transport and buildings through ongoing legislative reform:

a. **Develop a consistent approach to estimate the long-term emissions impacts of urban development decisions and continually improve the way emissions consequences are integrated into decision making on land use, transport and infrastructure investments.**

b. **Ensure a coordinated approach to decision making is used across Government agencies and local councils to embed a strong relationship between urban planning, design, and transport so that communities are well designed, supported by integrated, accessible transport options, including safe cycleways between home, work and education.**

13 That's in strong contrast to the dramatic carbon-budget calculations in Chapter 8 of this book which show emissions from residential transport as a huge drain on the carbon budget, and conclude that (p.85) "*if unchanged*, consumption emissions from living, working and travel

within the urban environment alone could account for several times over the total net carbon emissions budget. It is clear there is a huge gap between what we are doing and where we need to be."

14

Chapter 8's conclusion is stark: "Buildings are currently several times too carbon intensive (exactly how much depends on modelling assumptions), and their carbon intensity must be reduced. If we do not begin building much more carbon-efficient buildings almost immediately it will be very difficult to reduce the tail of emissions that get locked in. Transitioning to electric vehicles and building train lines will not suffice when it comes to avoiding transport emissions. Bold reprioritisation is needed in transport patterns and urban form and active travel needs to be prioritised."

15

As with urban form, the Commission's recommendations on buildings are limp (p.117):

Necessary action 9

Increase energy efficiency in buildings

We recommend that, in the first budget period the Government introduce measures to transform, transition and reduce energy use in buildings. Measures should include:

a. **Continuing to improve energy efficiency standards for all buildings, new and existing stock, through measures like improving insulation requirements. Expand assistance which targets low-income households.**

b. **Introducing mandatory measures to improve the operational energy performance of commercial and public buildings.**

c. **Setting a date by when no new natural gas connections are permitted, and where feasible, all new or replacement heating systems installed are electric or bioenergy. This should be no later than 2025 and earlier if possible.**

16

Again there is a stark contrast with the vigorous advocacy of zero-carbon buildings in the book's Chapters 2 (global view), 3 (New York experience), 5 (residential buildings) and 7 (commercial buildings):

"we have all the technology and knowhow we need to reach a net zero commercial building stock now and for the long term. It just takes a holistic approach to design, operation and management of buildings and the national electrical grid." (p.80)

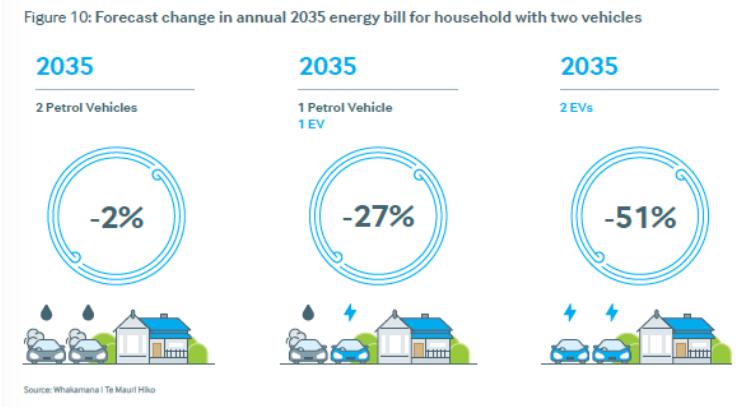
17

This brings me to Transpower's *Road Map for Electrification*, which is built around a different path to decarbonisation. Whereas the Zero Carbon Act, the Commission report, and this book are all directed to increased energy conservation and efficiency across all sectors of the economy as the key to reducing carbon emissions, the electricity industry's vision is to maintain as much as possible of the status quo while replacing all other energy forms with electricity. This means a massive increase in required electricity supply, from which the industry hopes to profit accordingly if all the required investment is stimulated by market forces.

The problem that this highlights is that of trying to achieve big collective goals using the machinery of unbridled market capitalism. The industry's profit-maximising ambitions require that

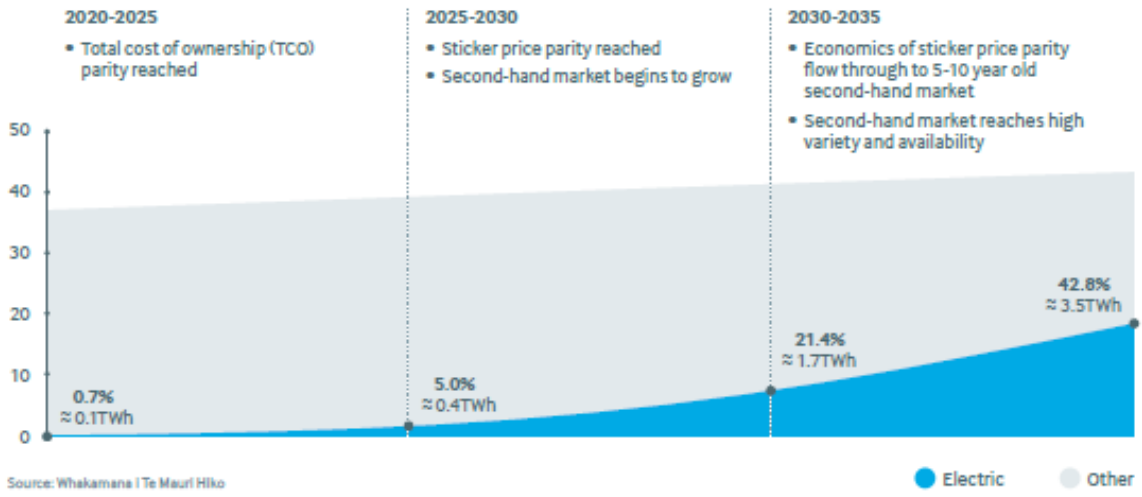
- The economy decarbonises by buying much more electricity
- Economic transformation that reduces electricity demand is unwelcome
- 100% renewable generation of electricity under the current market model would drive down the wholesale price while driving up the amount of required investment, so abandoning or deferring the 100% target is a key industry goal (to which the Climate Commission has been signed up).
- Distributed renewables such as rooftop solar and small-scale wind are potential competitors to the incumbent gentailers and so shutting them out as much as possible is a goal – hence killing the fixed charge regulations is a big lobbying goal.
- The big expansion of wind on which the Commission pins its hopes (Figure 3.14 p.62) remains hostage to the industry's control of the most attractive sites which have been purchased, consented and then held idle for the past couple of decades, and will be brought in only at a rate that doesn't threaten to drive down profits by putting wind on the market margin for long periods.
- If possible the Tiwai Point smelter will be kept open to mop up lots of the available supply and thus hold prices up
- Government is to kowtow to the industry's rent-seeking demands as the price of persuading the cartel to meet the electrification goal.

So Transpower's *Road Map* is focused on electric vehicles and process heat <u>in a business-as-usual setting</u> – for example a two-car household (p.19):



with road travel on its existing growth path p.18:

Figure 9: Light passenger transport distance travelled by fuel type
(Vehicle kilometres travelled, billions, Whakamana i Te Mauri Hīko Accelerated Electrification)



19

Transpower and the electricity industry as a whole want to transform the energy inputs to a relatively untransformed economy and society, with Government forcing the pace of electricity while giving the big electricity corporates more "certainty" and freedom from RMA restraints and leaving the electricity market structure untouched.

20

The Climate Change Commission similarly proposes massive expansion of electricity supply, primarily wind and solar (p.62):

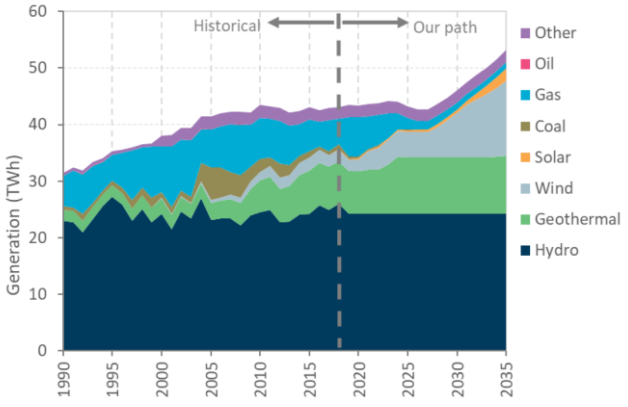


Figure 3.13: Electricity generation by fuel in our path.

Source: Commission analysis.

21

How to chieve this under the current market model with its total focus on profit is recognised to present difficulties, but the Commission never really gets to grips with the problem of harnessing unbridled capitalism to achieve social goals.

22

It's true that the Commission expresses hopes for more independent entry, including rooftop solar, and includes discussion of energy conservation as a substitute for increased electricity use.

But it never suggests transformation of the electricity industry's institutional structure.

23

The book we are launching today takes two important steps into this difficult territory

- First, in Chapter 7 there is a bold argument that moving to 50% of the net-zero target for buildings could save enough electricity to power half Transpower's EV fleet
- Second, Chapter 12 on "unintended consequences of the removal of the low fixed charge regulations", engages directly with the dis-equalising impact of the changes the Government intends to make at the industry's urging, which will both hurt low-income households directly and disincentivise installation of rooftop solar. This chapter is the best critique of the intended regulatory change that I have seen.

24

The big elephant in the room is that the electricity market is broken by design. For the electricity cartel, under the existing market structure climate change policy is a goldmine.

All three emission-reducing programmes published this month leave a crucial part of the decarbonization agenda at the mercy of a predatory, anti-competitive, disastrously unproductive, rent-seeking cartel that relies heavily on unregulated price-gouging of residential consumers. As the industry's biggest single shareholder and dividend recipient, Government loves the dividends and tax receipts, while insisting that its 51% stake in the MMCs confers no control over the industry's profit-driven decisions.

25

The central strategic goal of the corporate electricity industry is to maximise electricity demand while blocking the path to 100% renewables.

- So long as fossil fuels stay in the mix, they are at the wholesale market margin and so set the spot price way above the supply cost of hydro, geothermal and wind
- So long as fossil fuels are on the margin, every increase in the carbon price - whether via the ETS or otherwise - pushes up the price of all electricity, <u>including renewables</u>
- The viability of small-scale distributed generation such as rooftop solar is very sensitive to the price structure facing households: removing the low-fixed-charge regulation is a quick way to kill rooftop solar for a decade. As Chapter 12 of the book says (p.135) "only about half to two-thirds of the number of households that would currently be able to pay off a retrofit in under 10 years would be able pay it off in that timeframe under the CFC regimen."
- The big threat to industry profit is the huge wind resource, but the gentailer cartel has locked up and "banked" the best sites (plus several hydro options)

- Without institutional change, Government policy is hostage to the cartel's stranglehold

26

The last word can go to Helen Viggers in that excellent Chapter 12 (footnote on p.138):

* Although this chapter is titled '*Unintended* Consequences of the Removal of Low Fixed-User Charge Regulations' it is apparent from reading some of the electricity companies' submissions to the Electricity Price Review that the reduction in economic viability of some small distributed generation is an entirely intended consequence for them.

Now go and buy the book.

Slides follow

Comments at the launch of

Improving Buildings, Cutting Carbon

edited by Libby Grant, Helen Viggers and Philippa Howden-Chapman

Geoff Bertram

16 February 2021

VICTORIA UNIVERSITY OF WELLINGTON TE HERENGA WAKA
Institute for Governance and Policy Studies
A research institute of the School of Government

Neoliberalism and policy paralysis

- Paralysis in action: Nigel Isaacs in Chapter 10

- Facets of paralysis
  - Political culture shift: lost confidence and legitimacy of elected leaders
  - New Public Management reduces capacity and inclination for strong policy
  - Legislative and regulatory provisions embed neoliberal biases

- But climate change is the defining issue today, and in the long run Nature neither negotiates nor compromises

The book is a set of building blocks for a new policy edifice

- New law
- Changed incentives
- Better regulation
- New technologies
- More skilled and innovative people in construction
- Public acceptance/support for abandoning
  - “our preference for relatively low building standards, light-handed regulation and ‘once-over lightly’ remediation of existing buildings” (p.15) and
  - the situation where “design, operation and labour market laws all combine to ensure the delivery of minimum performance” (p.69)

Three big publications within three weeks

- Climate Change Commission *2021 draft advice for consultation* (31 January)
- Transpower *A Roadmap for Electrification: Decarbonising transport and process heat* (10 February)
- Grant et al *Improving Buildings, Cutting Carbon* (16 February)
- So some comparisons…

How important are buildings and ‘urban form’ in the climate-change space?

- Dowdell et al Chapter 5:
  - “Buildings account for more than 40% of global energy consumption and approximately 30% of global greenhouse gas emissions annually” (p.40)
  - “Vickers and others suggest that the built environment (buildings, roads and other infrastructure) contributes nearly 13% of New Zealand’s total greenhouse gas emissions and climbs to 20% when the embodied carbon of imported products is included.” (p.47)

- Baker and Wilson in Chapter 8 p.83 say 20% of 60 MtCO2e (= 12Mt) on a “consumption basis”:

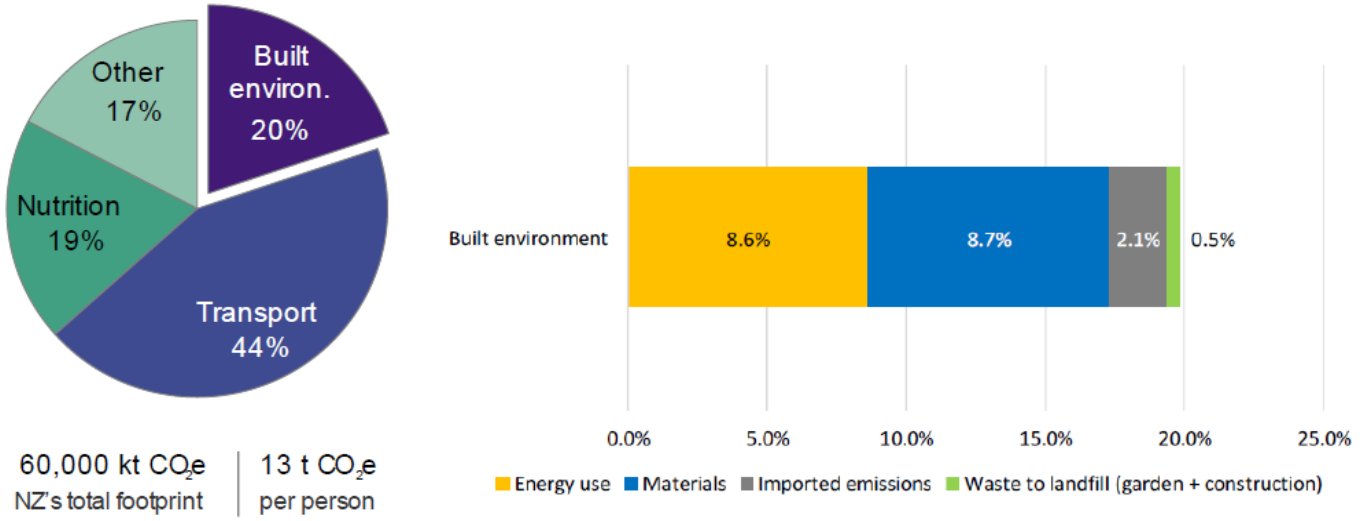
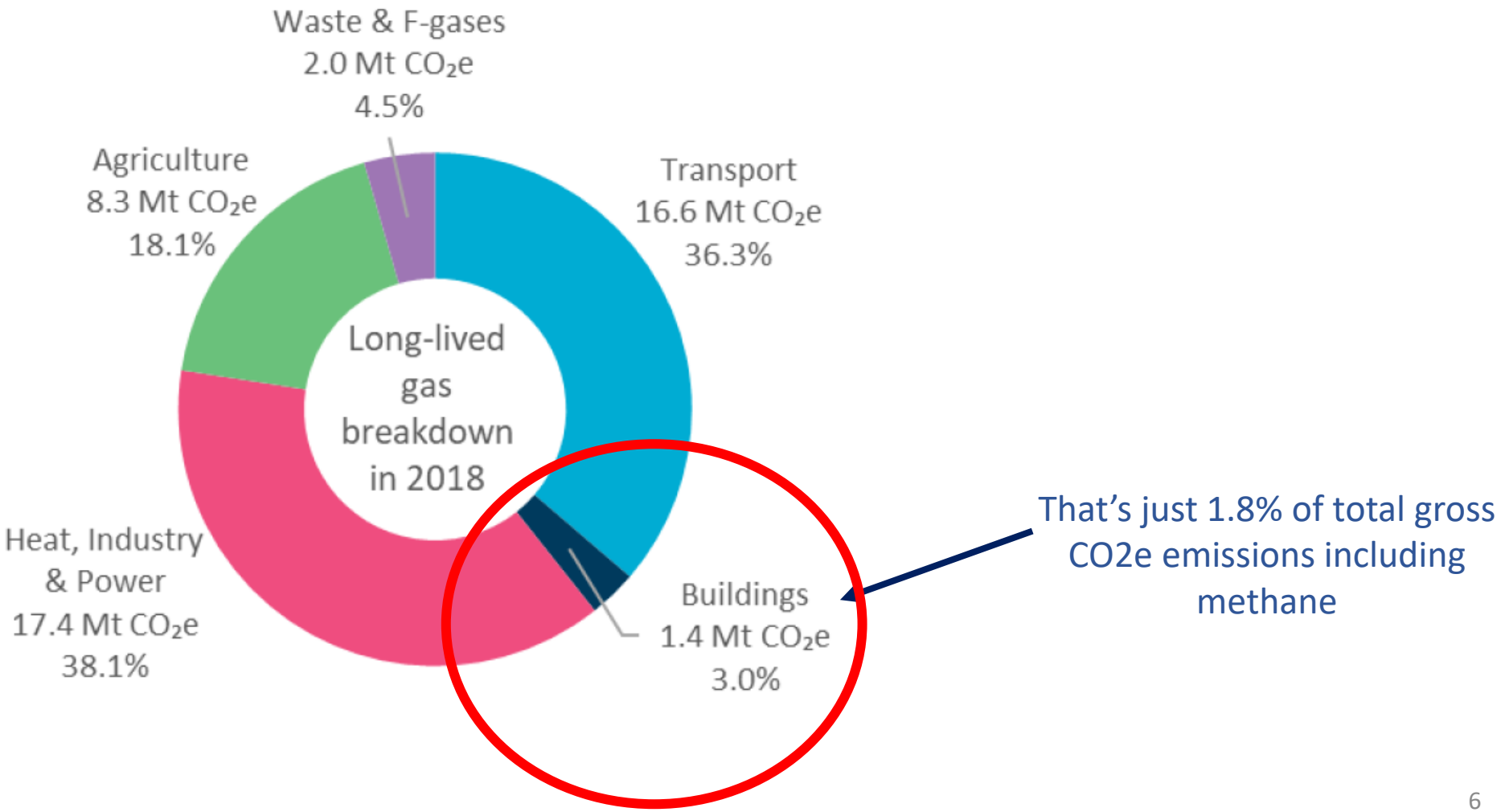


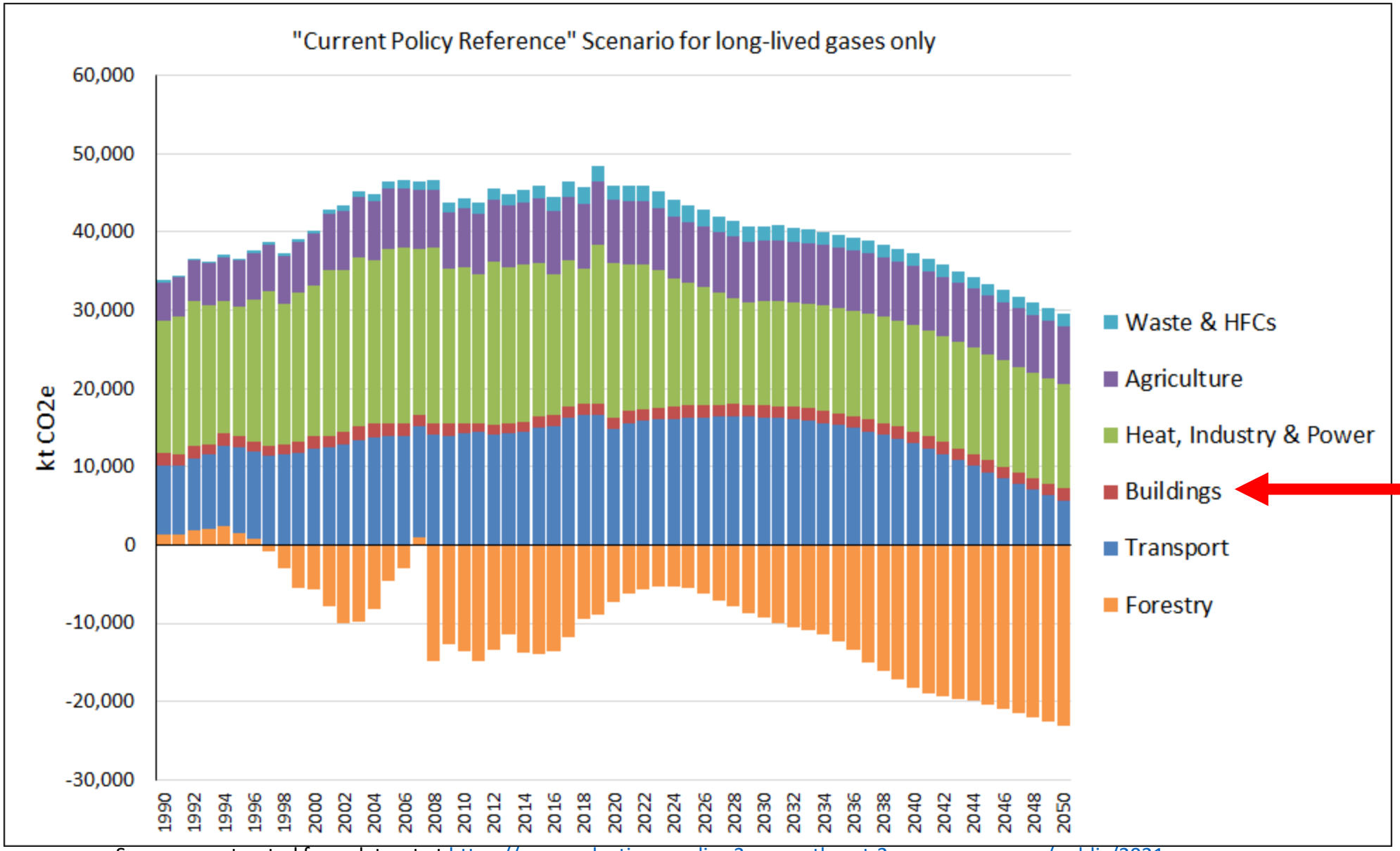
Figure 2. New Zealand’s carbon emissions – consumption basis, 2015.
ThinkStep-anz.com, 2018

But the Climate Change Commission paints a different picture

- Page 28 Figure 2.1 says just 1.4Mt (3%) out of 45.7 Mt of gross long-lived gas emissions:

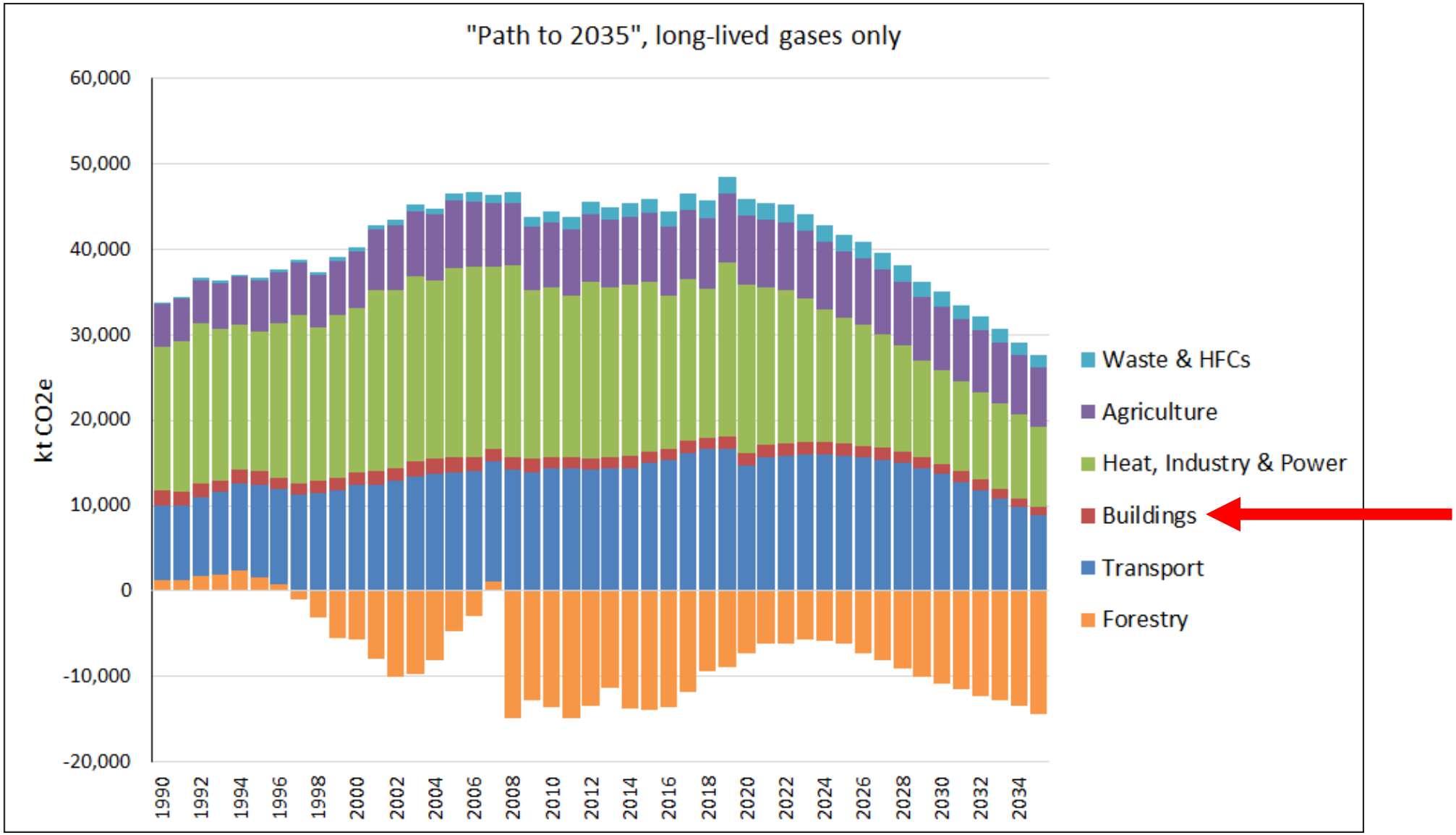


Here's the Commission's "current policy reference scenario" for emissions 1990 to 2050



Source: constructed from dataset at https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/2021-Draft-Advice-Report-charts-and-data-v3.xlsx

… and here's their proposed "path to 2035"



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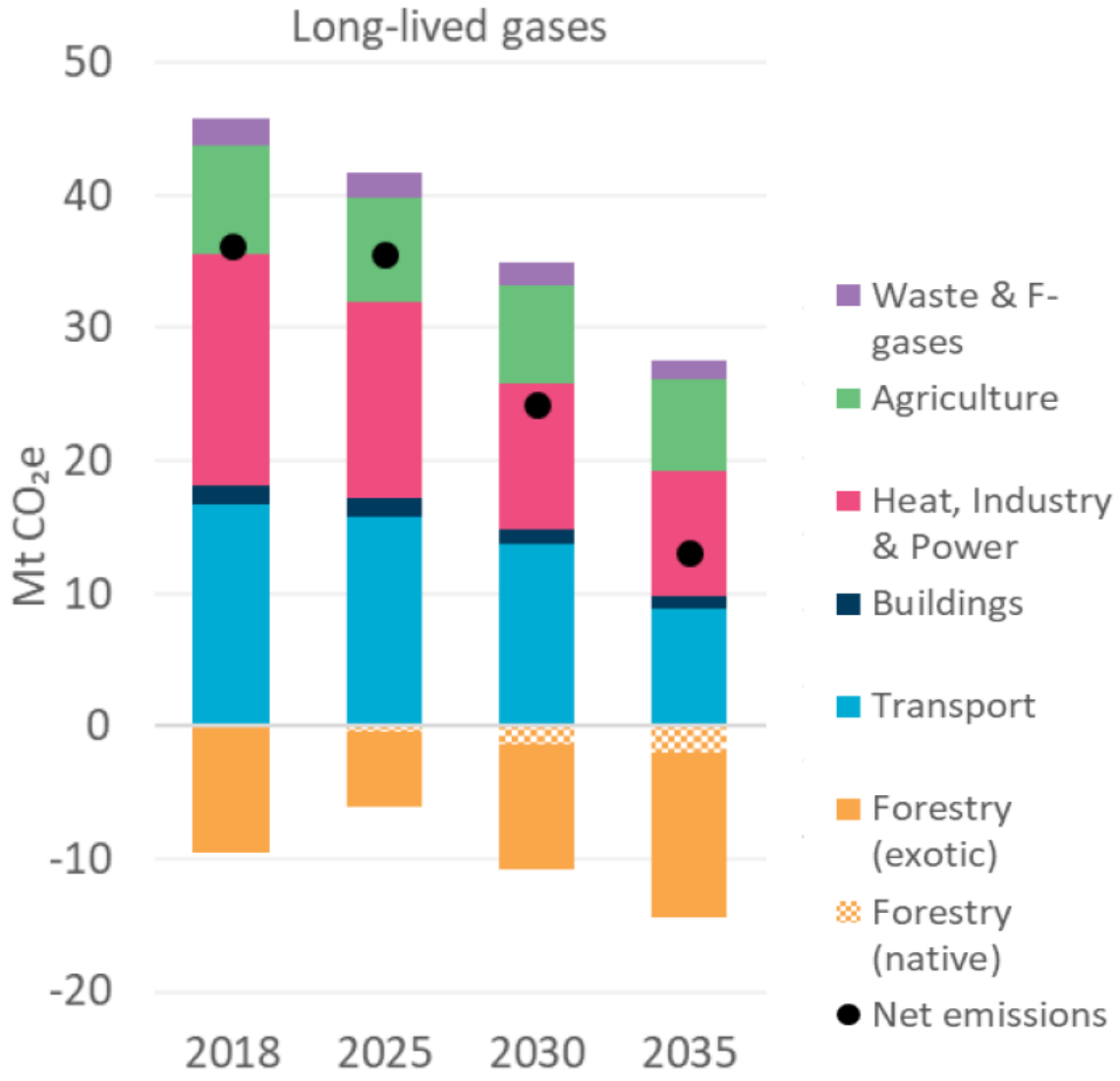

Implied message: "buildings" is marginal and low priority

Reason: only energy use in buildings is counted.
Not construction.
Not emissions content of energy use.
Very little about urban design

But even so this looks too low…

The Commission work programme included

- No “technical reference group” on urban design or buildings
- Just one workshop on urban form
- No citations in the bibliography of Evidence Chapter 4b to any of the book authors except Ralph Chapman
- No reference in the text to the work of BRANZ, Howden-Chapman…

Suggests a separate intellectual universe => scope for cross-fertilisation

Buildings and ‘urban form’ don’t really figure in the Commission’s draft advice

- Three pages in Chapter 7 of the Evidence
- Seven pages of generalities in Chapter 4b of the Evidence
- Two pages (pp.59-60) of the main report, assuming
  - a 6% energy efficient gain by 2035 in existing homes
  - new homes 35% more energy efficient by 2035
  - commercial and public buildings 30% more energy efficient by 2035
- Sidelong comment under “forestry” p.68: “Timber can replace emissions intensive materials such as steel and cement in buildings. This reduces embodied emissions and can lock up carbon for several decades” – but no policy recommendation in Chapter 6
- Page 106 “one of the main ways to decrease reliance on driving is by designing compact communities with the necessary infrastructure to enable easy access to alternative types of transport” – but no “necessary action” recommendation in Chapter 6.
- No specifics on specific policy except for ending natural-gas connections by 2025

Urban form recommendations (p.117):

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Reduce emissions from urban form

We recommend that, in the first budget period the Government promote the evolution of urban form to enable low emissions transport and buildings through ongoing legislative reform:

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b. **Ensure a coordinated approach to decision making is used across Government agencies and local councils to embed a strong relationship between urban planning, design, and transport so that communities are well designed, supported by integrated, accessible transport options, including safe cycleways between home, work and education.**

Contrast that with the dramatic carbon-budget calculations in Chapter 8 of the book …

From page 84:

Figure 3. Approximate national consumption emissions budget, net carbon (after offsets) and other gasses (eg. methane), 2020–50.
ThinkStep-anz.com, 2018

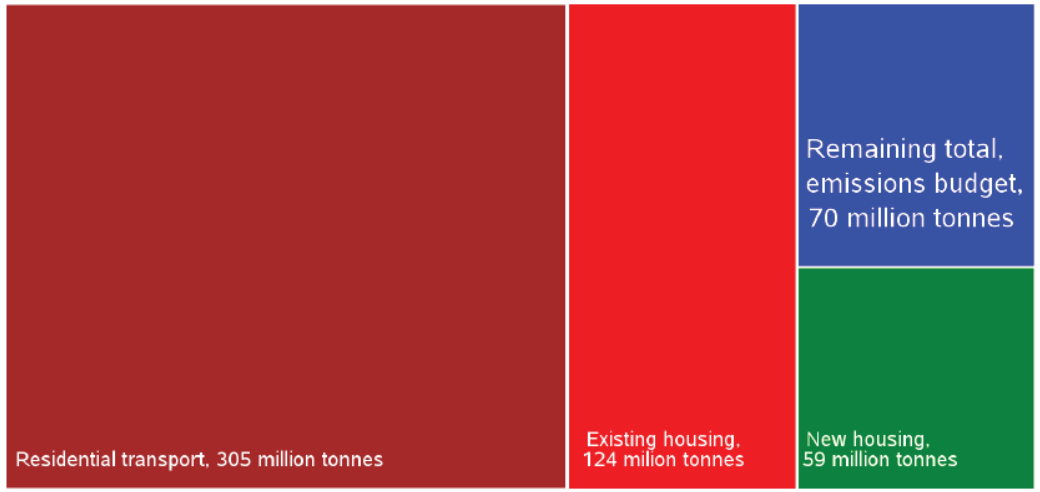

Figure 4. Hypothetical emissions budget for consumption within the residential urban environment.

From page 85:

"Figure 4 shows … that if the *transport* part of consumption carbon emissions did *not* fall from today's level of about 1.9 tonnes per person per year (9 million tonnes per year), cumulative transport emissions alone could be around 305 million tonnes by 2030, exceeding the whole net consumption emissions carbon budget of 178 million tonnes.
…

if unchanged, consumption emissions from living, working and travel **within the urban environment alone** could account for several times over the total net carbon emissions budget. It is clear there is a huge gap between what we are doing and where we need to be." [emphasis added]

…. and the clear conclusions (still p.85):

- “Buildings are currently several times too carbon intensive (exactly how much depends on modelling assumptions), and their carbon intensity must be reduced.

- If we do not begin building much more carbon-efficient buildings almost immediately it will be very difficult to reduce the tail of emissions that get locked in.

- Transitioning to electric vehicles and building train lines will not suffice when it comes to avoiding transport emissions. Bold reprioritisation is needed in transport patterns and urban form and active travel needs to be prioritised.”

Then look at the Commission's recommendations on buildings (*Report* p.117) …

Necessary action 9
Increase energy efficiency in buildings

We recommend that, in the first budget period the Government introduce measures to transform, transition and reduce energy use in buildings. Measures should include:

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b. **Introducing mandatory measures to improve the operational energy performance of commercial and public buildings.**

c. **Setting a date by when no new natural gas connections are permitted, and where feasible, all new or replacement heating systems installed are electric or bioenergy. This should be no later than 2025 and earlier if possible.**

… and contrast that with the book's strong advocacy of zero-carbon buildings

- Definition p.70:

> When extrapolated to retrofitting a whole building stock, the net zero energy ideal is defined as: *A community of buildings which have a greatly reduced demand for energy and:*
>
> - *the building stock only consumes energy from the country's existing carbon-free energy infrastructure (hydro, wind and solar); or*
> - *if it cannot meet the above, it generates onsite at least as much carbon-free energy as consumed from carbon-producing (coal, gas or oil) energy sources.*

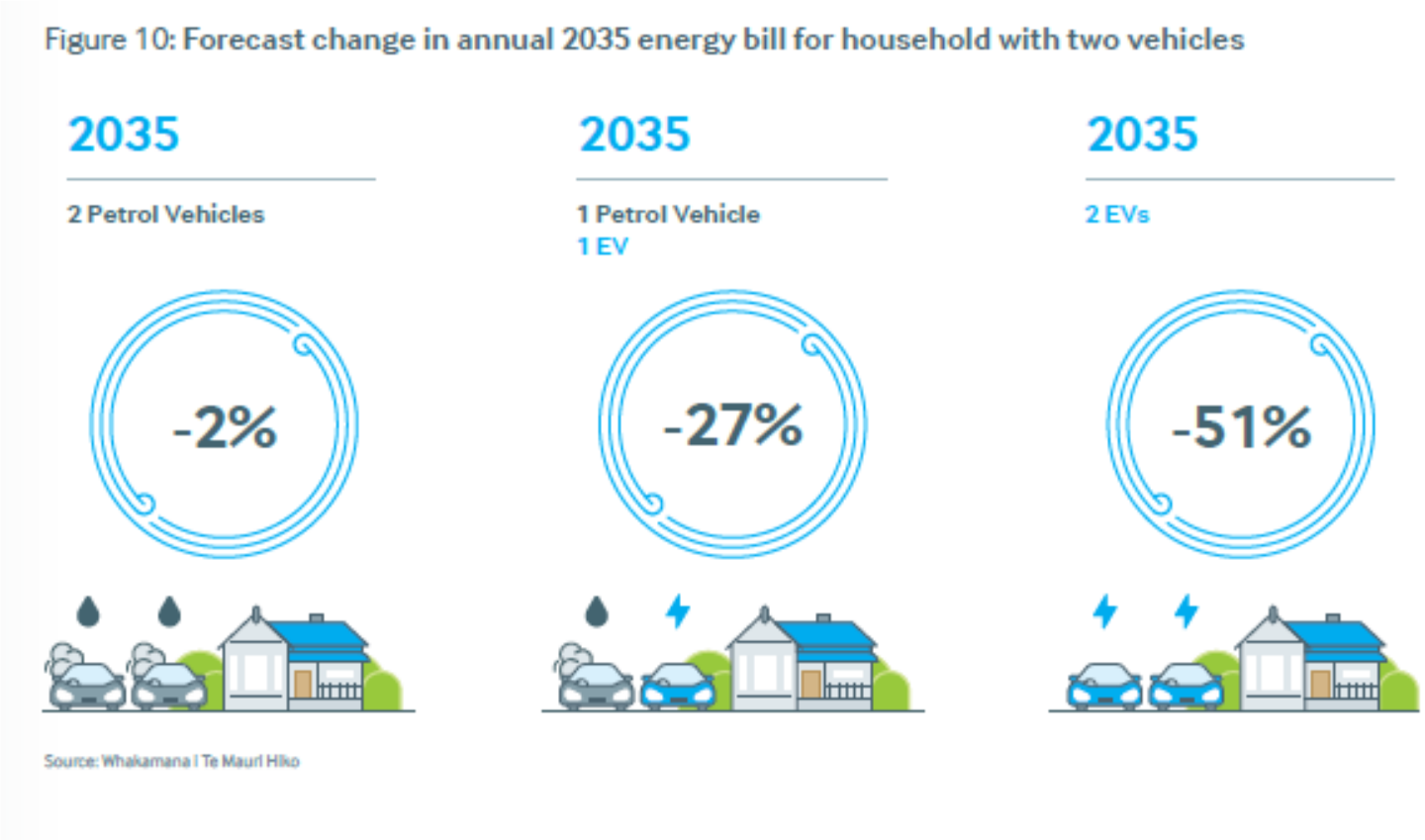
- The zero-carbon concept is central to Chapters 2 (global view), 3 (New York experience), 5 (residential buildings) and 7 (commercial buildings) of the book

- Possibilities p.80:

> "we have all the technology and knowhow we need to reach a net zero commercial building stock now and for the long term. It just takes a holistic approach to design, operation and management of buildings and the national electrical grid."

Final big issue: does decarbonization just mean electrification?

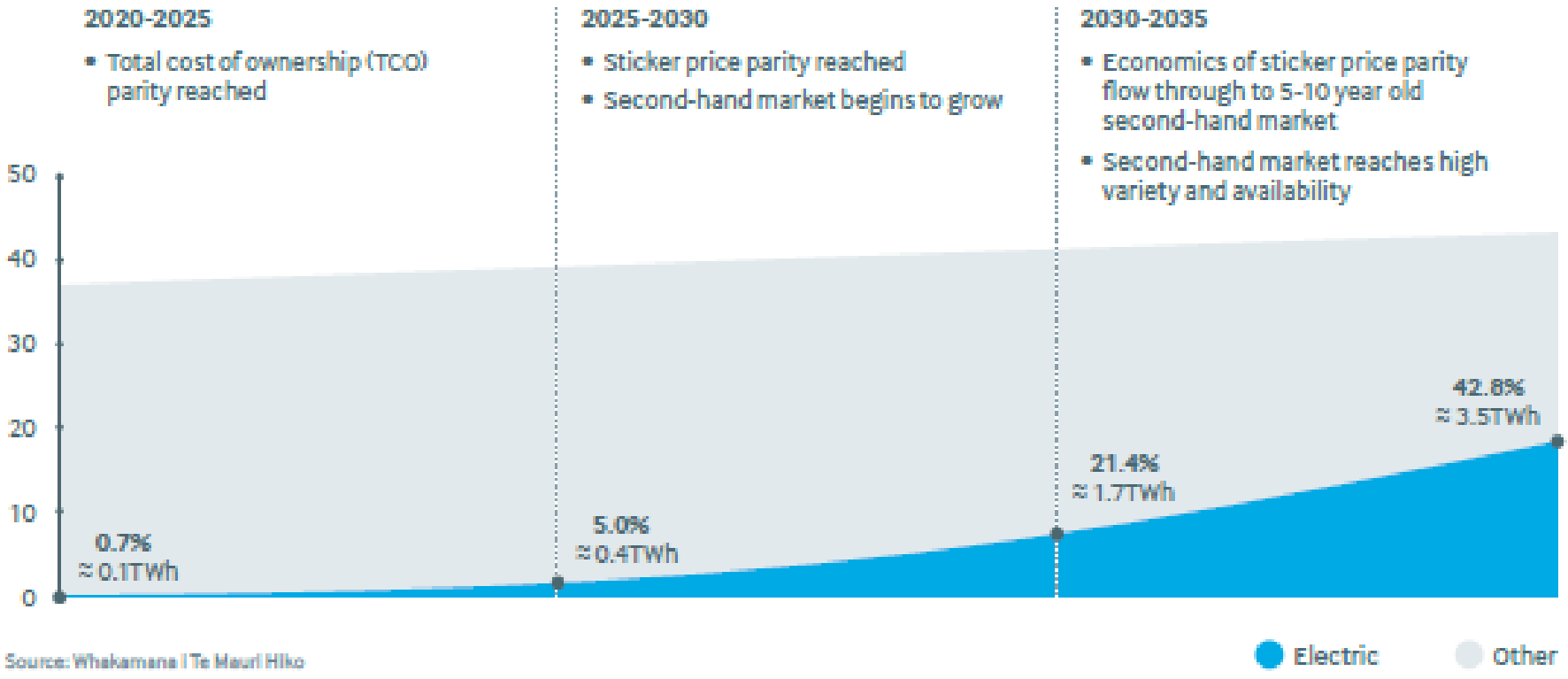
- That's the thrust of Transpower's *Roadmap* which suggests complete electrification of transport and process heat within a business-as-usual economy.
- For example, for household cars, page 19 shows a two-car household:



… and road travel just keeps on its existing growth path p.18…

Figure 9: Light passenger transport distance travelled by fuel type

(Vehicle kilometres travelled, billions, Whakamana i Te Mauri Hīko Accelerated Electrification)



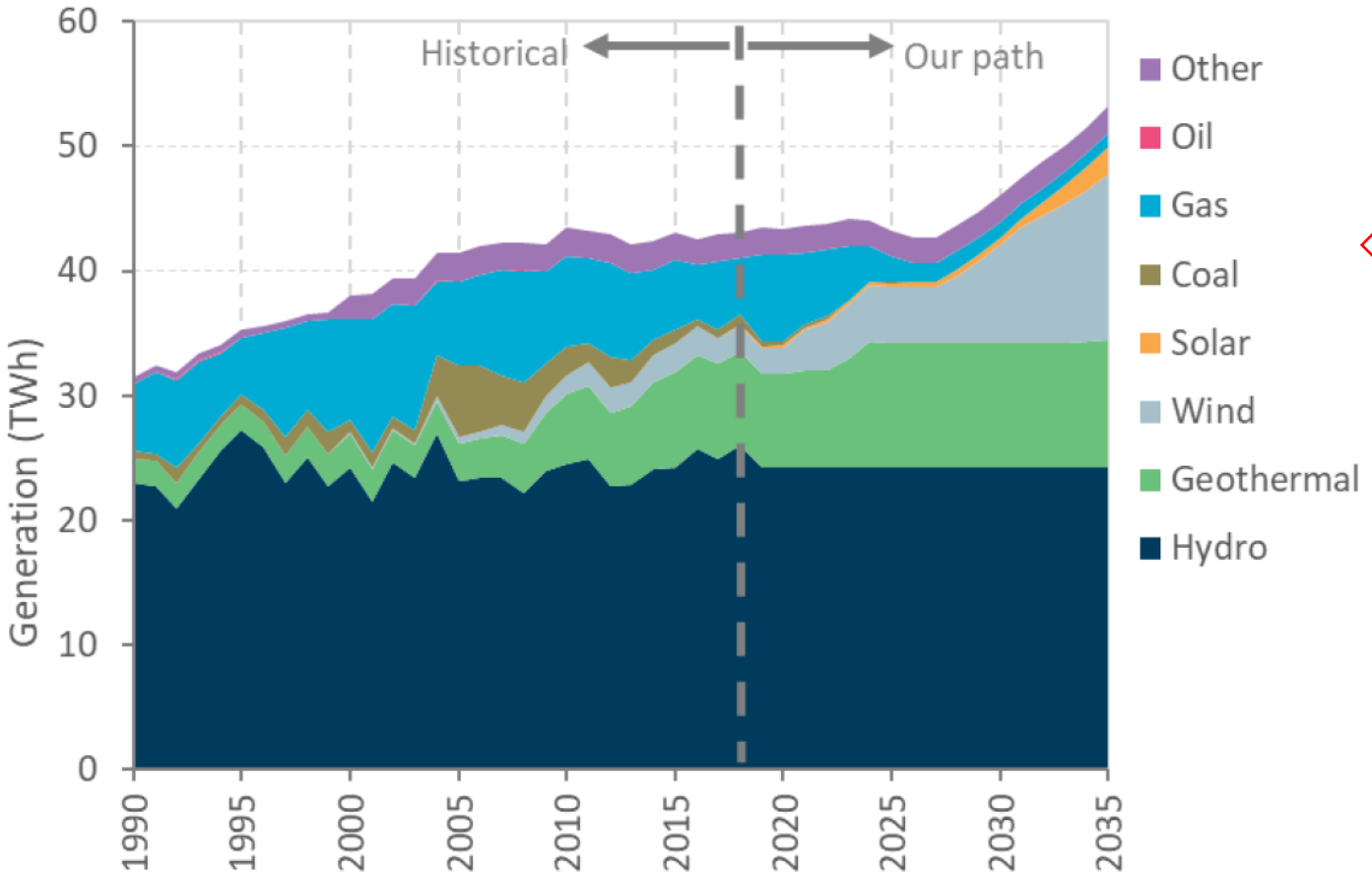
Source: Whakamana i Te Mauri Hīko

… while rail electrification is missing from the *Roadmap*

Transpower and the electricity industry as a whole want to transform the energy inputs to a relatively untransformed economy and society

- So their call is for Government to force the pace on electricity demand by incentivizing EV uptake and process heat retrofitting
- And of course they want “certainty” and RMA reform to encourage profitable generation construction on a large scale
- Also, of course, they suggest no change to the current electricity market set-up, where their profits improve with
  - increased demand
  - reduced costs of consenting and construction
  - preservation of enough fossil fuels at the margin to keep the price up way above the near-zero operating cost of renewable generation
  - an ETS written by and for rent-seekers

The Climate Change Commission also proposes massive expansion of electricity supply …



Wind and solar are the strategic lynchpin

Figure 3.13: Electricity generation by fuel in our path.

Source: Commission analysis.

(Page 62 of the draft report)

… and worries a bit about how to achieve this under the current profit-driven model

- “The challenge is delivering a timely, reliable and affordable build out of the electricity system, while managing the opposing risks of under or over-investing in the system… Over-investment could result in sunk assets or increase the delivered cost of electricity and disincentivise electrification. Underinvestment could delay progress on wider decarbonisation efforts in transport, industry and buildings.” (p.63)

- “Our path shows that annual electricity generation would need to increase by around 20% over 2018 levels by 2035 to meet industry and electric vehicles needs. Wind, solar and biomass would expand at a faster rate than expected under current policy settings to meet the country’s energy needs and replace coal and natural gas (Figure 5.4). The Government needs to ensure the electricity system can reliably generate enough supply as Aotearoa shifts away from fossil fuels and increase its dependency on electricity generation. (p.90)

- “We anticipate a steep increase in demand for electricity as the number of EVs on the country’s roads grows. The industry will need to build more low emissions generation capacity rapidly to meet this. Big changes in demand or supply, like the Tiwai Point Aluminium Smelter closing, create uncertainty in the market that can result in generators delaying investment in new renewable generation. Barriers to rapid electrification will need to be systematically addressed. For consumers and industry to invest and convert to electrification, they need to have confidence that electricity will be available, affordable and reliable.” (p.112)

To its credit, the Commission does hope for more independent entry into generation, including lots of solar, and

- it pushes biomass as well as electricity for process heat
- it notes that energy efficiency is a substitute for increased electricity supply: “electricity is part of a broader energy transition. Alternative options for reducing emissions should be considered, as other actions may have a larger impact for the same cost.” (p.112)
- it argues explicitly for “more independent generation and distributed generation, especially for remote rural and Māori communities, and ensure access to capital for this purpose
- **BUT** it never ever suggests any transformation of the electricity market’s institutional set-up

The book ventures into this territory on two fronts

- Chapter 7 makes a bold demand-side argument that moving to net-zero-emission buildings represents a potential competitor to increased electricity supply (p.69): “If the commercial energy-use portion of the electricity end-uses shown in Figure 5 could be reduced to a level near zero through careful application of energy conservation and appropriate on-site renewable electricity generation, then the electricity used by these sectors could be available for the proposed conversion to electric vehicles by 2030. Even if only 50% of this zero target was maintained to 2050, then this could still ‘supply’ approximately half the required electricity for electric vehicles in the Transpower projections.”

- Chapter 12, entitled “Unintended consequences of the removal of the low fixed charge regulations”, directly engages with the electricity market structure and its regulation: “The price of electricity is a critical cost in low-income households… The regulations binding electricity retailers make a significant difference to these households. The price of electricity is also of concern to householders considering whether to retrofit insulation, efficient heating or small-scale distributed generation. The low fixed charge regulations have been instrumental in controlling the price of electricity for nearly 20 years.” (p.127)

- What follows in Chapter 12 is the best critique I have seen of the deeply flawed plan to abolish the low-fixed-charge regulations

Large elephant in the room: the electricity market is broken - by design

- All three emission-reducing programmes leave a crucial part of the decarbonization agenda at the mercy of a predatory, anti-competitive, disastrously unproductive, rent-seeking cartel that relies heavily on unregulated price-gouging of residential consumers

- As the industry's biggest single shareholder and dividend recipient, Government loves the dividends and tax receipts, while insisting that its 51% stake in the MMCs confers no control over the industry's profit-driven decisions

- For the electricity cartel, climate change policy is a goldmine

The electricity industry's central strategic goal: maximize electricity demand while blocking the path to 100% renewables

- So long as fossil fuels stay in the mix, they are at the wholesale market margin and so set the spot price way above the supply cost of hydro, geothermal and wind

- So long as fossil fuels are on the margin, every increase in the carbon price - whether via the ETS or otherwise - pushes up the price of all electricity, including renewables

- The viability of small-scale distributed generation such as rooftop solar is very sensitive to the price structure facing households: removing the low-fixed-charge regulation is a quick way to kill rooftop solar for a decade. As Chapter 12 of the book says (p.135) "only about half to two-thirds of the number of households that would currently be able to pay off a retrofit in under 10 years would be able pay it off in that timeframe under the CFC regimen."

- The big threat to industry profit is the huge wind resource, but the gentailer cartel has locked up and "banked" the best sites (plus several hydro options)

- Without institutional change, Government policy is hostage to the cartel's stranglehold

I'll leave the last word to Viggers in Chapter 12, final footnote on p.138

* Although this chapter is titled '*Unintended* Consequences of the Removal of Low Fixed-User Charge Regulations' it is apparent from reading some of the electricity companies' submissions to the Electricity Price Review that the reduction in economic viability of some small distributed generation is an entirely intended consequence for them.

Now go and buy the book!