15/9/25

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Submission by Dr Michael Seebeck in response to the Productivity Commission report in regard to renewable energy and "the Net Zero transformation"

BACKGROUND

"Investing in cheaper, cleaner energy and the net zero transformation"

Interim report

Released 03 / 08 / 2025

The PC has been asked by the Australian Government to conduct an inquiry into Investing in cheaper, cleaner energy and the net zero transformation. As part of this work, we have been tasked with identifying priority reforms and developing actionable recommendations.

In this interim report, the PC presents draft recommendations focused on three key policy reform areas:

1. ***Reducing the cost of meeting emissions targets***
2. ***Speeding up approvals for new energy infrastructure***
3. ***Addressing barriers to private investment in adaptation.***

PRODUCTIVITY COMMISSION CHARTER

Service charter

This charter sets out the **standards of service** you can expect when dealing with us. It also briefly outlines our role, values and processes, and steps you can take if you are not satisfied with the quality of our service.

The Commission's role

The Productivity Commission is the **Australian Government's independent research and advisory body** on a range **of economic, social and environmental issues affecting the welfare of Australians**.

The Commission's work covers all sectors of **the economy**. It extends to the public and private sectors and focuses on areas of Australian as well as State and Territory responsibility.

Under its legislation, the Commission performs the following roles:

- holds public inquiries and reports on a variety of policy matters referred to it by government
- **initiates research on economic, social and environmental issues** and reports annually on economic performance, industry assistance and regulation
- promotes public understanding of issues bearing on **community living standards**
- provides the secretariat for the Council of Australian Governments' sponsored review of government service provision, which produces the Report on Government Services, the Overcoming Indigenous Disadvantage: Key indicators report and the Indigenous Expenditure Report.
- investigates and reports on complaints with respect to the Australian Government's competitive neutrality arrangements.
- Its activities are underpinned by effective corporate management and services.

Our values

Building on the Australian Public Service Values, we at the Productivity Commission value:

- the independence of the Commission, **the transparency of its processes and its community-wide perspective**

- working cooperatively with the **wider community**
- **the diversity of views** of those who contribute to our work
- **the intellectual integrity** and commitment of Commissioners and staff.
- The service standards you can expect

We endeavour to achieve **the highest standards** in our public inquiries and research reports.

We will at all times provide a prompt, professional and courteous service.

We will provide sufficient time and information to facilitate public participation in our work.

We will take into account privacy and confidentiality issues while completing our reports within agreed time frames.

EXECUTIVE SUMMARY

The Productivity Commission claims to be the Australian Government's **independent** research and advisory body, as above, but they have provided a report which seeks to **validate government policy *in fast-tracking renewable energy and infrastructure deployment*** under the spurious guise of achieving "Net Zero" emissions targets. This is in no way "independent".

There is utter disregard for environmental issues in their advice to destroy environmental protections in favour of renewable energy, and therefore utter disregard for the climate benefits of intact ecosystems and nature as a whole.

There is utter disregard for the welfare of Australians, many of whom have been and will be impacted by the rapid and reckless roll-out of renewables infrastructure, and utter disregard for many Australians who have a deep connection to and understanding of nature, and have been and will be physically, mentally and emotionally impacted by the destruction of nature for renewable energy as mandated by Australian government policy. This clearly has an impact on "community living standards" as well as the "wider community", values that the charter of the Productivity Commission identifies and supposedly aims to identify and protect.

They also have utter & monstrous disregard for the wildlife which will be injured, killed and have their homes and habitat destroyed in the spurious quest to "reduce emissions".

The Productivity Commission in no way has thus far provided open and accountable research and respected a diversity of views which its charter requires it to do.

The Productivity Commission claims that its research is of the "highest standard". This is clearly not the case.

This report is simply Australian Government propaganda and seeks to gaslight those of us who understand the environmental, biodiversity, biosphere, and ecosystems costs in attempting to achieve unattainable "Net Zero" targets, whilst simultaneously ignoring increasing emissions due to mass immigration, increasing fossil fuel extraction and exports, and approving never-ending environmentally destructive projects of all types, with gross cumulative harms to the environment, remaining biosphere, and the climate.

The Productivity Commission has utterly failed in its charter and has not provided a report which is totally independent and accountable and instead seeks to legitimise government wishes and policy in favour of the rapid and exponentially increasing destruction of nature.

Terms of reference

I, Jim Chalmers, pursuant to Parts 2 and 3 of the Productivity Commission Act 1998, hereby request that the Productivity Commission ("the Commission") undertake five inquiries to identify priority reforms under each of the **five pillars of the Government's productivity growth agenda** and formulate actionable recommendations to assist governments to make meaningful and measurable productivity-enhancing reforms.

Background

Productivity growth is the key driver of real wage growth and **rising living standards** over the long term but has been slowing around the world since the mid-2000s. Australia's productivity growth in the decade to 2020 was the slowest in 60 years.

Several long-standing factors have contributed to the productivity slowdown, including reduced dynamism and competitive pressures, and slower diffusion of technological innovations. Australia also faces new and emerging opportunities and challenges from the changing nature of our economy, including population ageing, rising demand for care and support services, technological and digital transformation, **climate change and the net zero transformation**, and geopolitical risk and fragmentation. How well we position for and respond to these changes will have a significant impact on our future productivity.

In 2023, the Government set out five pillars for a broad and ambitious productivity growth agenda, and it has already progressed significant reforms under each pillar of this agenda. It is now tasking the Productivity Commission to identify the highest priority reform areas under each of the **five pillars** which have potential to materially boost **Australia's productivity growth going forward**, and the measurable impact of these reforms where possible.

Scope of the inquiries

The Commission will conduct five inquiries to identify and report on priority reforms in each of the areas under the Government's five pillar productivity growth agenda. Specifically, these are priority reforms which enhance productivity through:

a. Creating a more dynamic and resilient economy

b. Building a skilled and adaptable workforce

c. Harnessing data and digital technology

d. Delivering quality care more efficiently

e. **Investing in cheaper, cleaner energy and the net zero transformation**

The Commission should have regard to other current and recent reviews of relevance to Australia's productivity performance including the Treasury Competition Taskforce, the National Competition Review and the House Economics Committee inquiry into promoting economic dynamism, competition and business formation; and the objectives and priorities outlined in the Intergenerational Report, the Employment White Paper, the Economic and Fiscal Strategy, the Measuring What Matters statement, and the Government's legislated emissions reduction targets.

The inquiries should identify prospective areas for reform in the coming years, recognising the findings of recent reviews and taking into account Government reforms and reform directions.

Process

The Commission should engage widely and undertake appropriate public consultation processes, including inviting public submissions. The Commission should engage actively with Commonwealth, and state and territory governments.

The Commission's advice should clearly convey the importance of the reform opportunities identified, including quantitative analysis of the measurable benefits of the priority reforms where possible. This could include the long-run economic impacts on GDP and other measures of economic progress and national prosperity, the benefits accruing to Australian households including distributional impacts where possible, or other outcomes such as improved quality of services or living standards. This analysis should be presented in a way which acknowledges and manages the measurement challenges impacting some important reform areas.

The Commission should publish an interim report for each inquiry in the middle of 2025 that includes preliminary actionable recommendations for productivity-enhancing reforms under the relevant pillar. The final reports for these inquiries should include advice on reform implementation, including implementation feasibility and risks, and be provided to Government within 12 months of receipt of this request.

The Hon Jim Chalmers MP

Treasurer

[Received 13 December 2024]

RESPONSES TO SPECIFIC RECOMMENDATIONS:

Reducing the cost of meeting emissions targets

Draft recommendation 1.1

Reducing emissions in the electricity sector after 2030

Governments should prioritise introducing enduring, broad-based market settings in the electricity sector beyond 2030. The settings should:

• create nationally consistent incentives for lowest-cost clean energy, irrespective of generation technology or jurisdiction

• embed investment incentives to ensure reliability and system security are maintained. Governments should also phase out any jurisdictional- and technology-specific incentives over time.

RESPONSE

(1) "Reducing emissions in the electricity sector after 2030"

"Reducing emissions" to the ALP government and the Productivity Commission is fully based on the rapid expansion of renewable energy. The Productivity Commission has in no way scrutinised the effectiveness of this in terms of reducing Australian climate impacts. It seems to be assumed that renewable energy expansion will be beneficial to the climate. This is extremely questionable at best and utterly fallacious at worst. The Productivity Commission claims that its research is independent and of the highest calibre, but what is written in their report in no way reflects his.

The assumption that expansion of renewable energy will lead to lower emissions is completely flawed in that it does not recognise the true nature of climate change, and current overshoot of elevated greenhouse gas concentrations, committed warming and loss of biosphere carbon sequestration and loss of other climate-regulating effects of ecosystems including evapotranspiration, and positive feedbacks, as well as many other greenhouse gasses which are causes of climate change.

The Productivity Commission seems to conform to government narratives and policy, which is based on the assumption that supposedly tackling only emissions going forward is adequate response to climate change.

But it's worse than that. Rapid expansion of renewable energy will not reduce overall emissions, because biosphere impacts are excluded from consideration, and the Productivity Commission has completely failed to identify that population and

economic expansion will undoubtedly increase emissions and loss of carbon sequestration, and negates, any positive impact that renewable energy may have made. Indeed, the Productivity Commission is totally conflicted because it is actually advocating for policies which will increase "productivity", GDP, economic growth, which is in itself an overall cause of climate change in terms of both increased emissions of CO2 and other greenhouse gasses, as well as increasing loss of climate-regulating ecosystems. The Productivity Commission has not identified that fundamental conflict nor has it taken any steps to address and remedy this.

Emissions targets are based exclusively on the emissions of grid electricity. Grid electricity constitutes only 20% of energy demands. The other 80% of energy demands is fulfilled almost exclusively by fossil fuels. Renewable energy targets seek only to address the 20% of fossil fuel emissions caused by grid generation, often at considerable cost to ecosystems and climate regulation. This has not been addressed, indeed, worse than this, the Productivity Commission is now advocating for exponentially increasing environmental destruction by removing what little safeguards there were against ecocide by the renewables industry (see response to other recommendations below).

The Productivity Commission has inherently assumed that renewable energy expansion is of benefit to the climate without looking in detail regarding its negative climate effects. These are summarised:

- Reduction of efficacy of wind and solar farms as more as added to the grid, meaning targets are increasingly difficult to attain, and their emissions and loss of carbon sequestration effects are proportionally increased
- Need for emissions-intensive electrochemical or pumped hydro storage which is never considered in the "fossil fuel replacement" equation
- Biomass loss emissions inherent in ecosystem destruction for renewables generation facilities, with accompanying foregone loss of carbon sequestration, with fragmentation, edge effects, and defaunation.
- Omissions of emissions and environmental impacts of massive amounts of extra electrical infrastructure necessary
- Increasing emissions of balancing fossil fuels necessary for grid stability with VRE

I will address these issues in more detail below:

CLIMATE "BENEFITS" OF WIND ENERGY

Wind and solar energies are essentially the only "climate actions" pursued by the Australian government. The underlying assumptions that their utilisation as climate action are based on are that higher emissions sources of electricity generation are easily and quickly replaced by these technologies. This is entirely fallacious.

To support any electricity grid, electricity generation must be closely correlated with electricity consumption. If there is a significant mismatch between generation and consumption, the grid is likely to fail, causing blackouts, when the frequency rises or falls too much. Similarly, a lack of inertia in the grid can cause failures and blackouts[1], and lack of inertia if often a feature of grids with a high penetration of renewable energy.

Because wind and solar energy are both highly variable and intermittent sources of grid electricity, to replace baseload sources of energy generation, like coal and nuclear, wind and solar energy needs:

- Huge storage capacity – electrochemical and/or hydro to provide enough energy to cover "dark doldrums" and similar weather events
- Massive proportional overbuild of renewables generation capacity to replenish storage and to continue to provide energy when storage is depleted even at times of low wind and absent sun.
- Usually dispatchable energy sources are required because the amount of storage required cannot be realistically provided – eg methane and/or biomass/bioenergy
- Provision of inertia by synchronous condensers

CAPACITY CREDIT

The stated emissions of wind and solar energies are based solely on generated energy, and they assume that all generated energy will be consumed. This is fallacious.

Unfortunately, as more wind turbines and wind farms (and solar farms) are added to any grid, their efficacy falls due to inevitable grid and demand curtailment, which occurs due to their variable generation and the required overbuild[2][3]. This is known as capacity credit and is defined as the ability of renewables generation to replace baseload[4]. Because of this effect, the actual consumed electricity from renewables generation facilities falls with increasing grid penetration. And it is this which should be the basis of

[1] Grid inertia: why it matters in a renewable world
[2] Capacity credit
[3] MEGS: Modelling energy and grid services to explore decarbonisation of power systems at lowest total system cost
[4] FAQ — Output

emissions measurement, as most electricity generated is in fact wasted with high penetration of grids by renewable energy. Baseload generation is completely different; when no renewables are on the grid (that might otherwise take generation preference), almost all generated electricity is consumed.

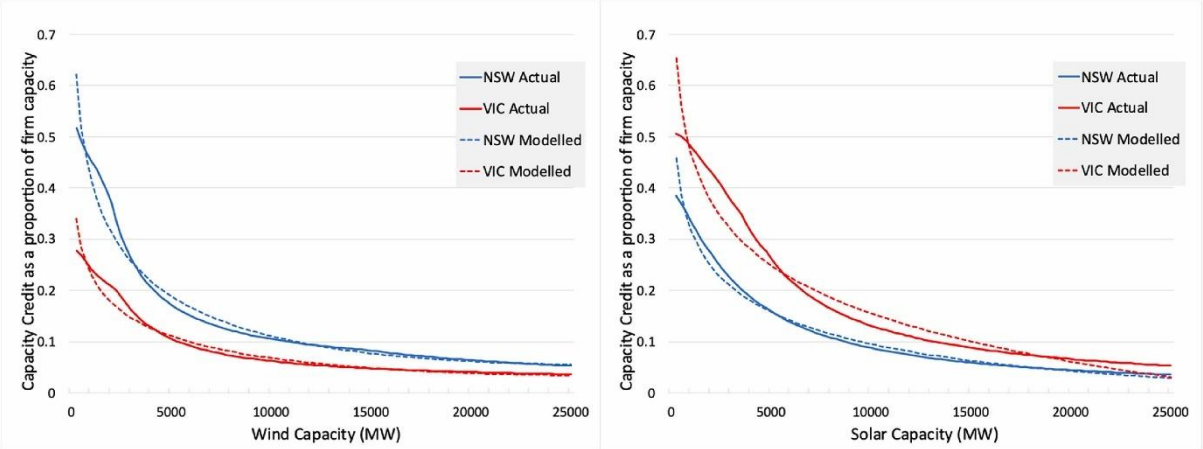


Figure 1 Graphs showing declining capacity credit of wind and solar as more generation capacity is added to their grid - their effectiveness declines and that affects all generation on the grid, not just that which is most recently added

Conventionally the emissions of wind and solar are based on electricity generation, not consumption, and this is just one way the emissions impact of wind and solar is deliberately underestimated. Wind farm operators and governments use "capacity factor" to measure their electricity output. Capacity factor is the mean proportion of nameplate capacity that a wind or solar farm is able to provide or expected to provide - normally around 20-40%. (More accurate is using median instead of mean for skewed distributions – most of the time generation is less than median/mean, but this would not cast renewables generation in a less favourable light.) This assumes all generated electricity is consumed, and this is wrong. A more accurate and realistic measure would in fact be capacity credit which is expected to be only around 8% for wind farms on the eastern Australia grid, with proposed increase of wind and solar[5]. This would mean in itself that CO2 emissions per electricity generation of wind would be 3-5x that stated, and those of solar may be around 3x stated (which is already a gross underestimate – see below).

STORAGE

Because wind and solar require storage in order to attempt to supply a grid 24/7 with less fossil fuel generation, the emissions and environmental impacts of storage should be added to those of wind and solar when comparing wind and solar energies to fossil

[5] Factors influencing calculation of capacity value of wind power: A case study of the Australian National Electricity Market (NEM)

fuel generation. They are not, and this is another source of frank deception on the part of the wind industry and governments.

The emissions of electrochemical storage are variously quoted as 70g – 300g CO2/kWh[6] up to around 659g CO2/kWh for lithium-ion batteries[7]. It is quite possible that higher values are more accurate as they may be more realistic and include more emissions sources that other studies ignore or downplay.

I addition, utility-scale battery storage has a lifespan of only 10-15 years[8][9]. That means it needs to be disposed of and built again within the normal lifespan of wind turbines which is 17.9 years[10], on average, and 15-20 years for the normal lifespan of solar panels in Australia[11]. As the amount of storage increases, the proportion of electricity which will be delivered via storage also increases, and emissions increase further, because the emissions of storage are additional to those of generation. The total amount of electricity supplied via storage is relatively fixed, so the more storage is used to supply electricity, the more quickly storage facilities wear out, and their lifespan is shortened. Generally electrochemical storage only lasts about 400 full cycles, but admittedly newer technologies may improve on that.

In addition, the "roundtrip efficiency" of storage is only 70-80%, meaning that only about 75% of energy supplied to storage can be delivered. This would increase emissions of storage by about 1.33x, as emissions are generally based on electricity delivered back to the grid rather than that which is supplied to replenish storage.

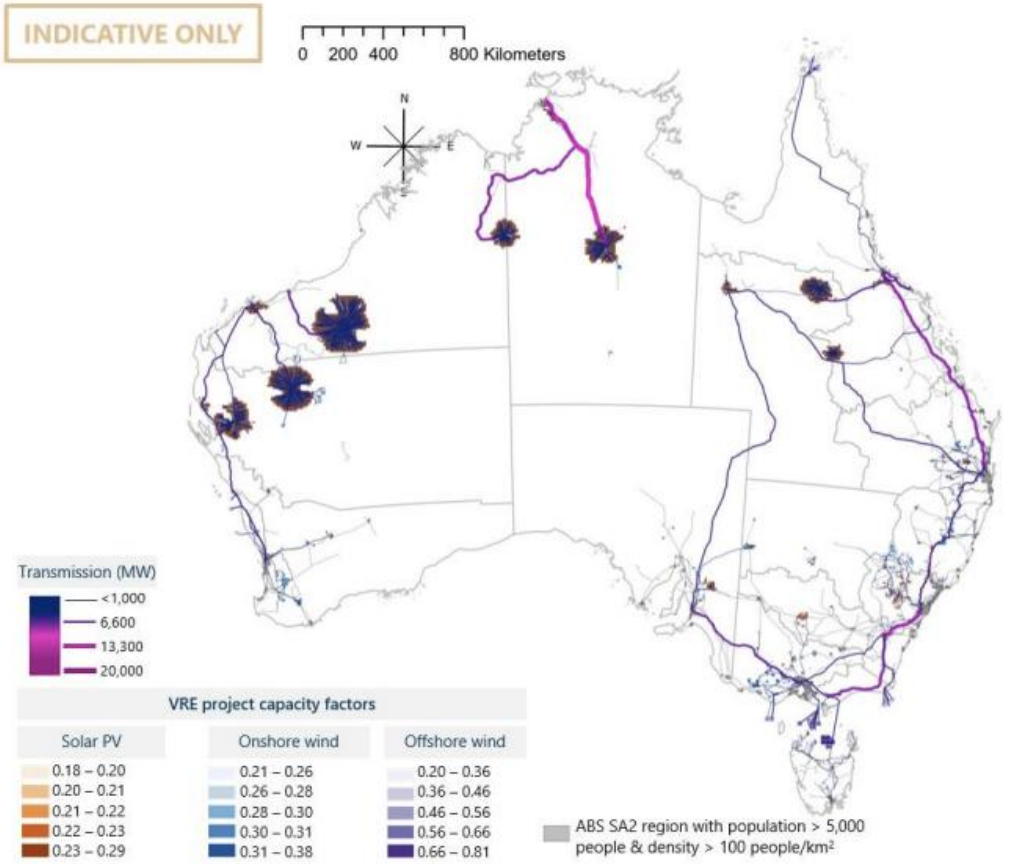
ADDITIONAL INFRASTRUCTURE

Due to the highly dispersed nature of the massively land area-intensive overbuild required to attempt to replace fossil fuel generation with renewables, huge amounts of additional electrical infrastructure are required. This has been projected to be as much as 10 000km[12] of extra high voltage powerlines in Australia by 2050, as well as dozens of new substations, and synchronous condensers. The Net Zero Report identifies the need for 177,000 GW-km by 2050, and 293 000 GW-km of high voltage transmission by 2060[13], giving extraordinary lengths of high voltage power lines, probably at least between 15 000 – 20 000km based on the Net Zero Report, perhaps a lot more. The extra emissions burden of manufacture, assembly, transportation and deployment of this infrastructure is not accounted for in estimates of wind and solar generation. Even the

[6] Estimating The Carbon Footprint Of Utility-Scale Battery Storage
[7] The greenhouse gas emissions' footprint and net energy ratio of utility-scale electro-chemical energy storage systems
[8] Grid Scale Energy Storage: An In-Depth Look
[9] Expected Lifespan of Battery Storage Systems
[10] Statistics on wind turbines in Denmark
[11] Estimating the Lifetime of Solar Photovoltaic Modules in Australia
[12] Energy roadmap lights the way to net zero
[13] Modelling Summary Report – Net Zero Australia 19 April 2023

cables that run between turbines in a wind farm are not normally included in the emissions calculations of wind energy.

Figure 68 | Downscaled electricity transmission and variable renewable electricity (VRE) generation infrastructure for the E+ONS Scenario in 2060.



The emissions of wind energy are deliberately underestimated so as to be portrayed as "low emissions". A fully comprehensive account of all sources of emissions and loss of carbon sequestration would reveal that wind and solar are anything but "low emissions".

Additionally, the new high voltage powerlines often fragment long lengths of remnant forests and other ecosystems[14][15][16]. The emissions of this are again not included in estimates, and should include the emissions of direct biomass destruction, loss of carbon sequestration, and edge effects to 500m distance from the clearing. The climate effects of this alone can potentially end up being massive[17].

[14] Old-growth trees cut down for wind farm
[15] Our case against the Snowy 2.0 transmission lines through Kosciuszko National Park.
[16] Snowy 2.0 power lines clearing 'will despoil' long swathe of Kosciuszko national park, wildlife groups say
[17] Degradation and forgone removals increase the carbon impact of intact forest loss by 626%

WIND FARM CONSTRUCTION

The inherent emissions released in building wind farms in many more remote areas of Australia have never been revealed. Typically, in Queensland, wind farms are being built in remote and rugged areas, often quite distant from population centres. These require a workers' camp and have huge transport emissions resulting from their remote location, a large workforce of fly in-fly out workers, often flying in and out at regular intervals interstate after being transported to the closest regional centre.

Additionally, such environmentally devastating projects require extensive clearing of remnant forests, earthworks, blasting, water trucks, large fleets of small personnel vehicles, and cranes, all running on huge volumes of diesel fuel.

Figure 2 Destruction of open eucalyptus forests by a small part of the Clarke Creek wind farm - concrete batching part on the left, temporary offices on the right, and haulage roads for wind turbines climb the hills on the left after crossing HV transmission.

Assembly of wind turbines requires the transport of wind turbines and other major components from China and Europe by sea, then transport using extremely oversize trucks to the wind farm site. Roads need to be considerably widened, requiring extensive earthworks and blasting, and often causing extensive deforestation along the road margins for tens of kilometres. Assembly also requires the transport of extremely large cranes from Melbourne, and their operations are dependent on thousands of gallons of diesel. Any repair work and decommissioning will also require the same.

Figure 3 Criminal Ecocide at Kaban Wind Farm, Far North Queensland; koalas have been seen here, and ghost bats found

There is never even an estimate given as to what the emissions burden of all this might be. Ideally there should also have been multiple accurate ***retrospective*** analyses of the emissions burden and electricity consumed from wind farms to justify their categorization as "low emissions". This has NEVER been done. Emissions analyses of wind farms are typically based on forward estimates, using optimistic scenarios and ignoring many considerable sources of emissions. We should be asking why we are not seeing more accurate and honest accounts of the emissions and loss of carbon uptake impacts of wind farms, anywhere.

CARBON FOOTPRINT OF WIND TURBINES

Typically, the calculated and stated emissions of wind energy are based almost entirely on the embodied materials carbon footprint of individual wind turbines, and almost all other factors are excluded. Other sources of emissions are typically judged to be

"insignificant" in comparison to the embodied emissions of materials. Typically, scientists who produce the "life cycle emissions analyses" rely heavily on information provided by the wind turbine manufacturers themselves.

There is no independent validation of many factors, for example the emissions of manufacture of the 8000 individual components of wind turbines and their assembly within factories, and the transport of individual components between multiple factories. Transport emissions are judged to be "insignificant" as not provided by wind turbine manufacturers to *scientists*.

"Wind turbines are diverse, both regarding the size of the turbine and the technologies used. As mentioned in the background, there are many different manufacturers, from a lot of different countries all with their own wind turbine models. However, very few companies publish their product data and information is hard to acquire. Furthermore, the few companies that do publish their product data have structured their reports very differently. This raises an important subject, which is the lack of standardisation of reporting in the wind power sector. Due to a lack of consensus in how to apply the ISO standards, it was unreasonable in many circumstances to make a comparison between the different LCA reports and EPDs.

The data collected is in large part limited to one manufacturer (Vestas) regarding both material and energy use. This is because other manufacturers, unlike Vestas, do not provide the same comprehensive data. Even though Siemens Gamesa and Goldwind provided some information, they publish it through an EPD which makes it difficult to access specific data. Also, the differences in how the ISO standards are applied for system boundaries makes their results non-comparable. Therefore, only one manufacturer was considered in the climate impact model. While this limits the accuracy of the overall result, because Vestas is the world's largest wind turbine manufacturer, the results should still be representative of wind energy as a whole.

While Vestas LCAs provided detailed information, their reports were only made for onshore wind farms. Because Vestas does not have any LCA reports for an offshore wind farm, to model the offshore turbines, multiple assumptions were made. From the available LCA reports, the two largest models, that also utilises PMSG, was used for the offshore model. However, they are not designed for offshore applications and therefore modifications in the material and energy usage for the foundation was made to better fit the offshore case where it was assumed that a monopile foundation was used."[18]

Typically analyses cite data straight from the manufacturers, as does the NREL, as it does not have the capacity nor the will to independently verify the data provided by manufacturers, and acts as a scientific lobbyist for the renewables industry:

[18] Climate Impact of Wind Turbine Production

"Citing data from the likes of National Renewable Energy Laboratory, Vestas, Siemens Gamesa Renewable Energy, and Bernstein estimates, Venkateswaran determined that the biggest contributors to the carbon footprint of wind turbines are steel, aluminum and the epoxy resins that hold pieces together — with the steel tower making up 30% of the carbon impact, the concrete foundation 17% and the carbon fiber and fiberglass blades 12%."[19]

Relying solely on industry-provided data for environmental impacts is problematic because it lacks transparency and can be biased, as companies may not fully disclose negative impacts or may present incomplete information to protect their competitive advantage or reputation. Industries also face unique pressures to grow and innovate, sometimes leading to increased, not decreased, environmental footprints, creating a conflict of interest when assessing their own impacts.

Generally, innovation in the renewables industry is focussed on increasing energy output, to provide increased profitability for their customers. The environmental costs of innovation are externalised, and not considered, when manufacturers are fully awara that they are able to easily sugarcoat and present data in such a way as to diminish perceived impacts, or not provide data at all.

Indeed, renewables companies are actually heavily incentivised to lie about environmental impacts, as the marketing of this industry is based almost entirely on perceived environmental impacts, in marketing "green energy" and "clean energy".

There are many examples of companies where investigations have found that they lied and greenwashed regarding impacts; for example, "*Examples of companies lying about environmental impacts, a practice known as greenwashing, include Volkswagen's "clean diesel" cars equipped with software to cheat emissions tests, Ikea's sourcing of wood from illegal logging operations, Keurig's false claims about K-cup recyclability, and H&M's misleading "sustainable" clothing claims. Other industries and companies have been found to make false or misleading claims regarding sustainable fashion, carbon-neutrality in events, and even investment strategies, according to The Sustainable Agency*."[20]

And these are only the companies which have been caught regarding greenwashing and other deceptive conduct. I'm not stating that renewables companies are definitely lying about their emissions and environmental impacts, but circumstantial evidence and the lack of rigorous oversight and accountability suggests that they very well could be.

Using European Community data, as presented in this table and previous versions of this document by the same authors, I have calculated the average carbon intensity of

[19] How Green is Wind Power, Really? A New Report Tallies Up The Carbon Cost Of Reneweables
[20] Greenwashing: 20 recent stand-out examples

wind turbines to be around 900t CO2/ MW, with some variability both with wind turbine technology type, and also variability of stated embodied emissions of various materials; where discrepancies existed, I attempted to use a median value as much as possible.[21]

Table 4. Material intensity estimates for wind turbines, in kg/MW, per wind turbine type.

Material	Range	Type C GB-DFIG	Type D-EE DD-EESG	Type D-PM DD-PMSG	Type E E-PMSG	Type F F-SCIG
Concrete	300 000 - 500 000	400 000 ± 100 000				
Steel	90 000 - 130 000	110 000 ± 20 000				
Aluminium (Al)	150 - 1 900	1 400 ± 500	150 - 500	550 ± 150	1 400 ± 500	1 600 ± 150
Chromium (Cr)	410 - 510	460 ± 50				
Copper (Cu)	650 - 6 200	800 - 1900	5 700 ± 500	2 200 - 4600	900 ± 250	850 ± 150
Iron (cast) (Fe)	16 000 - 22 000	19 000 ± 3 000				
Manganese (Mn)	650 - 950	800 ± 150				
Molybdenum (Mo)	90 - 110	100 ± 10				
Nickel (Ni)	370 - 490	430 ± 60				
Zinc (Zn)	5 150 - 5 750	5 450 ± 300				
Polymers	3 900 - 5 500	4 700 ± 800				
Glass/carbon composites	6 000 - 9 000	7 500 ± 1.500				
Boron (B)	0.2 - 7	0.5 ± 0.3		5 ± 2	0.8 - 1.8	0.3 - 1.2
Dysprosium (Dy)	1 - 21	2 ± 1		17 ± 4	4 ± 3	1 - 4.7
Neodymium (Nd)	6 - 210	12 ± 6		180 ± 30	50 ± 20	7 - 34
Praseodymium (Pr)	0 - 35	0		35	4	0
Terbium (Tb)	0 - 7	0		7	1	0

I calculated the end of life emissions of a wind turbine in typical Australian conditions. I state “end of life” because that figure is actually only reached at the end of life, when the expected energy generation has occurred. Early in a wind turbine’s life, the carbon footprint is much higher and dependent on its age, as the emissions are mainly upfront and released into the atmosphere before any electricity is generated.

Inputs (typical Qld):

Lifespan = 17.9 years

Output depreciation rate[22] = 1.6% per year

Energy unavailability rate[23] = 11%

[21] Deep dive on critical raw materials for wind turbines in the EU
[22] How does wind farm performance decline with age?
[23] Wind turbine availability: Should it be time or energy based? – A case study in Ireland

Carbon footprint = 900t CO2/MW.

Capacity Factor (mean) = 29% (based on current average capacity factors in Australia)

Calculation: Total embodied emissions = 900 000 000g CO2

> Total electricity output = 17.9 (years) x 8760 (hours) x 1000 (MW to kW) x 0.29 (CF) x 0.865 (output depreciation midlife) x 0.89 (unavailability)
>
> = ~35 000 000 kWh.

Therefore, end of life carbon footprint based solely on embodied materials emissions of turbines =

900 000 000/35 000 000 **= 25.7 g CO2/kWh**

This is more than double what is conventionally accepted as the emissions of wind energy of around **11g CO2/kWh** as per the IPCC report (2014), and remember, the above calculation is based on wind turbine embodied emissions alone. That report considered multiple published life cycle analyses of wind energy and simply derived a median figure to arrive at their stated emissions. There was no analysis as to why the included reports gave widely varying figures of around 6g CO2/kWh to 80g CO2/kWh. They were all accepted as accurate despite hugely varying methodologies and inclusions of what were accepted as emissions sources.

Indeed, other reviews have identified emissions between 7.9 and 123.7g CO2/kWh[24]- the authors of this review stated "*It is difficult to see that the higher figures describe the same concepts as the lower ones*." There are major differences in how carbon footprints are calculated and their underlying assumptions. There are also major differences in how energy output is calculated:

"*LCA results are generally presented as an environmental impact expressed per kWh of produced electricity. Energy performance is also highly dependent on the energy production. This makes the estimated energy production have a huge impact on final results, since everything is expressed in relation to the produced electricity. Basically, a doubling of the production of electrical energy cuts an apparent emission in half and makes the energy performance twice as good.*

The amount of electricity that will be produced depends on many factors such as wind class, wind speed, rotor size, turbine power rating and distance to grid. Naturally the actual wind resource at a specific site is a very important factor. Different types of sites can be divided into different wind classes based on average annual wind speed, extreme wind gusts and turbulence (Vestas, 2011). Modern wind turbines are in fact

[24] A review of life cycle assessments on wind energy systems

designed for certain wind classes, and Vestas (2011) suggests that comparisons should only be made between wind turbines within a specific wind class.

In this paper, turbines of different sizes and types that are evaluated in different ways are compared to each other. What we wish to do is not to compare different turbines to each other, but rather compare different methods to assess environmental impact and energy performance of wind turbines. The methods used to estimate the annual production of electricity of a wind farm varies significantly between the different studies. To be able to compare estimated production, the conceptual capacity factor is used, which is the ratio between the energy actually produced and the energy possible to produce if running at rated power all the time. Consequently, comparisons are far from trivial and the simple analysis done here does not go into any detail but rather attempts to pinpoint some underlying differences among the reviewed studies.

Lenzen and Munksgaard (2002) reviewed many energy and CO2 assessments performed since the 1970s, and found capacity factors ranging from 0.08 to 0.50. Modern wind turbines typically lie between 0.20–0.35. In the reviewed assessments, the capacity factors ranges between 0.19 and 0.53 (Table 3). Not all the reviewed studies express a capacity factor, so for some of them a capacity factor have been calculated from given production or assumed full load hours.

Some of the reviewed studies use measured data from actual wind farms while others use more theoretical quantifications of the electricity production (Table 3). For example, Garrett (2011) states that Vestas (2011) use sophisticated real-time diagnostic tools and sensors, operating on around 20 % of global installed wind capacity, which measure individual turbine performance, power output and health status (such as fatigue loading and turbine condition), as a base for quantification of production of electricity for the turbine operating in a certain wind class. In contrast, other assessments have more or less well-motivated assumptions for electricity production.

White (2006) and Ardente et al (2008) assess actual existing wind farms and use actual measured production data of the specific location and turbine type. In both cases, actual production data is significantly lower than expected. White (2006) compares projected capacity factors for three wind farms with measurements, which were significantly lower. ***The projected capacity factors were 0.33, 0.35 and 0.31, while the actual capacity factors were 0.26, 0.29 and 0.20 respectively. Ardente et al. (2008) finds the actual capacity factor measured over a year to be 0.19 compared to the design capacity factor of 0.30****. Guezuraga et al. (2012) compares a 2 MW geared turbine with a 1.8 MW gearless turbine. For the geared turbine data provided from the manufacturer of a typical good wind site location is used,* ***giving a capacity factor of 0.34****. For the gearless turbine,* ***actual operating data*** *from a turbine measured at a site over 9 years is used****, resulting in a capacity factor of 0.21****. It is possible that the two*

different turbines would get somewhat different production if located at the same wind conditions, but comparing two turbines of different types operating under totally different conditions becomes somewhat problematic. This could indicate a tendency to exaggerate expected production rates of wind farms and highlight issues with using expected production numbers for quantification of production.

Communicating emissions and energy use as a fixed value per kWh of produced electricity can itself be problematic. This primarily stems from the vast differences seen in the result depending on the production and the fact that it is not a fixed feature of a certain type of turbine. If measured numbers of a specific wind farm are used, the result can potentially be expressed as a fixed feature for that specific wind farm. However, this does not mean that the specific turbine type will produce the same amount of electricity in other locations. White (2006) states that no two wind farms with the same technology can be expected to have the same energy payback ratio at different locations. Vestas (2011) propose that comparisons should be made between turbines operating in the same wind class. Production should perhaps be quantified not as a fixed production rate, but rather as high and low estimates, giving different scenarios."

Table 3. Capacity factors used in the reviewed studies and method for quantification of production.

Study	Capacity factor	Method for quantification of production
Ardente et al. (2008)	0.19 – 0.30	Low estimate: measured operation data of actual wind farm High estimate: design estimation
Crawford (2009)	0.34 (850 kW) 0.33 (3.0 MW)	Estimated from wind data of typical site and characteristic power curve of turbines
Guezuraga et al. (2012)	0.34 (geared) 0.21 (gearless)	Assumed figure from manufacturer (geared) Measured operation data (gearless)
Lee et al. (2006), Lee and Tzeng (2008)	18.9, 30.9, 42.6 for three different wind farms	Measured operation data of actual wind farms
Martinez et al. (2009a, 2009b)	0.23 *	Assumed as equivalent full-load hours
Schleisner (2000)	0.29 (offshore) ** 0.25 (onshore) **	Unspecified
Tremeac and Menuier (2009)	0.30, 0,20***	Assumed
Vestas (2011)	0.43 **	Derived from Vestas statistical database
Weinzettel et al. (2009)	0.53	Assumed
White (2006)	0.26, 0.29, 0.20	Measured operation data of wind farms

* Calculated from given full load hours per year.
** Calculated from estimated production.
*** Based on a 50 W average power of 250 W installed.

This table above implies that Vestas uses a capacity factor of 43% for their own in-house calculations of turbine carbon footprint per energy delivered. This is unreasonably high for most locations worldwide, and is only based on energy generated, not actually used by consumers – most energy is typically wasted due to

curtailment, as stated above. Realistically the carbon footprint would be multiples of what they state, based on turbines alone; all other sources of emissions for wind farms such as storage, infrastructure and ecocide should also be multiplied to account for curtailment and capacity credit.

There are many other discrepancies in how scientists and manufacturers apportion the emissions and environmental burdens of the wind industry. For example, on the matter of "Natural Resource Inputs:"

*"Most of the reviewed studies express the inputs of material resources as amount of refined resources that are used for building the wind turbine. It could be interesting to discuss what should actually be considered an input. For iron, is the input iron ore or refined forms of iron (cast iron, steel bars, specialized iron-alloys, etc)? The only assessment that mentions amounts of raw material used, instead of refined ones, is Vestas (2011) where masses of unrefined material resources from the LCI are presented in a table. This is an interesting attempt but could be somewhat problematic since it the quantities can be very different depending on, for instance, assumed ore grades. What is even more problematic with the Vestas (2011) LCI table is that recycling credits is included in the table, and some resources even have negative values of usage for different phases of the life cycle. Although this is somewhat intuitively strange, this can partially be explained with that a substitution approach is used instead of allocation of different co-products (Gbegbaje-Das, 2011). When a metal is mined, the co-products are also assumed to be used, thus replacing other production. For some resources, the end-of-life phase is larger than the other phases, making the total resource use negative. As an example, if the two different iron ore grades presented in Table 5 are combined to a total amount of iron ore it adds up to a total of –2.61*10-4 kg iron ore per kWh of produced electricity. This could be interpreted as if you would actually gain 0.26 grams of iron ore for every kWh of electricity produced by the wind turbine, which from a physical perspective on reality is clearly nonsensical. In personal correspondence with Vestas about this issue, representatives claimed that there has been an accounting error related to mass-balancing in Vestas (2011) and that it will be corrected in an updated version of the 2011-report (Garrett, 2011).*

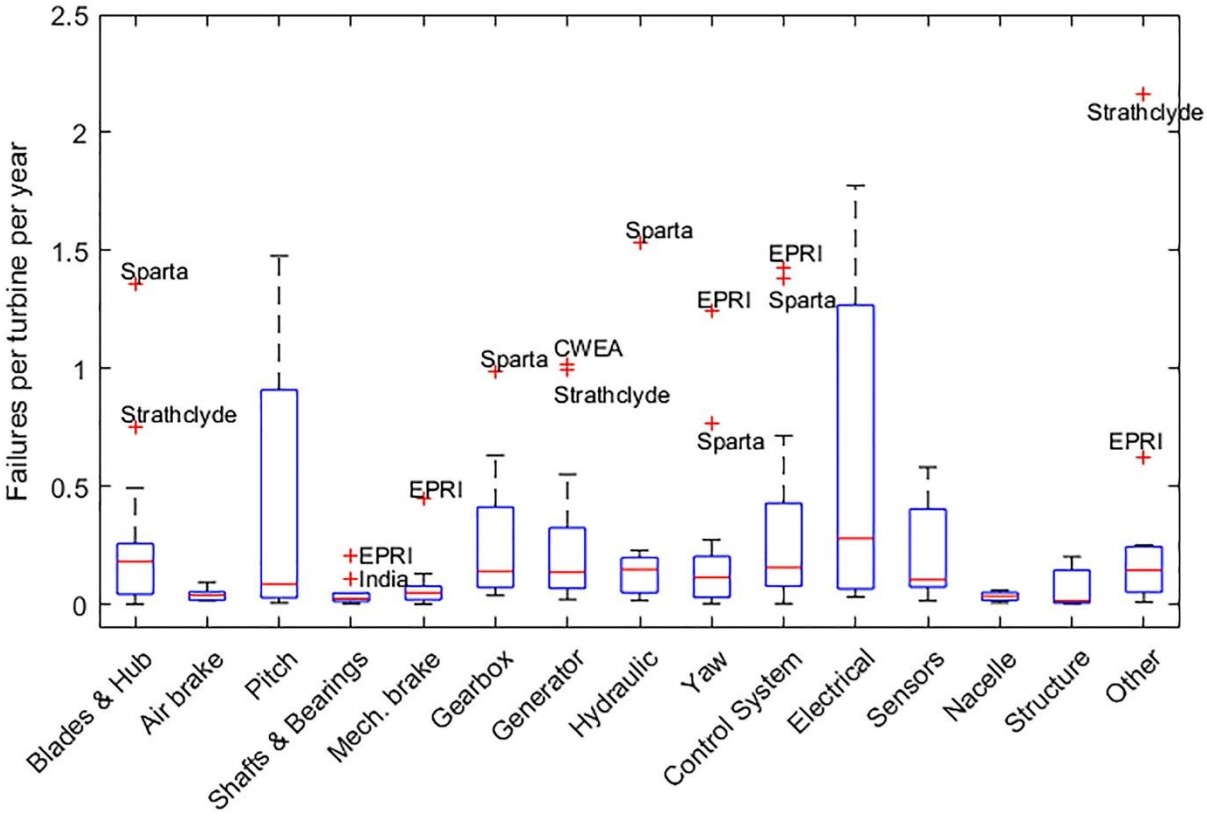
Vestas (2011) should get some credit for the effort of trying to present the amount of natural resources used for building a turbine, but an issue with the numbers is that they obviously do not represent the actual amounts of resources used without subtracting substitution or recycling credits in the numbers. This makes it impossible to use the numbers for assessing the amounts of resources used for building a turbine without using these factors. Presenting negative resource use numbers as "LCI data" is highly questionable and raises questions about what the numbers are actually used for in the LCA. If negative numbers of resource use have been used for assessing environmental impacts, the validity of the study could be questioned."

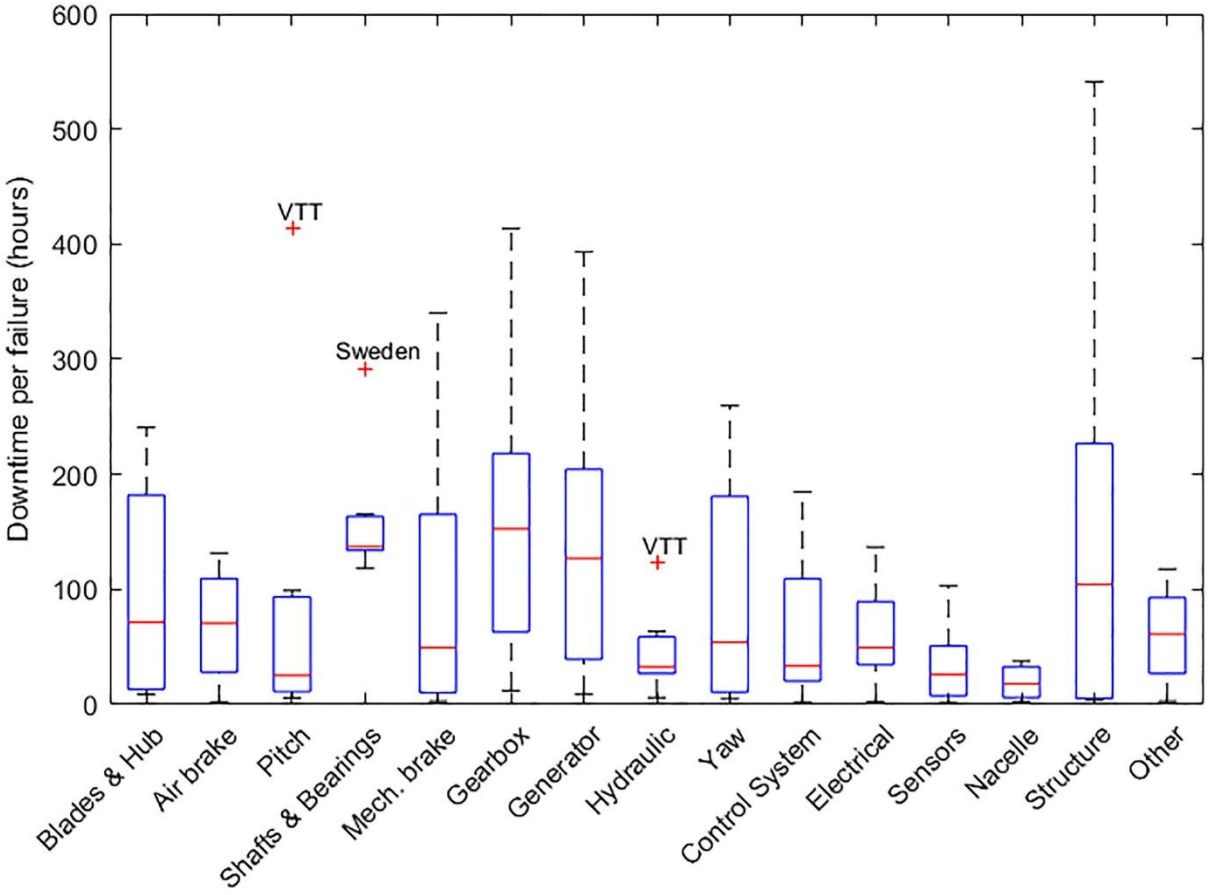
Table 5. Iron ore use in different stages of life cycle of Vestas V112 wind turbine Adapted from Vestas (2011).

Material resources kg / kWh produced	Total	Wind-turbine	Foundations	Transformer	Wind plant set up	Site operations	End of life
Iron ore (56.86%)	-2.68E-04	1.65E-03	1.53E-04	8.06E-06	3.54E-06	1.25E-04	-2.21E-03
Iron ore (65%)	7.32E-06	-9.39E-07	5.73E-06	-8.97E-10	1.10E-09	-6.28E-08	2.59E-06

Maintenance & Repairs

In addition, the carbon footprint costs of operation, maintenance and repairs are typically excluded from consideration. Failures of wind turbines are quite common, and result in an unavailability rate of 11% in terms of lost electricity output. They also have a considerable additional carbon cost, and this never enters the estimates of life cycle emissions. See Graphs below, outlining the frequency and downtimes of failures in the UK.



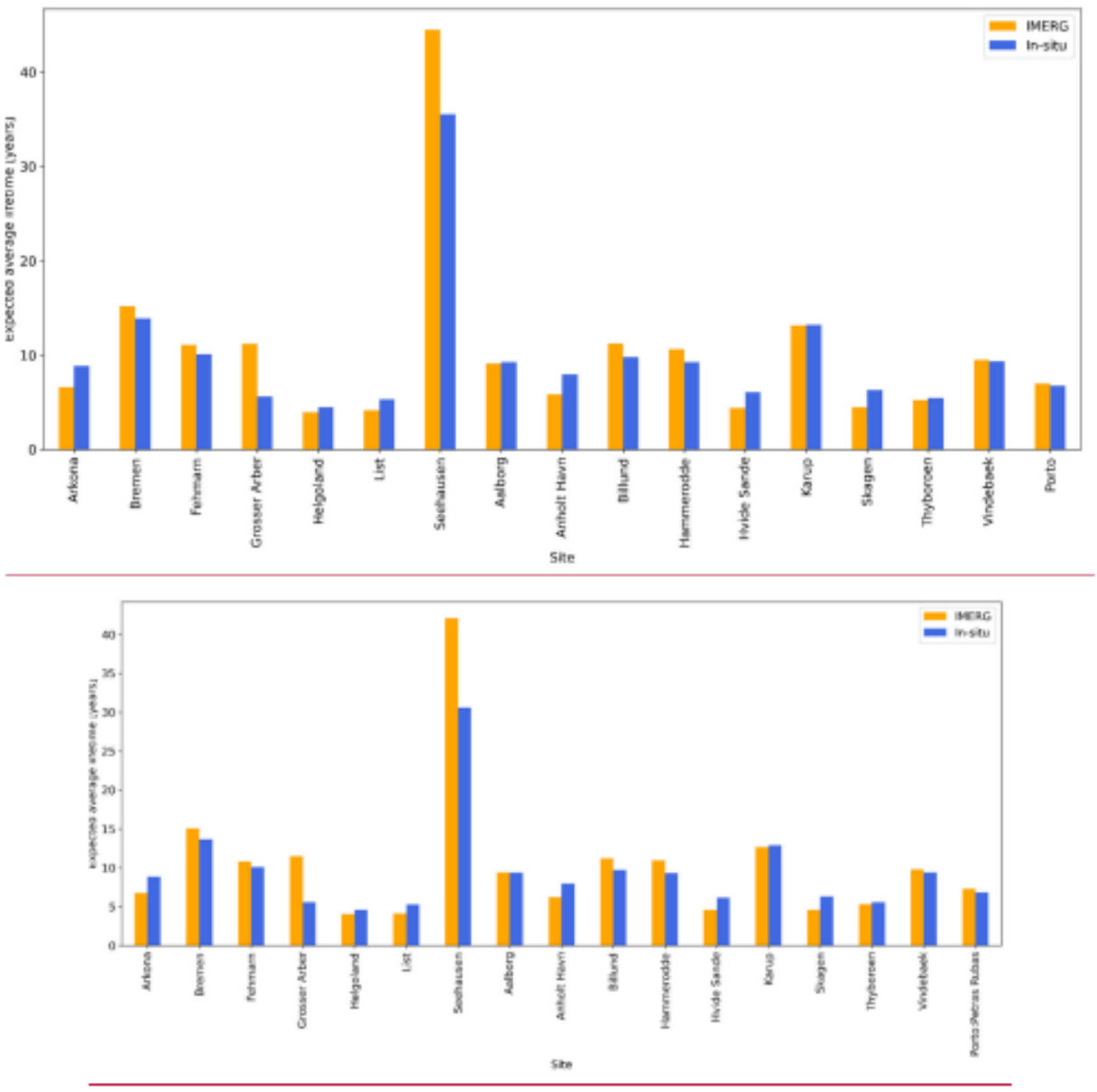


Wind Turbine Blades

Wind turbine blades typically need to be repaired, often multiple times over the course of the wind turbines' average lifespan and usually need to be replace at least once. Replacing blades needs very large cranes, which in Australia are typically transported using extremely large trucks from Melbourne. Emissions of that are considerable but of course never included in any life cycle analysis.

Gearboxes

Wind turbines which contain gearboxes usually need a full gearbox replacement at least once during their lifespan. The use of rare earth magnets in wind turbines removes this problem but creates other massive environmental and climate impacts (see below).

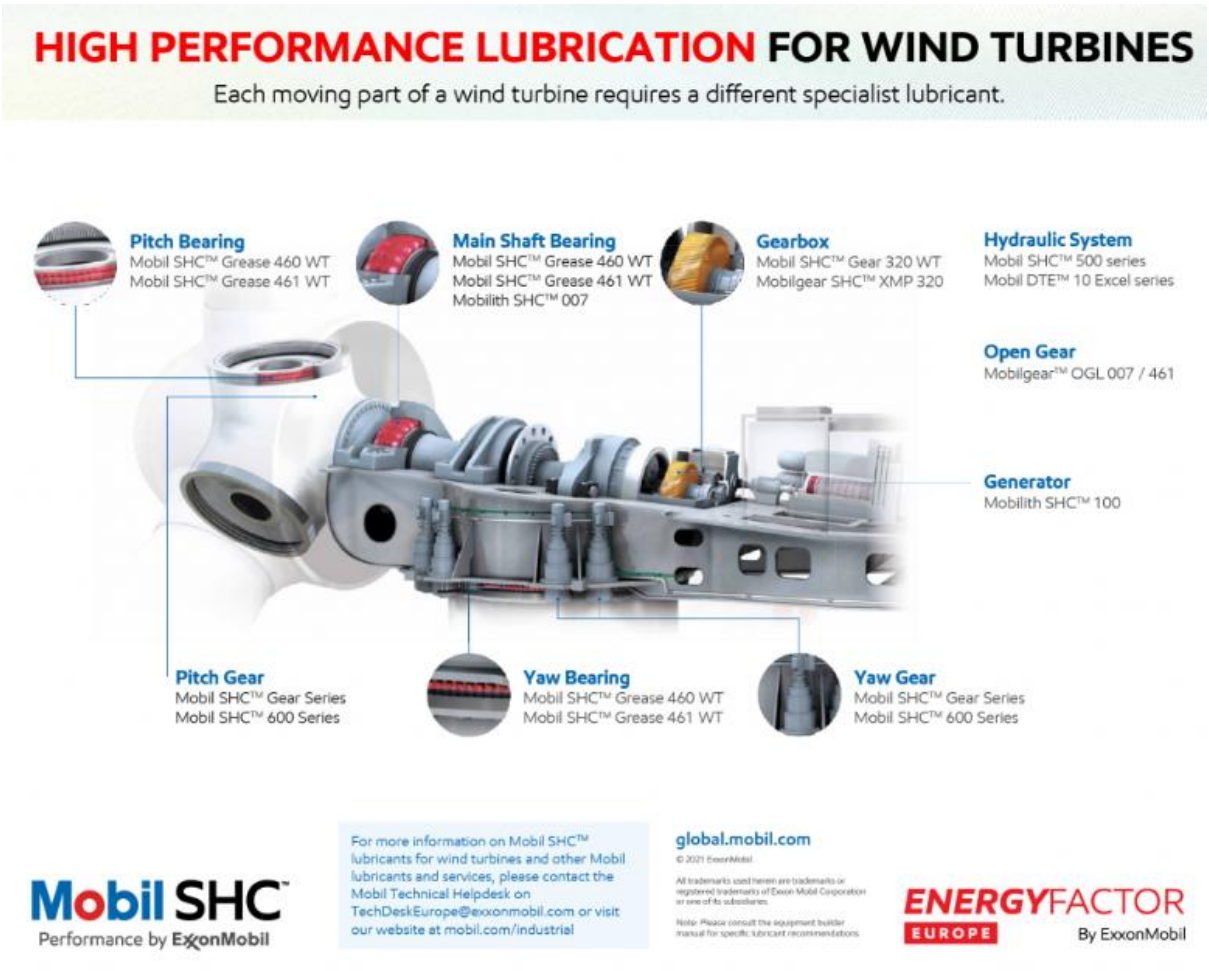


415 Figure 810. Blade lifetimes estimated using 30 minute accumulated rainfall intensities from IMERG and the in situ stations. Note that the Portuguese station Viana do Castello/Chafé is left out due to a limited wind data availability.

Figure 4 Blade lifetimes from wind farms in Europe (blue bars) correlated with rainfall intensities (orange bars); only one wind farm has blades that lasted longer than average wind turbine lifespan of 17.9 years.

Oil-based Lubricants

Wind turbines actually require large amounts of oil for lubrication.



A typical modern, large wind turbine nacelle contains thousands of litres of oil, including 1,100 to 2,000 litres of gear oil, plus significant amounts of hydraulic and transformer oil. However, the exact quantity varies greatly depending on the turbine's size and specific components, with smaller micro-turbines requiring significantly less lubricant.

Factors influencing oil quantity:

- **Turbine size:**

Larger turbines, particularly those used for offshore wind farms, have bigger gearboxes and hydraulic systems, which require larger volumes of oil.

- **Component types:**

Turbines use different types of oils for various functions, such as gear oil for the gearbox, hydraulic fluid for the pitch and yaw systems, and transformer oil to cool electrical components.

- **Offshore vs. onshore:**

Offshore turbines, due to their size and location, can contain significantly more oil than onshore units.

Examples of oil volume in a large offshore turbine:

- **Gear oil:** Up to 2,000 litres
- **Hydraulic oil:** Around 1,100 litres
- **Transformer oil:** As much as 3,000 kg (which translates to about 3,000 litres depending on density).

Typically, oil changes are required every 2 years. Over an 18 year lifespan just one wind turbine will require 30 000 litres of lubricating oil. There are no viable non-fossil fuel substitutes at required scale for this requirement.

This is in addition to the huge requirements for fossil fuels for manufacturing the other components of wind turbines and the power grid infrastructure generally:

Fossil Fuel Materials Requirement

Wind Turbines are the Most Visible Symbols of the quest for renewable electricity generation. And yet, although they exploit the wind, which is as free and as green as energy can be, ***the machines themselves are pure embodiments of fossil fuels***.

• Large trucks bring steel and other raw materials to the site, earth-moving equipment beats a path to otherwise inaccessible high ground, large cranes erect the structures, and all these machines burn ***diesel fuel****. So do the freight trains and cargo ships that convey the materials needed for the production of cement, steel, and plastics. For a 5-megawatt turbine, the steel alone averages 150 metric tons for the reinforced concrete foundations, 250 metric tons for the rotor hubs and nacelles (which house the gearbox and generator), and 500 metric tons for the towers.*

• If wind-generated electricity were to supply 25 percent of global demand by 2030 (forecast to reach about 30 petawatt-hours), then even with a high average capacity factor of 35 percent, the aggregate installed wind power of about 2.5 terawatts would require roughly 450 million metric tons of steel. And that's without counting the metal for towers, wires, and transformers for the new high-voltage transmission links that would be needed to connect it all to the grid.

• A lot of energy goes into making steel. Sintered or pelletized iron ore is smelted in blast furnaces, charged with ***coke made from coal****, and receives infusions of* ***powdered coal and natural gas****. Pig iron is decarbonized in basic oxygen furnaces. Then steel goes through continuous casting processes (which turn molten steel directly into the rough*

shape of the final product). Steel used in turbine construction embodies typically about 35 gigajoules per metric ton.

To make the steel required for wind turbines that might operate by 2030, you'd need ***fossil fuels equivalent to more than 600 million metric tons of coal****.*

A 5-MW turbine has three roughly 60-meter-long airfoils, each weighing about 15 metric tons. They have ***light balsa*** *or foam cores and outer laminations made mostly from glass-fiber-reinforced epoxy or polyester resins. The glass is made by melting silicon dioxide and other mineral oxides in furnaces fired by* ***natural gas****. The resins begin with ethylene derived from* ***light hydrocarbons****, most commonly the products of* ***naphtha cracking, liquefied petroleum gas, or the ethane in natural gas****.*

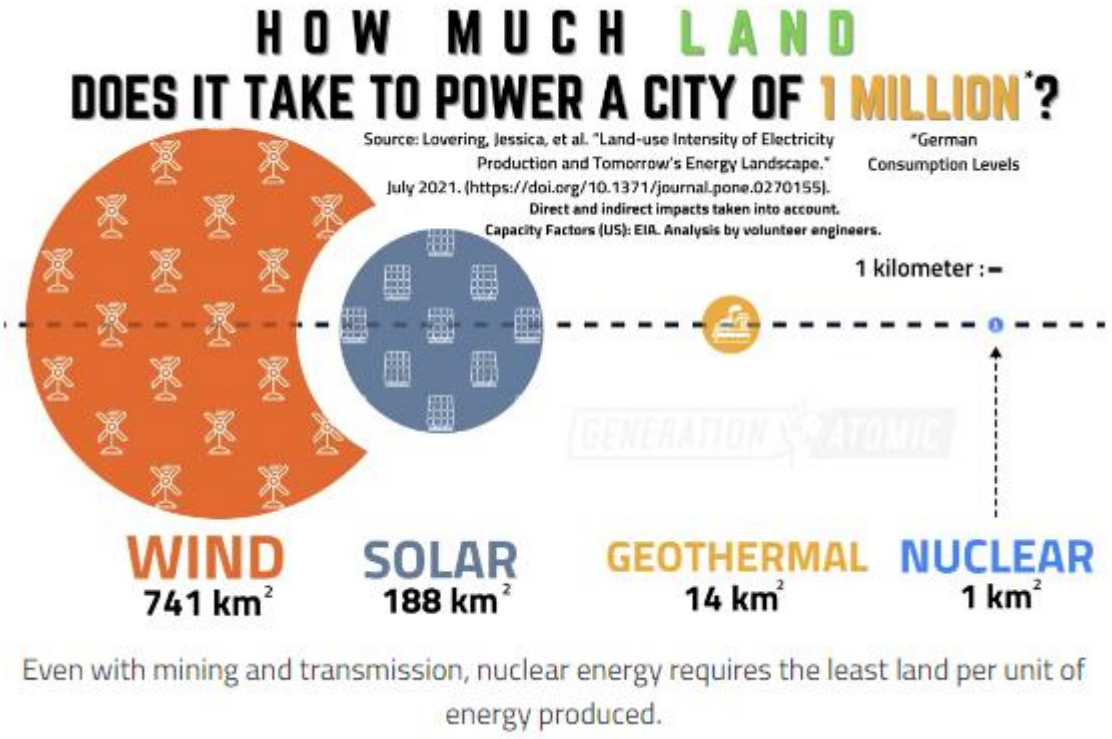
The final fiber-reinforced composite embodies on the order of 170 GJ/t. Therefore, to get 2.5 TW of installed wind power by 2030, we would need an aggregate rotor mass of about 23 million metric tons, incorporating the equivalent of about 90 million metric tons of ***crude oil****. And when all is in place, the entire structure must be waterproofed with resins whose synthesis starts with ethylene. Another required* ***oil product is lubricant****, for the turbine gearboxes, which has to be changed periodically during the machine's two-decade lifetime.*[25]

[25] What I see when I see a wind turbine [Numbers Don't Lie]

DEFORESTATION AND LAND IMPACTS DUE TO THE RENEWABLES INDUSTRY

Land area intensity

Wind energy is massively area-intensive compared to other forms of electricity generation.



The table above states that the area of land required for wind energy to produce the same amount of electricity that a comparable nuclear facility would generate is around 741km2[26].

This study stated that "*In this study, we collected and calculated the land-use intensity (measured as hectares occupied per terawatt-hour of electricity generated in a given year [ha/TWh/y]) for real-world electricity generation*."

So, what was measured was just "real world energy generation". This is indeed problematic, as the authors did not factor in "real world energy consumption" when curtailment is included, and therefore the overbuild required to generate the same amount of electricity by wind 24/7, with and without storage. The land area required by wind energy may indeed by multiples of what is stated in the article. Interestingly, the authors also factored in mining areas for coal, gas and nuclear energy. They chose not to include the vast amounts of critical minerals and rare earth mining required for wind

[26] Land-use intensity of electricity production and tomorrow's energy landscape

energy in order to reach “Net zero” nor did they include large areas allocated for disposal of waste for renewable energy, nor did they include land areas despoiled by mining. So, the true value for wind and solar is likely to be worse, much worse, than the illustration above might indicate.

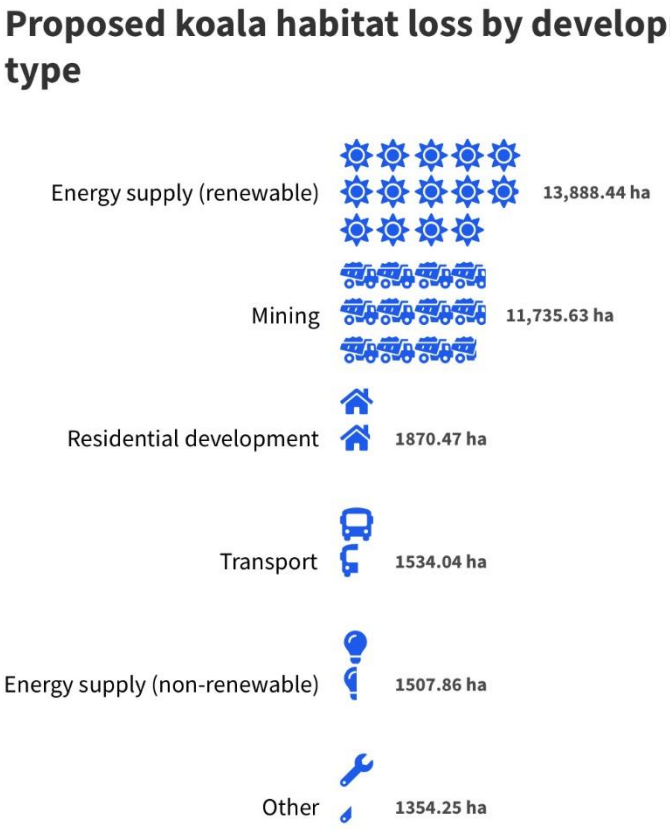
Location Specificity

In addition to vast land area requirements wind and solar are location-specific. For best profitable output, wind farm operators essentially look for two things: average wind speeds, and proximity to established high voltage transmission lines.

In Queensland, like elsewhere, the highest wind speeds are located on elevated land, normally on mountain ranges, and many of these locations happen to be in relative proximity to high voltage transmission lines.

The mountain ranges have largely escaped land clearing for agriculture, as the land is more difficult to access, impossible to farm, of less fertility than the plains, and clearing forests on these ranges poses an unacceptable erosion risk, which is especially important in catchments which drain into the Great Barrier Reef waters. They also mostly harbour remnant forests, which have never before been cleared. They are islands of biodiversity in an increasingly fragmented landscape.

None of these factors have stopped the wind industry from scouting ranges containing remnant forests which are not protected by national park and state forest status; they have drafted agreements with landholders, erected wind-monitoring towers, and conducted environmental surveys via environmental consultancies which are picked by wind farm developers on their proven track record of “getting projects over the line” of the EPBC approval process.



The mining sector runs a close second, with 11,735.6 hectares slated for clearing — about 37 per cent of proposed koala habitat loss.

About 5000 hectares is related to 20 coal project proposals, while 5461 hectares is for a single liquid natural gas project by Australia Pacific LNG.

Figure 5 From ABC article on current and proposed koala habitat loss, 2024

Figure 6 Upcoming wind farm impacts in Queensland from 2024 - new data reveals this is the tip of the iceberg

Almost all of the areas have never been surveyed properly environmentally before, as most are on private land. The environmental surveying consultancies are clearly incentivised to downplay and ignore the ecological significance of the project areas, and to downplay impacts of wind and solar farms. Their reports reflect this, through clear instances of inadequate surveying in terms of both manpower and time allocations, and areas covered, and survey types conducted, and the reports are often full of inconsistencies and glaring omissions and downplaying of impacts. Often the only threatened species and ecological communities identified are those which are commonly known to inhabit these areas. All other species which may inhabit these areas based on ecosystem type and geographical type are typically not found. The consultancies know that their findings will not and cannot be scrutinised as no other ecologists are allowed into these sites. **This is completely unscientific in its basis, as true science involves total objectivity, and results which can be repeated by other scientists and scientific teams.**

Multiple significant impacts such as invasion of aerial habitat, noise and physical disturbance causing habitat denial and alienation, are not considered as significant impacts despite copious research conducted in the northern hemisphere identifying these as significant impacts[27], which, according to the EPBC Act and the DCCEEW's own guidelines, must be identified and addressed according to the "avoidance-mitigation-offset" hierarchy. They are not. **All wind farms in such areas of remnant forest are in effect ILLEGAL, as there are multiple clear breaches of the EPBC Act.**

In addition, the developers, in collusion with the environmental consultancies, publish information on emissions which is clearly incorrect in that it downplays the climate costs of wind farms in such areas, often ignoring loss of carbon sequestration and edge

[27] Review: Several groups of birds and mammals avoid wind turbines

effects, loss of shading, and numerous other effects that the intact forests would have had. The benefits of replacing coal generation are overstated, as unrealistically high capacity factors are stated – for example 40% in the case of the Gawara Baya wind farm with no independent data to justify this. There is no consideration of curtailment and capacity credit effects which would substantially diminish the wind farm's capacity to replace baseload power generation, and no mention of the requirement to utilise storage and balancing fossil fuels (natural gas) to achieve the same ends. The environmental reports are completely flawed but these are what the DCCEEW use, without question, to base their decisions on.

The wind industry, environmental consultancies and DCCEEW openly collude with each other, and the whole process is completely open to corruption. The DCCEEW is not a regulator of such projects but instead partakes in the greenwashing of these projects.

In terms of the direct climate effects of wind farms in such areas which fully or partly destroy remnant forests and woodlands, the effects can be measured based on the assumptions that above and below ground biomass will be destroyed and the carbon emissions of that will eventually reach the atmosphere as CO2. In addition, the foregone loss of carbon sequestration can be measured based on the CO2 which would have been sequestered by the ecosystems had they been left intact. Often only the emissions of the direct destruction of ecosystems is considered an emissions impact of wind farm development.

What is also missing are calculations of edge impacts of clearing leading to forest degradation, loss of shading, desiccation effects which compound degradation, defaunation effects, and loss of evapotranspiration cycling. There is never any attempt made at considering these in terms of climate impacts. For these reasons, again, the supposed emissions benefits of wind farms are clearly overstated.

Generally, many proposed wind farms, and those being built, in Queensland have clearing impacts which roughly equate to 1.5-2ha of cleared forest/woodland per MW of maximal nameplate electricity generation.

There is one useful scientific article[28] which I have been able to identify that relates to carbon costs of wind farm deployment. Unfortunately, no such science has been conducted in Australia as far as I am aware. I will use their figures as a rough "ballpark" figure, fully acknowledging that is all they are. It seems scientists in Australia that could perform such work[29][30] have been too busy colluding with government "Net Zero" plans,

[28] Quantifying the land-based opportunity carbon costs of onshore wind farms
[29] Degradation and forgone removals increase the carbon impact of intact forest loss by 626%
[30] Retention and restoration priorities for climate adaptation in a multi-use landscape

deciding what wildlife, ecosystems and biodiversity should be sacrificed for "Net Zero"[3132] (note the study is funded by BP).

This study found that the emissions cost of wind energy in forested areas was 88g CO2/kWh based on ecosystem loss alone. They assumed that there was 1ha of deforestation per turbine. They did not stipulate what size wind turbines were considered. On brief review of wind energy in Scotland, the average turbine size is 2-3MW. So, assuming that the average wind turbine is 2.5MW, that gives 0.4ha of deforestation per MW.

The amount of deforestation we are seeing in Queensland is about 4.4 x that of Scotland per MW. **So, the carbon cost of wind energy in Queensland, based on deforestation alone would be around 390g CO2/kwh, based purely on electricity generation, not consumption. If we are to consider electricity consumption decline due to curtailment, the figure would be around 4x that again, so around 1550g CO2/kWh (end of life figure). Remember, coal is around 880g CO2/kWh, and the 1550g CO2/kwh also does not include multiple other facets of wind energy generation emissions and climate effects, and the 1550g CO2/kWh figure is only reached at end of life. WIND ENERGY IN QUEENSLAND IS WORSE THAN COAL ELECTRICITY GENERATION.**

Another way to calculate this is:

If we assume above-ground biomass of open eucalyptus forests is around 250t/ hectare (range 50-500t/ha)[33]. For a subtropical eucalyptus forests, around 42.5% of total biomass is below ground[34]. So, it would be reasonable to assume that total biomass is 435 t of carbon per hectare. When that is cleared, we would ultimately expect to get emissions of 1600t of CO2 per hectare. A 400MW wind farm which results in the destruction of 700ha of open eucalyptus forests would release 1 120 000t CO2 (or 1 120 000 000 000 g CO2) from deforestation. CO2 sequestration of open eucalyptus forests ranges from 2-17 t of CO2e per hectare per year[35]. If we assume that the figure is 5 t, then that equates to 140 000 t CO2 foregone loss of carbon sequestration over 40 years – 40 years would be a reasonable figure in terms of total time allowed for the project before rehabilitation is supposed to commence (if it ever does)..

These two figures combined give a total of 1 260 000t CO2 emissions, or 1 260 000 000 000 g CO2 emissions, which equates to 1 800 000 000g CO2/MW. If we add his to the calculation of emissions based on embodied materials emissions, we get a total of

[31] Collaboration can unlock Australia's energy transition without sacrificing natural capital
[32] Negotiating risks to natural capital in net-zero transitions
[33] Farming carbon – Qld Government
[34] Biomass and structure of a subtropical eucalypt forest, North Stradbroke Island
[35] Farming carbon – Qld Government

2700000000g CO2/MW. **That gives a total of 77g CO2/kWh at end of life**. However, we have not included other climate impacts including edge effects (20% loss of carbon to 500m from clearing), and defaunation effects, and the multitude of other emissions associated with wind farms in attempting to replace coal generation. If we are to apply a curtailment adjustment, the 77g CO2/kWh becomes around **310g CO2/kWh**, which is similar emissions to closed cycle turbine gas generation. But there are still other emissions sources to include, such as many other facets of wind farm construction, operation, and decommissioning, and loss of other climate regulating functions of intact forests. Include all other sources of emissions and the calculation would easily be greater than 500g CO2/kWh and maybe as high as 1500g – 2000g CO2/kWh at end of life.

In summary, the true emissions calculations of wind farms, when they destroy mainly remnant forests is similar to, if not worse, than fossil fuel electricity generation. Why are we doing this?

BALANCING EMISSIONS

There are still other emissions sources which have not been identified that should be added to the mix when considering the climate impact of wind and solar energies. Another emissions source is that of the increased emissions of fossil fuel generation when forced to provide balancing and reserve for variable renewables generation. This was briefly considered in the IPCC report of 2014, but the impact was downplayed and thought likely to be insignificant.

However, a new peer-reviewed scientific paper[36] has been published since then which identifies that due to the increased emissions incurred by the ramping of natural gas generation (rapid changes in output) when forced to provide balancing for wind generation, the overall emissions are similar to those that would be incurred if the total generation included no wind and only gas generation running fairly constantly to correlate with demand. Despite this study, there has been no official acknowledgement that this is an issue. And this study assumed that the stated emissions of wind energy were otherwise correct. The stated emissions of wind energy are not correct, so the situation is likely much worse with wind energy in the grid. Personal communication with the author of the study revealed that the extra emissions of ramping were at least 100g CO2/kWh and this is totally due to the presence of significant amounts of wind energy in the grid.

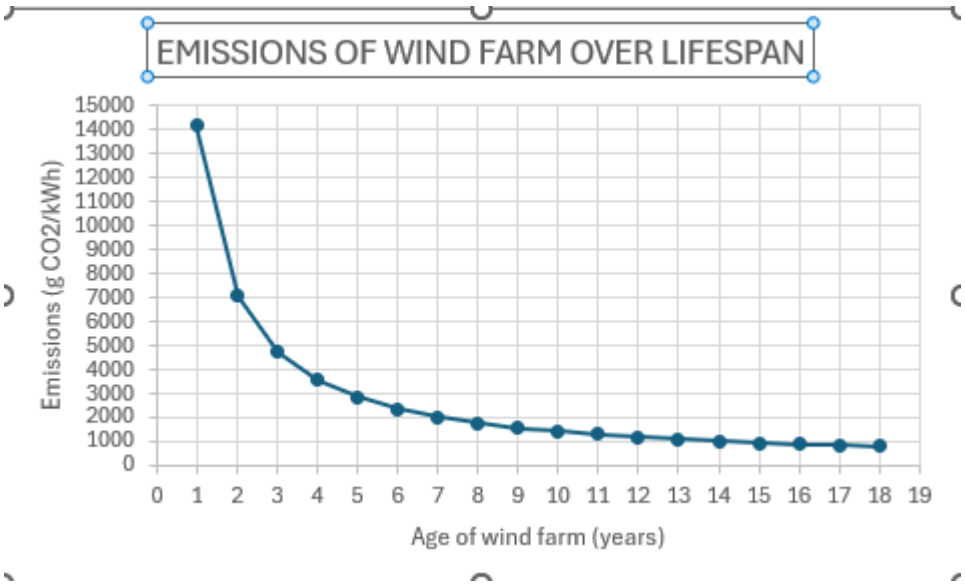
[36] Wind energy is not sustainable when balanced by fossil energy

Indeed, it is forecast by AEMO[37] that natural gas electricity generation that gas consumption will need to increase, both in response to VRE, but also with population and economic growth. How exactly are we "averting emissions' and saving the climate?

THE UPFRONT EMISSIONS CONUNDRUM

Unlike baseload generation, the emissions of wind and solar energy are largely upfront. This means that most emissions of wind and solar electricity generation are actually released into the atmosphere before any electricity is generated. With rapid expansion of wind and solar, this inevitably means that there is a large emissions burden upfront which will obviously make climate change worse, especially as many of these projects involve loss of ecosystems from mining and deployment, causing loss of carbon uptake and loss of other vital climate-regulating effects of the biosphere.

The emissions profile of wind and solar energy generation is highly variable due to variability in wind speeds and cloudy conditions between locations, distance from demand, carbon emissions incurred in building remote projects, and many other factors.



In addition, the emissions of wind energy are highly variable over time, even on a per turbine and wind farm basis, and they actually vary greatly over time. Conventional emissions calculations are done on the assumption that every wind and solar farm reviewed is at the end of life, as the total electricity output over the projected lifespan is used as the basis for calculations. However, the carbon and other climate burdens of wind and solar farms is heavily skewed towards the period of months to years before electricity generation even occurs. By rights, this should be taken into account, and the at least the emissions calculation should be based on the age of the wind farm and the

[37] Gas Statement of Opportunities March 2025 For Australia's East Coast Gas Market

electricity generated thus far. If looking at a fleet of wind farms, the median age of the wind farms would be a far more accurate basis for emissions calculations. If wind farms are in general only a few years old, then the emissions would be calculated as considerably more than double end of life calculations would reveal. The current and pervasive means of calculating emissions of wind and solar farms is inaccurate and simply wrong.

CLIMATE EFFECTS OF WIND ENERGY

In addition to the carbon and other costs of wind and solar energy, it is clear from numerous papers that wind energy causes surface warming by atmospheric layer mixing. It has been calculated that when there are enough wind farms, they will cause 0.24 degrees Celsius warming over the continental USA, and this means that it will take a century for the "decarbonising" effect of wind industry to negate this warming effect[38] – if it indeed ever does, as there really is very little or no decarbonising effect. The same will apply to Australia if and when the "Net Zero" plans come to fruition. Add to that the climate effects of industrial-scale solar which incur a significant local warming effect, especially overnight, loss of albedo, and loss of carbon sequestration, as well as emissions of deforestation from many wind farms. All these effects are much worse if indeed these facilities are located in areas where remnant forests are destroyed and there is really no climate benefit in the first place.

In addition, wind energy causes drying out of soils[39] and landscapes, and increases fire risk through multiple mechanisms. All these effects also in effect increase emissions and the climate burden of wind farms.

SUMMARY OF WIND ENERGY EMISSIONS

Wind energy is consistently stated to be "zero emissions", "low emissions", "decarbonising", "slashing emissions".

This is only achieved by limiting scope of analysis, cherry-picking emissions, and downplaying or ignoring adverse emissions and environmental consequences of wind energy generation.

When all factors are included, it appears that wind energy, especially when located in relatively intact ecosystems, is absolutely no better than fossil fuel generation. And in terms of direct biosphere impacts, it appears to be worse, because not only are emissions similar if not worse, wind and solar energies are causing direct environmental destruction; destruction of habitat and biodiversity.

[38] Climatic Impacts of Wind Power
[39] Wind farms dry surface soil in temporal and spatial variation

Governments, the ALP party, the Greens party, and major environmental groups have been willingly hoodwinked into accepting, indeed campaigning for environmental destruction for the wind industry. We need to ask how this has come to be.

MORE DOWNSIDES TO WIND ENERGY

Fauna

Mentioned above is the habitat denial and alienation suffered by many groups of wildlife in proximity to wind farms. The cumulative defaunation effects of wind turbines via bird and bat collisions is poorly defined and almost totally reliant on contractors and employees of the wind farm operators who are commissioned to do infrequent mortality surveys beneath wind turbines, normally for only the first two years of operation. Because these are not independent, and wind farm operators are heavily incentivised to not disclose the full scope of mortality suffered by birds and bats, one must be very dubious about the results presented. On the rare occasions when bird and bat carcass surveys have been performed by independent academics, the mortality revealed is many multiples of that which had previously been disclosed[40].

Insects

I addition to larger fauna, wind turbines kill around 40 million insects per turbine per year in Germany, a temperate country[41]. In Australia, where a large part of the continent is tropical and subtropical, one would expect the insect mortality to be much greater. This will also have direct and indirect effects on wildlife and surrounding ecosystems, causing more defaunation and degradation.

Microplastics

There are even more environmental issues with wind energy. It has been recognised by the industry that leading edge erosion causes degradation of wind turbine blades, leading to fragmentation and loss of the epoxy coatings. These are essentially microplastics, and by extrapolation of industry data, independent scientists have calculated that this causes wind turbines to shed around 62kg of BPA-containing microplastics per turbine per year into the surrounding environment. Other studies which have provided results which dispute that, and some claim that the microplastic loss amounts to only 150g per turbine per year. Another report provided highly variable results from 3g to 14kg per year[42]. The 14kg figure apparently was deliberately exaggerated because it assumed that the

[40] Wind turbines operating without curtailment claim many victims among protected bat species in Germany
[41] Insect fatalities at wind turbines as biodiversity sinks
[42] Eerste inzicht in emissies van chemische stoffen bij windturbines op land

entire blade length is affected by erosion. Even so, it does suggest that the upper level might potentially be of the order of kilograms of microplastics per turbine per year.

PFAS

There is some evidence that wind turbines contain "forever chemicals" PFAS which are mainly used to make the wind turbine blades stronger and more durable. Where PFAS are found in wind turbines:

Blades: PFAS are incorporated into the composite materials and protective coatings of wind turbine blades to enhance their resistance to weathering and prolong their operational life.

Towers: Similar to the blades, PFAS can also be found in the protective paints and coatings on the turbine towers.

Epoxy resins: The resins used in manufacturing wind turbine blades may contain Bisphenol A (BPA), a type of chemical that can be released into the environment.

If so, one would expect them to be shed into the environment with the microplastics. However, the chemical most commonly identified as being of concern is PFA. Perfluoroalkoxy alkane (PFA) is used in wind turbine coatings to create superhydrophobic surfaces that enhance anti-icing performance by delaying ice formation and reducing ice adhesion strength, thus preserving wind turbine efficiency and extending blade lifespan. PFA itself has not been banned in Australia and is regarded as one of the less dangerous PFAS chemicals, however its full health impacts, bioaccumulation potential, and degradation profiles are poorly known.

SF6

Sulphur hexafluoride is the most potent greenhouse gas known to mankind, with a warming potential around 23 500 times that of CO2. It is widely used in the electrical industry to prevent short circuits and accidents, as well as in wind turbines.[43]

Leaks in the EU in 2017 were the equivalent of putting an extra 2017 cars on the road. Just one kilogram of SF6 warms the Earth to the same extent as 24 people flying London to New York return. It also persists in the atmosphere for a long time, warming the Earth for at least 1,000 years.

Each wind turbine contains around 5kg of SF6 gas. SF6 is poorly regulated in Australia, and many wind turbines will leak this gas – each wind turbine would then contribute the same GHGs as 125 people flying London to New York return.

[43] Climate change: Electrical industry's 'dirty secret' boosts warming

There are alternatives to using SF6 to prevent short circuits but these are more expensive. Because the wind and solar industries are profit-driven, alternatives will not be used because it's not about the climate and never was.

This study[44] showed that in 2017 the amount of SF6 used was growing by 30-40 tons per year in the UK with their attempted "transition". There will be much more extensive use and more extensive leaks now.

In Australia, governance by the Clean Energy Regulator of the use of SF6 and other potent hydroflurocarbon greenhouse gasses relies entirely on industry reporting their use and any leaks[45]. This is essentially self-regulation. Does anyone in the Senate Inquiry see a problem with this? I cannot find any evidence of any co-ordinated effort to recycle this gas and prohibit leakage in Australia.

EMISSIONS OF SOLAR ENERGY

I will not delve deeply into the emissions of solar energy except to say the stated emissions of industrial-scale solar energy are underreported by a factor of 3 and maybe as high as 5, as the stated emissions assume that solar panels are manufactured on low emissions power grids in Europe[4647]. The reality is that most solar panels are manufactured in China on power grids where high emissions and poor quality coal dominates[4849]. In addition, this assessment does not include any land use changes which might occur as a result of solar farm deployment such as deforestation and loss of trees which has already happened at multiple wind farms in Australia, such Aldoga and those in the Western Downs. And the stated emissions of solar do not include storage emissions and curtailment effects, leading to reductions of energy consumed, which would mean that emissions are again multiplied to around three times that stated in effect. So, if Enrico Marriutti is correct, the end of life emissions of solar would end up being around 600g CO2/kWh to over 800 CO2/kWh, which is similar to coal, and perhaps even worse, due to land use effects leading to direct and indirect loss of carbon sequestration.

Charcoal

As well as requiring coal for production, both as energy input and material, solar panel production in China is causing the deforestation of 14000 football fields of forests in Myanmar every year for the production of charcoal which is used to heat high

[44] Evaluation of SF6 Leakage from Gas Insulated Equipment on Electricity Networks in Great Britain
[45] Reporting hydrofluorocarbons and sulphur hexafluoride gases guideline
[46] Solar Panels Are Three Times More Carbon-Intensive Than IPCC Claims
[47] The real carbon intensity of photovoltaic energy
[48] Where are solar panels made?
[49] What is causing the record rise in both China's coal production and imports?

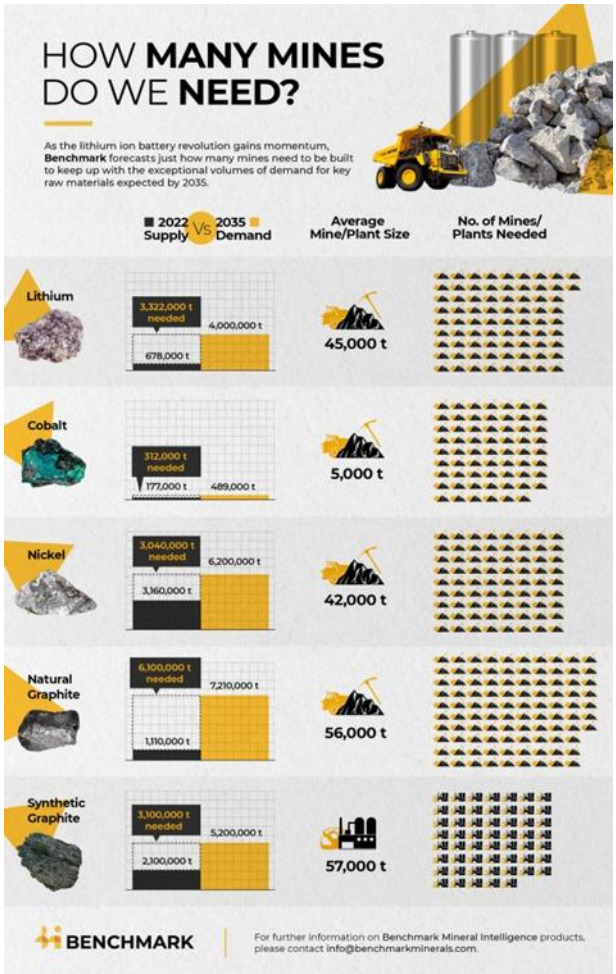
temperature kilns in solar panel production[505152]. The impact of deforestation for production of solar panels is not included in any life cycle emissions estimation, nor are many other steps of production and sources of emissions. [53]

Figure 7 Aldoga solar farm (partly in the yellow polygon) to the west of Gladstone caused significant deforestation of native vegetation, coloured areas are "offset" areas that somehow are meant to negate the impact of clearing.

[50] Burning down the house: Myanmar's destructive charcoal trade
[51] The charcoal hunters
[52] Illegal charcoal trade threatens Myanmar's remaining mangroves
[53] Why do we burn coal and trees to make solar panels?

MINING EXPANSION

Attempted "Net Zero" transition will necessarily involve massive expansion of critical minerals mining. The common narrative is that fossil fuels usage will be reduced due to the transition. This is incorrect, as almost all mining is currently undertaken with diesel. Even mining which is powered by "renewables" has increased upstream utilisation of diesel to provide the critical minerals and other materials which enable this to happen. The attempted transition means that more diesel will be consumed and burned for decades to come, not less[54]. Benchmark Minerals has found that we will need an extra 384 large mines for various critical minerals. They will almost all be powered directly by diesel. This study[55] on critical minerals requirements for Net Zero has found that mining for critical minerals will need to expand 16x above 2020 levels. The demand for rare earth elements in NdFeB magnets during 2040–2050 will increase by two orders of magnitude compared with the previous decade (2011–2020).



The emissions burden of rare earth mining is massive. In 2020 around ¼ of rare earths were used for wind turbines and EVs, meaning that the rare earth supply chain

[54] Want Clean Energy? We'll Need More Fossil Fuels
[55] Increase in demand for critical materials under IEA Net-Zero emission by 2050 scenario

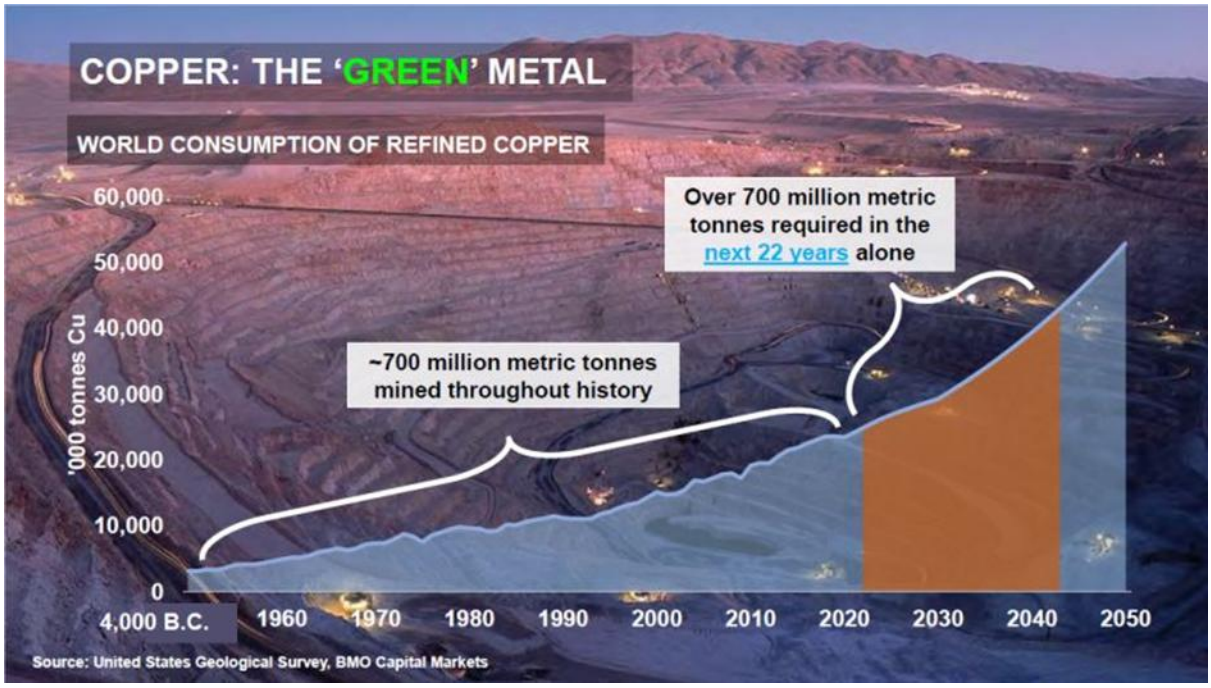
contributed around 1 billion tons CO2 per year[56]. However, demand for rare earths will increase by two orders of magnitude above 2020 levels, as stated above, so about 100 times. Another paper states that rare earth demand will rise 11-26 x more than 2020 levels[57]. Current global emissions are around 36-38 billion tons CO2e per year. The demand for rare earths alone is enough to blow global emissions out of the water; even if emissions from this source are at the bottom end of predictions that's an extra 11b tons CO2, and it is unlikely there will be little overall reduction in fossil fuels, if any, as we have seen so far. But of course, increasing deforestation and foregone loss of carbon sequestration. Rare earths are poorly recycled and will likely remain poorly recycled. Any recycling effort is in itself emissions-intensive.

Copper

"Copper is another crucial resource for supporting the growth of the EV and renewable energy market but also maintaining demand for traditional uses like construction, transportation and telecommunications. From a demand perspective, a rather scary forecast has been formulated which predicts around 700 million tonnes will be required in the next 22 years alone, the same amount that humanity has consumed since 4000BC

To meet this colossal figure, it's estimated around $100 billion will need to be invested by 2030. To put that into perspective, the largest copper mine in the world – Chile's Escondida – produces 1.4 million tonnes annually, more than the world's second and third largest copper mines combined. Meeting this demand means building just under two Escondida mines every month over the next 22 years."[58]

[56] Global environmental cost of using rare earth elements in green energy technologies
[57] Critical Rare-Earth Elements Mismatch Global Wind-Power Ambitions
[58] How Many New Mines are Needed to Resource the Future of Renewable Energy?



Graphite

Graphite is going to be the most sought after resource with the largest number of new mines and plants needed to feed demand for anode materials. There are two types of graphite that will be required – natural and synthetic.

It's estimated **that 97 natural flake mines will need to be built** and in operation by 2035, assuming an average mine/plant size of 57,000 tonnes. That means that by 2035, 7.2 million tonnes will need to be available for the battery market, up from 2.1 million tonnes in 2022.

From a synthetic graphite standpoint, which is produced using pet needle coke or coal tar pitch, 54 plants with an average production size of 57,000 tonnes must be available by 2035.

Lithium

Lithium, the favourite of the EV industry and often regarded as the 21st Centuries 'Gold Rush' item, will be a dominant factor in meeting the demands of battery and EV manufacturing. In 2022, lithium supply reached 678,000 tonnes, a record for extraction in a year. However, this quantity seems insignificant compared to what demand will reach in 2035 with 4 million tonnes of the resource projected to be required, equating to around **74 new lithium mines** with an average size of 45,000 tonnes by 2035.

To achieve this monstrous goal, its estimated $7 billion will need to be invested each year until 2028 to meet demand. Should this level of investment fail to be achieved, recycled lithium is set to make up the shortfall. Thanks to a new promising recycling method where the refurbishment of a cathode takes place, batteries can perform on par with, and in some cases better than, new batteries.

Nickel and Cobalt Nickel and Cobalt are set to double and triple in demand respectively**. For nickel, 72 new mines** with an average size of 42,000 tonnes will be necessary. Cobalt on the other hand will need **62 new mines** with each producing 5,000 tonnes of the mineral each year.

A wind turbine contains around 8000 individual components and dozens of different base minerals and materials. The minerals are mined in different mines globally, and components are made in many different factories, often globally. The table below is not complete and obviously excludes the fossil fuels used as base materials for plastics, epoxy resin, and coatings.

Fig. 1. Raw materials used in wind turbines.

Table 1. Material usage estimates in t/GW for different wind turbines (Carrara et al., 2020).

Material	DD-EESG	DD-PMSG	GB-PMSG	GB-DFIG
Aluminum (Al)	700	500	1600	1400
Boron (B)	0	6	1	0
Chromium (Cr)	525	525	580	470
Cobalt (Co)	N/A	N/A	N/A	N/A
Copper (Cu)	5000	3 000	950	1400
Dysprosium (Dy)	6	17	6	2
Iron (cast) (Fe)	20100	20 100	20800	18000
Manganese (Mn)	790	790	800	780
Molybdenum (Mo)	109	109	119	99
Neodymium (Nd)	28	180	51	12
Nickel (Ni)	340	240	440	430
Praseodymium (Pr)	9	35	4	0
Terbium (Tb)	1	7	1	0
Zinc (Zn)	5500	5500	5500	5500

The mining and associated waste of each of these minerals carries with it cumulatively massive impacts on human health as well as the health of wildlife, biodiversity, ecosystems and farmland. Some of these impacts are listed below.

Aluminium (Al)

One of the materials used in wind turbine production is aluminium, and China is one of the largest producers. When aluminium is extracted, a waste product is created. The waste product is red mud, a mix of undissolved alumina, iron oxide, silicon oxide, titanium oxide, and other metals in smaller quantities.

Figure 8 Qld Alumina red mud waste dump just to the south of Gladstone

The mining of aluminium emits CO_2 emissions. The global average of CO_2 emissions for both mined aluminium and recycled aluminium is 11.5 tonnes of CO_2 per tonne of aluminium.

Boron (B)

Typically, boron is extracted in open-pit mines by drilling, blasting, crushing, and hauling all activities fuelled by petrochemicals. The refining process then uses a significant amount of water. Finally, the waste product is deposited in artificial ponds where further refining is done before the water is discharged into the local watershed.

Chromium (Cr)

Chromium mining takes place mostly in South Africa. Usually, the mines are situated in rural areas where people live off the land with their livestock. Mining companies, by law, are required to make binding commitments for projects that will benefit a community affected by mining, but the communities are rarely consulted. Instead, they get a job in the mines as compensation for the land that is taken away.

Cobalt (Co)

When mining cobalt, particles are emitted. These include radioactive particles, cancer-causing particles, and more health-critical particles.

Copper (Cu)

Copper is a common extracted material, as it is used in most products nowadays. One example of the usage of copper is in electrical cables. However, the extraction of copper often requires a lot of land and can create several environmental problems. The CO_2 emissions of copper equal 2.4 kg of CO_2 per kg of copper.

Dysprosium (Dy)

Dysprosium is a rare earth metal, and only about 100 tonnes are produced worldwide each year, with 99% of the total production coming from China, the Bayan Obo district in Inner Mongolia. The mines of Bayan Obo are the largest deposits of rare earth metals yet found and are responsible for 45% of global rare earth metal production. Approximately 75 cubic meters of acid wastewater, 12,000 cubic meters of waste gas, and approximately one tonne of radioactive waste are released per tonne of mined rare earth metals in Bayan Obo.

Manganese (Mn)

Manganese is an essential material for producing iron and steel and is very common on earth. Manganese is also used for other purposes. For example, it is a catalyst to decolorize and make violet-colored glass. Moreover, the different compounds of manganese are used to create dry cells and batteries. However, manganese needs to be refined, and this process creates waste emissions both in the sea and in the atmosphere. Manganese mining emits 6.0 tonnes of CO_2 per tonne mined manganese.

Molybdenum (Mo)

Molybdenum is only found in various oxidation states in minerals and does not occur naturally as a free metal on Earth. In 2011, China, the United States, Chile, Peru, and Mexico were the primary molybdenum producers. The overall deposits are believed to be 10 million tonnes, with the majority concentrated in China, Chile, and the United States. Molybdenum mining emits 5.7 tonnes CO_2 per mined tonne material.

Neodymium (Nd)

To obtain neodymium, uranium and thorium are combined. Following their usage, these radioactive elements and a plethora of other harmful substances are discharged into the nearby environment). It has been estimated in an article by the Digital Journal that for every ton of neodymium produced, 340,000 to 420,000 cubic feet of hazardous fumes, 2600 cubic feet of acidic water, and one tonne of radioactive waste are created.

Neodymium consumption has rapidly increased in China over the past few years from producing electric vehicles and wind turbines. Regarding wind power generation, direct-drive wind turbines have higher efficiency and reliability and cheaper maintenance costs than typically geared wind turbines . However, they require a considerable number of neodymium permanent magnets (NdFeB). Direct-drive wind turbines have a market share of around 20%, which will grow quickly. In such circumstances, the future demand for neodymium for electric vehicles and wind turbines will be significant.

Praseodymium (Pr)

Praseodymium is one of the rare earth metals used in wind turbines. The generator mostly uses it as a permanent magnet. Only two forms of ore, monazite and bastnasite, contain praseodymium, which may be found in China, the United States, Brazil, India, Sri Lanka, and Australia. The annual production of this element is at 2500 mt, with 2 million tonnes of reserves globally.

Terbium (Tb)

Terbium is also a rare earth metal used in wind turbines. Terbium is not a very uncommon metal, but it is rare in the sense of supply and demand. It has become even more difficult to find after the discovery of being a critical factor of renewable energy products.

Zinc (Zn)

Soil is easily polluted by zinc mining and smelting activities. Previous research has demonstrated that soils and plants adjacent to mining areas are heavily polluted with lead (Pb), cadmium (Cd), and, to a lesser extent, zinc (Zn) and copper (Cu). Concentrations of heavy metals in polluted soils mostly exceed soil quality criteria III according to national standards (GB 19618-1995 China), and those polluted lands are no longer appropriate for agricultural production. Zinc mining emits 0.58 tonne of CO_2 into the environment per mined tonne of zinc.

Many reports have documented the direct and indirect health effects of multiple heavy metal pollutants in China. Lead and cadmium are the prominent human health hazards of zinc mining. Exposure to these materials leads to high blood lead levels in children as well as malacosteon, kidney damage, and relatively complex cancers.

The mines of Bayan Obo are the largest deposits of rare earth metals yet found and are responsible for 45% of global rare earth metal production. In the outskirts of Baotou, China's Inner Mongolia autonomous province, what could look like a vast lake with multiple streams from the air is a murky stretch of water where neither fish nor algae can grow on the ground. Nearby, factories dump chemicals-laden water into this vast 10-square-kilometer tailings pond, which generates the world's 17 most sought-after minerals, the rare earth metals. If ingested, this hazardous water causes pancreatic and lung cancer, as well as leukemia.

The work conditions in South Africa's Platinum Group Metals (PGM) mines result in environmental pollution and health concerns. Moreover, some African mines release toxic waste into the water streams, resulting in polluted drinking water for nearby villages and animals. As a result, for nearby villages, their only option for fresh water is to buy bottled water.

Further, according to some estimations, China illegally mined 12.3–17.0 kt of neodymium resources in 2016, accounting for 40.5–41.4% of China's neodymium market. From the standpoint of MFA, this study verifies the earlier estimation of illicit rare earth elements minerals.

Zinc mining and smelting activities may quickly contaminate the soil. Cadmium and, to a lesser degree, zinc, and copper extensively contaminate soils and plants around mining regions. Heavy metal concentrations in contaminated soils often exceed soil quality criterion III, according to national regulations (GB 19618-1995 China), and the lands become no longer suitable for agricultural development.

In April 2014, the researchers collected soil, house dust, and river water samples in the town of Jinding, near the Myanmar border, and sent them to an independent laboratory for analysis. The findings indicated cadmium concentrations up to 142 times the national health threshold and lead concentrations up to eight times the norm, indicating that the soil is unsafe for food production.

Aluminium is one of the major contributors to water contamination, owing to its vast natural occurrence and industrial use. Aluminium is hazardous to creatures like fish and invertebrates in the aquatic environment that breathe via their gills because it causes them to lose their osmoregulatory function.

Pollution from wastewater related to mining (ore-dressing) and smelting poses a significant threat to aquatic bodies around zinc mining companies. According to research, heavy metal concentrations in contaminated water bodies typically exceed water quality threshold V set by national regulations (GB 3838-2002 China). Zinc and cadmium are the primary contaminants. Most pollutants are deposited in or absorbed by sediments, which can be a secondary source of contamination in the ecosystem.

According to the Chinese Society for Rare Earth, 1 tonne of rare earth ore produces 9600 to 12,000 m^3 of flue gas comprising of hydrogen fluoride, sulfur dioxide, and sulfuric acid, as well as around 75 m^3 of acidic wastewater, which is dumped into Baotou lakes. The Yellow River is incredibly polluted due to the leakage from such lakes.

Another material that is hazardous to the life below water is manganese since the waste created by its production is thrown into the sea. Manganese compounds exist naturally in the environment as solids in the soils and small particles in the water; however, they can be toxic if the creatures get exposed to high concentrations.

Establishing aluminium mines, both open and underground, has long-term consequences for plant and animal life. Clear-cutting forests and grasslands cause biodiversity loss, habitat destruction, carbon emissions, and erosion. This happens in countries such as India, Brazil, and China. Due to environmental damage, many refineries have been shuttered in nations like China and Brazil. For example, the Xinfa Group's Jiaokou alumina refinery shut down in Shanxi due to the refinery's dumping of red mud in Xiaoyi city, which contaminated the surrounding river system and crops .

Figure 9 Rio Tinto's Red Mud waste dump west of Gladstone

Furthermore, another material, boron, is utilized in manufacturing wind turbines, having a significant environmental impact. Boron mining pollutes the air and the water, degrading the surrounding landscape and destroying animal habitat.

The establishment of copper mines also affects life on land since abundant land is needed, which means deforestation is also necessary. The consequences of deforestation are habitat destruction, erosion, and biodiversity loss. Moreover, the dust that mines create is later inhaled by animals, causing problems with their respiratory system. [59]

"There are two primary methods for REE mining, both of which release toxic chemicals into the environment. The first involves removing topsoil and creating a leaching pond

[59] Trade-offs of wind power production: A study on the environmental implications of raw materials mining in the life cycle of wind turbines

where chemicals are added to the extracted earth to separate metals. This form of chemical erosion is common since the chemicals dissolve the rare earth, allowing it to be concentrated and then refined. However, leaching ponds, full of toxic chemicals, may leak into groundwater when not properly secured and can sometimes affect entire waterways.

The second method involves drilling holes into the ground using polyvinyl chloride (PVC) pipes and rubber hoses to pump chemicals into the earth, which also creates a leaching pond with similar problems. Additionally, PVC pipes are sometimes left in areas that are never cleaned up.

Both methods produce mountains of toxic waste, with high risk of environmental and health hazards. For every ton of rare earth produced, the mining process yields 13kg of dust, 9,600-12,000 cubic meters of waste gas, 75 cubic meters of wastewater, and one ton of radioactive residue. This stems from the fact that rare earth element ores have metals that, when mixed with leaching pond chemicals, contaminate air, water, and soil. Most worrying is that rare earth ores are often laced with radioactive thorium and uranium, which result in especially detrimental health effects. Overall, for every ton of rare earth, 2,000 tons of toxic waste are produced."[60]

None of the cumulative land area and ecosystems and biodiversity impacts of extensive mining for the materials required for renewable energy are addressed satisfactorily in life cycle emissions assessments – see below.

[60] Not So "Green" Technology: The Complicated Legacy of Rare Earth Mining

MINING IMPACTS ON BIOSPHERE, ECOSYSTEMS, BIODIVERSITY

The much expanded need for critical minerals as well as fossil fuels for the "Net Zero transition" will necessarily impact on many areas of wilderness, remaining biodiversity areas, and ecosystems. The emissions cost of this is not factored into the "embodied emissions costs" of materials for net zero VRE and infrastructure.

Only recently have we seen any attempt made to assess biomass loss from mining. The need to adhere to the faith of renewables is still such that there is no objective acknowledgement that in reality the extra mining effort required is counterproductive to reaching "Net Zero". Just that "better planning is required", which in reality rarely has happened anywhere.

"Global nickel demand is projected to double by 2050 to support low-carbon technologies and renewable energy production. However, biomass carbon emissions from clearing vegetation for nickel mining are rarely included in corporate sustainability reports or considered in mineral sourcing decisions. Here, we compiled data for 481 nickel mines and undeveloped deposits to show that **the footprint of nickel mining could be 4 to 500 times greater than previously reported** (depending on the mine site), and thus the environmental impacts of nickel products, including batteries, have been underestimated to date. We found large variation in biomass losses among mines, and, in many cases, these unaccounted carbon emissions were significant relative to other Scope 1 and Scope 2 emissions from nickel extraction and processing. Reporting emissions from biomass losses from mining is key for strategic decision making on where to source nickel needed for effective climate action."[61]

If Nickel is any indication, if we are to multiply the overall carbon footprint of wind turbines by even 4 times, then that massively increases the emissions of wind energy out of the water as well. Let alone 500 times! There is no "decarbonisation" with renewable energy.

"*Mining potentially influences 50 million km^2 of Earth's land surface, with 8% coinciding with Protected Areas, 7% with Key Biodiversity Areas, and 16% with Remaining Wilderness. Most mining areas (82%) target materials needed for renewable energy production, and areas that overlap with Protected Areas and Remaining Wilderness contain a greater density of mines (our indicator of threat severity) compared to the overlapping mining areas that target other materials. Mining threats to biodiversity will*

[61] Biomass carbon emissions from nickel mining have significant implications for climate action

increase as more mines target materials for renewable energy production and, without strategic planning, these new threats to biodiversity may surpass those averted by climate change mitigation."[62]

Expanded mining for renewable energy will likely decimate remaining biodiversity and biosphere, and with it, cause further loss of carbon sequestration and climate impacts. It is frankly ludicrous to suggest that the extra emissions of this, the loss of carbon sequestration and other climate-regulating functions will help the climate.

"*New research has found that 4,642 species of vertebrate are threatened by mineral extraction around the world through mining and quarrying, and drilling for oil and gas*.

Mining activity coincides with the world's most valuable biodiversity hotspots, which contain a hyper-diversity of species and unique habitats found nowhere else on Earth.

The biggest risk to species comes from mining for materials fundamental to our transition to clean energy, such as lithium and cobalt – both essential components of solar panels, wind turbines and electric cars.

Quarrying for limestone, which is required in huge amounts for cement as a construction material, is also putting many species at risk.

The threat to nature is not limited to the physical locations of the mines - species living at great distances away can also be impacted, for example by polluted watercourses, or deforestation for new access roads and infrastructure.

The researchers say governments and the mining industry should focus on reducing the pollution driven by mining as an 'easy win' to reduce the biodiversity loss associated with mineral extraction."[63]

The scientists were of course not able to say that the mining will do more climate harms than good, and that the underlying problem is overshoot of planetary boundaries. We will push many species to extinction in this ridiculous quest for "Net Zero" which will instead increase climate impacts, when she should be instead acknowledging that we need to stop increasing energy demand and degrow.

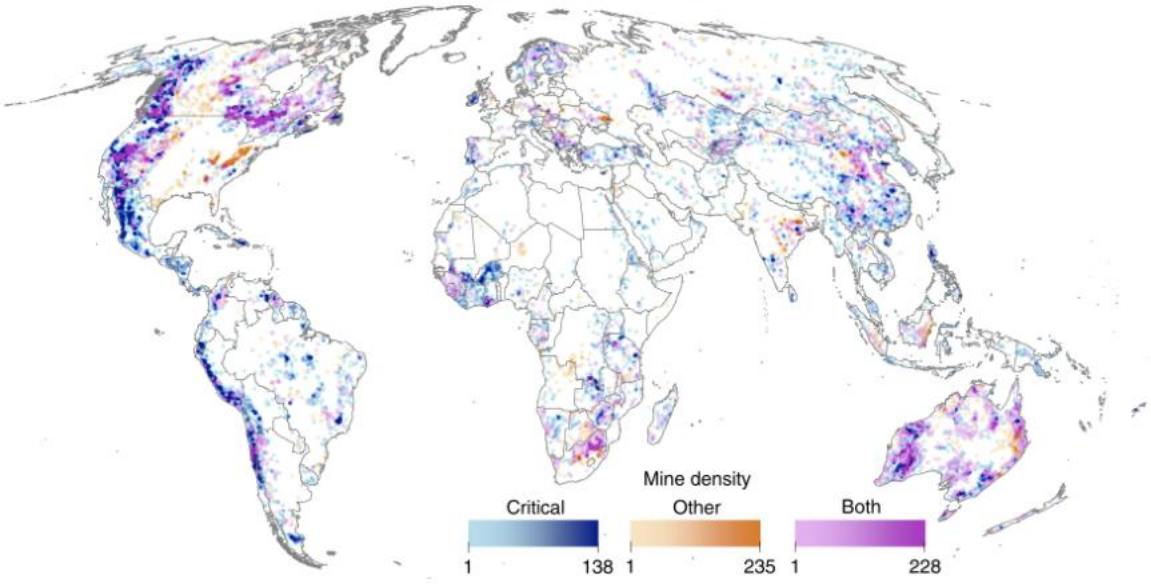
There are a myriad issues with the narrative that renewable energy represents "green" or "clean" or "renewable" or "sustainable" energy[64][65]; scientists have identified numerous individual issues but none have had the integrity or motivation to collate all impacts and make the frank and justifiable assessment that the cumulative environmental and climate adverse impacts of renewable energy clearly outweigh any perceived benefit

[62] Renewable energy production will exacerbate mining threats to biodiversity
[63] Thousands of birds and fish threatened by mining for clean energy transition
[64] Surprising science — There's no such thing as clean energy
[65] Energy and Climate Policy—An Evaluation of Global Climate Change Expenditure 2011–2018

and the “emissions reductions” are purely illusory when all factors are considered. No-one would argue that continued fossil fuel usage is justifiable in terms of climate and biosphere impacts, but no-one seems to want to admit to the true nature of historical overshoot of planetary boundaries, and our civilisation’s economic[66] and agricultural[67] dependence, and indeed renewable energy’s total dependence, on fossil fuels. We have no choice but to degrow, and this will happen whether we like it or not. Rampant destruction of the biosphere for renewable energy as well as agriculture and other impacts will see to it that climate change is hastened, and collapse will happen more quickly.

Fig. 1: Global mining areas and their density.

From: Renewable energy production will exacerbate mining threats to biodiversity



Mining areas were mapped using a 50-cell radius around 62,381 pre-operational, operational, and closed mining properties. Mining areas with properties targeting materials critical for renewable energy technology and infrastructure are shown in blue, areas with properties targeting other materials are shown in orange, and those targeting both commodity types are shown in pink. Color shading (light to dark) indicates the density of mining areas—i.e. the number of mining properties within a 50-cell radius of each 1 km cell.

Electric Vehicles

Electric Vehicle adoption essentially multiplies and broadens the environmental impacts of renewable energy and will contribute more to biosphere destruction through mining and mining waste and non-recycled wastes. The demand for deep sea mining is yet another environmental cost of such an endeavour, which will release more

[66] An objective take on energy policy and the environment
[67] Eating Fossil Fuels

emissions due to disturbance of blue carbon sediments, as well as disturb and compromise previously untouched ecosystems.

For 25-50% of the global car fleet to become EVs by 2050, it would need 18-20x the amount of today's lithium, 17-19x the cobalt, and 28-31x the nickel. That will lead to a huge increase in emissions. Narratives that this would be of net environmental benefit due to less fossil fuels being burned for energy generation, ignore the environmental and climate costs of massively expanded mining, dependent on fossil fuels, and increasingly higher energy demands of mining due to increased overburdens and declining grades, and inefficient energy-costly and expensive recycling efforts, as well as environmental degradation and destruction causing biomass emissions and foregone loss of carbon sequestration.

Indonesia and the Downside of Increased Investment

"With the establishment of the ecosystem, it is hoped that Indonesia can enter the global supply chain of EVs." Joko Widodo, President of Indonesia, September 2023

"We're not opposed to investors, but the [bauxite mining] company's presence here is impacting the environment." Kristop, head of a local village in Indonesia

Indonesia is the sixth-largest producer of bauxite in the world, producing 20 million metric tons in 2023. Much of the bauxite is used domestically, but Indonesia is one of the top exporters in the world, shipping $623 million, or 17.8 billion kilograms, to the world in 2022 alone. Bauxite mining is expected to expand in Indonesia further, as the government has set a national goal to produce 600,000 electric vehicles by 2030, which would represent a 10,000% increase from what Indonesia was able to manufacture in the first half of 2023. To accomplish this goal, Indonesia has implemented many new policies over the past several years. Recently, it banned the export of unprocessed bauxite in 2023, following a similar ban on the export of nickel ore in 2020, in order to force corporations to process the minerals domestically. Indonesia has also streamlined the business permitting process and repealed popular environmental and labor laws to incentivize investment, including eliminating the requirement for environmental impact studies for select foreign investments and changing minimum wage laws.23 In addition, the country passed a new regulation that would provide tax incentives "to companies that have invested in EV plants, are planning to increase their EV investments, or planning to invest."

Indonesia has also passed laws restricting public criticism and protests against mining companies. One such law states that "anyone who hinders or disturbs mining activities by permit holders who have met the requirements ... may be punished with a maximum prison term of one year and maximum fines of 100 million rupiah [$7,000]." Initially seen as a warning, it has been used in practice to silence criticism. In 2021, 10 people were charged with violating this specific provision, out of 53 total people accused of opposing

mining companies. ***These government regulations not only lowered labor standards, but the increased mining has had a negative impact on the environment as well. In West Kalimantan, Indonesia, in the southern island of Borneo, bauxite mining is booming, with one mine expanding by 2,144 hectares since 2017. Just about 1,500 of those hectares were forest.*** *According to local reports, "Some people, especially children, have developed rashes and boils, which they attribute to heavy metals polluting rivers and streams" from the mines in West Kalimantan. Moreover, the provincial governor blamed the mines' impact on environmental degradation for causing, or at least exacerbating, deadly floods in 2020.*

*In addition to deforestation, air quality has also suffered under bauxite mining****. At the end of 2022, Indonesia had 18.8 gigawatts of coal power plants under construction, which is more than all other countries except China and India. Much of the new construction is tied to electric vehicle battery production.*** *In one example, Chinese aluminium producer Shandong Nanshang announced that it would invest $6 billion to expand its aluminium production on the island of Bintan. The company relies on coal to power its current facility, which accounts for about 43% of Indonesia's electricity grid.* ***The company is reportedly planning to construct 31 additional coal-fired power plants in the coming years****. It has announced plans to build a solar power facility to switch to green energy at some point in the future, but only after Indonesia promised the company a full waiver of income tax for the next two decades."*[68]

VIABILITY OF NET ZERO IN TERMS OF AVAILABLE MINERALS AND DECLINING GRADES

Simon Michaux has performed a comprehensive assessment of the minerals required to attempt to completely replace fossil fuels[69]. His assessments have revealed that for many required minerals either insufficient reserves exist, or insufficient mining effort exists, which cannot be realistically upgraded to the production of minerals required.

[68] The Impact of the Bauxite Boom on People and Planet

[69] Quantity of Metals Required to Manufacture One Generation of Renewable Technology Units to Phase Out Fossil Fuels

Total metals required for one generation of technology to phase out fossel fuels			
Metal	Required Production (tons)	Known Reserves (tons)	Comment
Copper	4,575,523,,674	880,000,000	Reserves cover 20% of requirements
Cobalt	218,396,990	7,600,000	Reserves cover 3.48% of requirements
Graphite	8,973,640,257	320,000,000	Reserves cover 3.57% of requirements
Lithium	944,150,293	95,000,000	Reserves cover 10% of requirements
Manganese	227,889,504	15,000,000,000	Adequate reserves
Nickel	940,578,114	95,000,000	Reserves cover 10% of requirements
Silicon (metal)	49,571,460		Adequate reserves
Silver	145,579	530,000	Adequate reserves
Vanadium	681,865,986	24,000,000	Reserves cover 3.52% of requirements
Zinc	35,704,918	250,000,000	Adequate reserves
Zirconium	2,614,126	70,000,000	Adequate reserves

Metal	Element	Total metal required produce one generation of technology units to phase out fossil fuels (tonnes)	Global Metal Production 2019 (tonnes)	Years to produce metal at 2019 rates of production (years)
Copper	Cu	4 575 523 674	24 200 000	189,1
Nickel	Ni	940 578 114	2 350 142	400,2
Lithium	Li	944 150 293	95 170 *	9920,7
Cobalt	Co	218 396 990	126 019	1733,0
Graphite (natural flake)	C	8 973 640 257	1 156 300 ♦	3287,9
Graphite (synthetic)	C		1 573 000 ♦	-
Silicon (Metallurgical)	Si	49 571 460	8 410 000	5,9
Vanadium	V	681 865 986	96 021 *	7101,2
Rare Earth Metals	-			
Neodymium	Nd	965 183	23 900	40,4
Germanium	Ge	4 163 162	143	29113,0
Lanthanum	La	5 970 738	35 800	166,8
Praseodymium	Pr	235 387	7 500	31,4
Dysprosium	Dy	196 207	1 000	196,2
Terbium	Tb	16 771	280	59,9

* Estimated from mining production. All other values are refining production values.
♦ Natural flake graphite and synthetic graphite was combined to estimate total production

In addition, declining grades of almost all minerals, and reserves which are increasingly difficult to mine, will mean that Net Zero globally is just not possible. "*Mining's carbon footprint is influenced by multiple interconnected factors. The type of mineral being extracted plays a crucial role, as different materials require varying amounts of energy to mine and process. Ore grade is another critical factor; as grades decline, more energy is required to obtain the same amount of valuable minerals. Processing requirements vary significantly, with complex ores demanding more intensive treatment methods.*"[70]

[70] Decarbonizing the mining industry: Challenges and opportunities on the path to net zero

Therefore, as grades decline, embodied materials emissions increase further, meaning the carbon footprint of renewable energy and associated infrastructure increases further.

"*The decline in ore grades poses significant global challenges, driving higher energy demand and extraction costs in the mining sector. Processing lower-grade ores requires more energy and material input per unit of metal produced, leading to increased emissions and environmental impacts. This not only amplifies the footprint of renewable energy technologies but also raises the overall production cost, particularly under energy-intensive conditions. As demonstrated by Magdalena (2024), a decrease in the cut-off grade further intensifies these effects, as it expands the volume of material processed for the same metal yield.*"[71]

WASTE

In addition to all the other environmental problems described above, renewable energy has a massive waste problem, despite intermittent articles in mainstream media describing how components *can potentially* be recycled or reutilised.

Most solar panels end up in landfills as do wind turbines, whose large blades are a major factor in their disposal. [72]

"*In 2020, the cumulative retired batteries in China reached 200,000 tons (about 25-gigawatt hours) and is expected to increase to 780,000 tons (about 116-gigawatt hours) by 2025—a multiple of almost 4 in just 5 years. Over half of those retired batteries are not recycled properly and instead are sold to small factories at high prices, who are not expected to dispose of them in an environmentally sound fashion.*

According to Professor Wu Feng at Beijing Institute of Technology, "A 20-gram cell phone battery can pollute three standard swimming pools of water, and if abandoned on the land, can pollute 1 square kilometer of land for about 50 years." Compared to cell phone batteries, the pollution caused by the batteries of electric vehicles is far greater. Electric vehicle batteries contain cobalt, manganese, and nickel, which do not degrade on their own. Manganese, for example, pollutes the air, water, and soil, and more than 500 micrograms per cubic meter in the air can cause manganese poisoning.

Another major source of pollution in lithium-ion batteries is the electrolyte. The lithium hexafluorophosphate in the electrolyte is hydrolyzed in the air to produce phosphorus pentafluoride, hydrogen fluoride, and other harmful substances, which is a major threat to soil and water resources. Phosphorus pentafluoride is a strong irritant to human skin,

[71] Assessing the role of renewable energy in mitigating the impacts of declining ore grades in mining
[72] Green Technologies Cause Massive Waste and Pollution

eyes, and mucous membranes, and is also a very reactive compound that hydrolyzes in humid air to produce toxic and corrosive white fumes of hydrogen fluoride."

"*Decommissioning wind turbines includes the removal of all physical material and equipment related to the project to a depth of about 48 inches. Most of the concrete foundations used to anchor the wind turbines, however, are as deep as 15 feet. The concrete bases are hard to fully remove, and the rotor blades contain glass and carbon fibers that give off dust and toxic gases. While most (90 percent) of a turbine can be recycled or be sold to a wind farm in Asia or Africa, researchers estimate the United States will have more than 720,000 tons of blade material to dispose of over the next 20 years, a figure that does not include newer, taller higher-capacity wind turbines.*

Wind turbine blades are made of a tough but pliable mix of resin and fiberglass—similar to what spaceship parts are made from. Decommissioned blades are difficult and expensive to transport. They can be anywhere from 100 to 300 feet long and must be cut up on-site before getting trucked away on specialized equipment to a landfill that may not have the capacity for the blades. Landfills that do have the capacity may not have equipment large enough to crush them. One such landfill cuts the blades into three pieces and stuffs the two smaller sections into the third, which is cheaper than renting stronger crushing machines.

In Minnesota, Xcel Energy estimates conservatively that it will cost $532,000 (in 2019 dollars) to decommission each of its wind turbines—a total cost of $71 million to decommission the 134 turbines in operation at its Noble facility. Decommissioning the Palmer's Creek Wind facility in Chippewa County, Minnesota, is estimated to cost $7,385,822 for decommissioning the 18 wind turbines operating at that site, for a cost of $410,000 per turbine."

This huge waste burden is set to rise and there is absolutely no end in sight. Is this trajectory not a massive problem?

Reducing the cost of meeting emissions targets

Draft recommendation 1.1

Reducing emissions in the electricity sector after 2030

Governments should prioritise introducing enduring, broad-based market settings in the electricity sector beyond 2030. The settings should:

• create nationally consistent incentives for lowest-cost clean energy, irrespective of generation technology or jurisdiction

• embed investment incentives to ensure reliability and system security are maintained. Governments should also phase out any jurisdictional- and technology-specific incentives over time.

RESPONSE

(2) "Lowest Cost Clean Energy"

The implied claim that wind and solar represent "lowest cost clean energy" is incorrect because, as I outlined above, they are not "clean" nor are they "green" in terms of upstream emissions and environmental impacts, deployment emissions and environmental impacts, and downstream (waste) emissions and environmental (decommissioning) impacts.

In terms of costs, the fact that (1) they require heavy government subsidisation, and without that, tenders dry up, is strong circumstantial evidence that they are not "low cost" economically[737475].

In fact, numerous facets of these industries which cause emissions to be increased or even multiplied over what is conventionally accepted are also causes of their increased costs; these are:

- Requirement for vast amounts of new high voltage transmission, the costs of which are borne not by the billionaires and foreign investors behind renewables projects, but by taxpayers and consumers; costs for these have blown out dramatically[7677]
- Requirement for expensive and short-term electricity storage facilities (expected lifespan 10-15 years)

[73] Dutch postpone wind farm tenders due to low interest without subsidies
[74] Counting the Cost: Subsidies For Renewable Energy
[75] Germany Gets No Bids in Zero-Subsidy Offshore Wind Auction
[76] CopperString transmission line projected to cost almost $14b amid massive blowout
[77] From $650m to $5.5b: Massive blowout for renewables zone

- Requirement for pumped hydro projects which can be monumentally expensive (as well as environmentally devastating – see Snowy Hydro 2[78])
- Requirement for massive overbuild of renewable energy generation facilities in order to address the problems of variability and intermittency, and to replenish storage capacity; the resultant overbuild causes emissions per unit generation facility to spiral upwards, and also cause overall systems costs to increase
- Requirement for an additional and parallel energy generation system to act as back up in case of failure of the wind and solar dominated system – this fossil fuel reserve generation system needs to have similar capacity to total VRE capacity to prevent black-outs in case of "dark doldrums" type weather events and generation failures due to other reasons.
- If renewable energy producers have to pay upfront for full site decommissioning and rehabilitation - $500 000, probably $1 million by the time that many current new wind farms will be decommissioned, per turbine, it is doubtful that there would any investment in wind farms. The wind farm operators clearly expect to dodge that cost by the time the wind farms are decommissioned, on-selling them to other companies or shell companies, which will go bankrupt to avoid decommissioning costs. Approval conditions of wind farms normally state that the vegetation must be returned to "pre-clearing" state. This is simply impossible due to the environmental impacts on the surrounding ecosystems and soils within the allocated timeframes, and attempting to do so will be expensive.

Modelling of attempted replacement of current grid electricity with wind and solar and storage reveals need for a massive overbuild – 144GW of generation according to these authors[79]. They also claim the need for 45GW of storage, all in order to replace on average 27GW of generation as it was when the paper was written. However, these are **likely gross underestimates** due to curtailment and capacity credit considerations, which even affects replenishment of storage due to possible grid curtailment. If there is no generation at night, hypothetically, the total storage capacity will only supply the total grid for 2 hours. This seems grossly inadequate and assumes that the storage has been totally replenished at the start of those two hours, which in reality is extremely unlikely.

"Continuing with round numbers, if the system is to be operated only on wind, solar and hydro power, with energy shuffled in and out of large and small storage assets and devices, the generation cost averaged across the energy for the total interconnected system will approach $200/MWh (20c/kWh) or more. The additional costs in the

[78] Snowy Hydro expansion hits reset button as costs blow out to $12 billion
[79] Computation of storage power and energy to stabilize a wind-and-solar-only Australian National Electricity Market grid

transmission and distribution systems will be far higher than for the historical coal-based and the current increasingly gas-price exposed system.

In other words, the further the system moves away from the inherited generation system in the coal-based '$50 cost zone' through the gas-based '$100 cost zone' and towards the wind- and solar-based '$200 cost zone,' the more the actual outcomes for final consumers are likely to escalate to even higher price levels. The underlying economic problem remains even if cost of living price relief shifts costs from electricity bills to the tax-and-welfare system."[80]

ROBERT ONFRAY, makes some very good and relevant points:

"I am not sure many people are fully aware of the massive engineering changes currently underway in our rural landscape. The changes are on a scale never attempted in this country before, and it is swallowing obscene amounts of money for minimal benefit and, indeed, no proof it will improve the climate.

If you only listen to Prime Minister Anthony Albanese, the Minister for Climate Change and Energy Chris Bowen, or even the mainstream media, then you would be excused into thinking that the renewable energy transition is achievable, cheap, seamless, wholly affordable and essential for our contribution to prevent a "climate catastrophe".

As Nick Cater writes:

"*They have invested a primitive faith in power from wind, water and sun that defies logical argument. They have convinced themselves that renewable resources are free and inexhaustible, ignoring the tendency of wind and solar to gobble land and capital".*

..."Wind Turbine and solar panel-generated power is the wrong technology for the 21st century for all the reasons we already know about – they are dispersed, intermittent, unreliable, have a short service life, are materially intensive, have low output, and are damaging to the environment and our health. They simply cannot be relied upon for a modern economy.

It is undeniable that current Net Zero plans are astronomically costly, technologically impossible and politically unstable.

The Net Zero mantra is an energy policy that "rejects the good in favour of the unworkable". Labor's false market is protected from competing technologies like nuclear and is in crisis. It is not designed to achieve Net Zero. Its legacy will ensure Australians pay more and more for unreliable energy for decades, as a lack of political support stifles other avenues like nuclear.

[80] The Ruinous Cost of Free Energy

Implementing an overly ambitious emissions reduction scheme will only lead to further price increases and less reliability while our only baseload energy sources are suppressed.

Continued price controls and other regulatory interventions by the government will see the further decline of energy-intensive manufacturing and a slippery journey into a moribund world of lower living standards and productivity losses.

We risk seeing the contemporary green economy reverting to old-fashioned protectionism and increased state power. Pumping trillions of dollars to accelerate the energy transition magnifies the illusion of promised economic benefits."[81]

Mark Mills writes:

"For the longer term, policymakers might take heed of the reality that a goal of "net-zero" will require new technologies that don't exist today. That reality points to the need for a greater focus on basic scientific research. Unfortunately, that path doesn't have a "predictor function" and one cannot, in effect, order up elusive breakthrough technologies. One can imagine but not predict when someone will discover, for example, a low-cost, room-temperature superconductor that would make storing electricity as easy and cheap as storing petroleum, or a metamaterial that synthesizes hydrogen at a scale and cost rivalling natural gas.

***Based on today's physics and technology, the only path to an energy system with a material intensity lower than hydrocarbons would be one focused on nuclear fission**. In the pantheon of energy-producing machines, none is more remarkable than the nuclear reactor. Nuclear fission offers a potential hundredfold reduction in material intensity over combustion, and a thousandfold reduction over solar and wind. Here too, though, even if policies are implemented that are conducive to a nuclear renaissance, meaningful expansion will take decades longer than the rapid transition timelines popular today.*

*The material realities associated with solar, wind, and storage technologies do not obviate an expanded, or even a substantial, role for these energy systems. However, believing that such technologies make possible a rapid and wholesale replacement of fossil fuels ignores the underlying physics, engineering, and **economics**. Even more troublesome, putting so much effort and money into those technologies will lead the world down a path that won't meet targets to reduce carbon dioxide emissions, but **would cause massive collateral damage to economies and the environment**. If Feynman were alive today, one suspects he would repeat another of his favoured*

[81] Wake up Australia – Renewable energy won't save the planet if it costs the earth: Robert Onfray

aphorisms: "For a successful technology, reality must take precedence over public relations, for nature cannot be fooled."[82]

An analysis of Germany's attempt to reduce emissions mainly via wind and solar after closing down nuclear power stations on ideological grounds, showed that emissions-reduction would have been far more effective had they simply transitioned to nuclear, and it would have been far less expensive (see next paragraph). Worse than that, Germany has expanded its biomass energy production and is supplying some energy via the burning of carbon in forest trees. And Germany also brought coal generation back temporarily when the Ukraine War curbed their supply of natural gas. And it seems to this day, they still rely on coal generation as reserve for wind and solar! "*Germany's power plants run on hard coal remain an important back up to guarantee supply when volatile wind and solar power are not available, coal importers lobby VDKi said in a statement on Thursday, calling for better remuneration."" "Modern hard coal plants are an important backbone of German power grids," said VDKi chairman Alexander Bethe in a statement issued ahead of a reception on Friday. Germany has 16 gigawatts (GW) of hard coal capacity left that contributed 5.4% of all power generated in 2024, according to industry group BDEW."*[83]

"Germany has one of the most ambitious energy transition policies dubbed 'Die Energiewende' to replace nuclear- and fossil power with renewables such as wind-, solar- and biopower. The climate gas emissions are reduced by 25% in the study period of 2002 through 2022. By triangulating available information sources, the total nominal expenditures are estimated at EUR 387 bn, and the associated subsidies are some EUR 310 bn giving a total nominal expenditure of EUR 696 bn. Alternatively, Germany could have kept the existing nuclear power in 2002 and possibly invested in new nuclear capacity. The analysis of these two alternatives shows that Germany could have reached its climate gas emission target by achieving a 73% cut in emissions on top of the achievements in 2022 and simultaneously cut the spending in half compared to Energiewende. Thus, Germany should have adopted an energy policy based on keeping and expanding nuclear power."[84]

The lowest cost low carbon energy system is nuclear energy, and it would provide the best environmental and climate outcome. It would also provide the best economic outcome.

If the Productivity Commission was to provide research of the highest integrity and standard, this is what they would be advising the ALP Government. Instead, it seems

[82] The Hard Math of Minerals
[83] German coal plants vital for electricity supply, importers say
[84] What if Germany had invested in nuclear power? A comparison between the German energy policy the last 20 years and an alternative policy of investing in nuclear power

that their brief was providing the ALP Government with a report which is precisely aligned with ALP policy and narratives.

WEALTH TRANSFER

Another issue which relates to productivity is circulating money in the economy. If substantial amounts of money are provided by consumers and taxpayers to be funnelled into the pockets of billionaires and wealthy foreign corporations and investors, surely that is bad for productivity?

There is no doubt that the renewable energy landscape is dominated in Australia by a multitude of foreign companies, all in a rush to cash in on power generation and storage. None would be investing upfront moneys in infrastructure and approvals if they considered the investment was not lucrative and was high risk. Essentially the government is underwriting these investments through the Renewable Energy Certificates and the Capacity Investment Scheme.

Consumer electricity prices are also increasing dramatically due to the increased penetration of renewable energy in the grid. There is no doubt about this. If consumers are spending more money on power bills, they have less money to spend on other facets of the economy. That must surely also lessen productivity.

In addition, in effect, wealth is being transferred from the poorer sectors of society to the rich, both in Australia and offshore. Power bills are proportionally an increased cost for the less well off. The wealthy can much more easily accommodate them. Many subsidies, for example on EVS and home solar panels and battery storage, are designed to lessen the cost of these, but it is only the relatively well off who are able to afford them. They are the beneficiaries of them and all others still have to subsidise them.

“**Green Energy: Greatest Wealth Transfer to the Rich in History**

We are in the midst of history’s greatest wealth transfer. Government subsidized wind systems, solar arrays, and electric vehicles overwhelmingly benefit the wealthy members of society and rich nations. The poor and middle class pay for green energy programs with higher taxes and higher electricity and energy costs.

Developing nations suffer environmental damage to deliver mined materials needed for renewables in rich nations. Since 2000, the world has spent (h□ps://www.fs-unep-centre.org/global-trends-in-renewable-energyinvestment-2020/) more than $5 trillion on green energy. More than 300,000 wind turbines have been erected, millions of solar arrays were installed, more than 25 million electric vehicles (EVs) have been sold, hundreds of thousands of acres of forest were cut down to produce biomass fuel, and about three percent of agricultural land is now used to produce biofuel for vehicles. The

world spends about $1 trillion per year on green energy. Government subsidies run about $200 billion annually, with more than $1 trillion in subsidies spent over the last 20 years."[85]

CORRUPTION

Corruption is a known drag on economic performance and productivity. Globally it is estimated to cost economies 5% GDP.

"*Research by the International Monetary Fund found that a rise or fall in Transparency International's Corruption Perceptions Index (CPI) has a corresponding impact on a country's economic performance.*

As Australia's CPI score has plummeted over the past decade – earlier this year Australia recorded its worst ever result – this may have had a significant impact on our budget bottom line.

Recent analysis by the University of Melbourne's Fellow in Historical Studies, Tony Ward, revealed that if Australia had the same CPI score as we did in 2012, we would enjoy GDP per capita growth of 2.2% over the next few years instead of Treasury's forecast 1.6%.

This extra 0.5% growth would generate an extra 60,000 jobs a year.

Professor Ward's analysis suggests Australia's 12-point decline in Transparency International's corruption score is costing the Australian economy some 0.5% of GDP, or $10 billion a year.

It's an economic impact that has a profound, if not visible, impact on our lives.

It is revenue that could have gone towards greater flood mitigation measures or a more generous disaster preparedness and recovery program."[86]

So in Australia corruption is assumed to cost 0.5% per annum. Australia has very limited resources to fight corruption.

Australia's National Anti-Corruption Commission has been hobbled:

"*When the National Anti-Corruption Commission was established, it carried with it the wishes and dreams of the country. They've gone up in smoke.*

Big developments from Australia's corruption busters with news of the National Anti-Corruption Commission's first scalp: a government employee has been banged up for breaking the rules to line up a government job for a close family friend.

[85] Green Energy: Greatest Wealth Transfer to the Rich in History
[86] Please tell this government that fighting corruption is a strategy to boost economic growth

After two years and hundreds of millions of dollars, the NACC's first completed investigation, released yesterday, found a senior Department of Home Affairs manager had acted corruptly when she subverted the hiring rules to help her sister and her sister's fiancé into a plum government job. Don't laugh. There's a stern message here: if you steal a pack of post-it notes from work or take home a government notebook, the NACC's sleuths will hunt you down, find you and prosecute you to the full extent of the law.

Somehow it feels like satire, Canberra's dysfunctional version of The Untouchables. It also feels like a massive disappointment for anyone who had high hopes for the NACC as a white knight of integrity, bringing corrupt politicians to book.

Small beer

Yesterday's "success" serves to underline the NACC's problem: while it pursues a bureaucrat over a questionable selection process, we all know that the former Coalition government appointed dozen upon dozen of its political mates to highly paid government jobs without going through an independent process. Under this arrangement it was possible for a friend of the Coalition to be given a job paying over $350,000 per annum for five years, with no prospect of dismissal. This was cronyism on an industrial scale and it infected a judicial body, the Administrative Appeals Tribunal, so badly that it had to be abolished. One mid-level job in Home Affairs? Call that a knife? In perception terms it just doesn't cut it.

The AAT was but one example of a government which trampled all over due process on everything from appointments to government roles to grants to parliamentary declarations of pecuniary interests. The stench of government misbehaviour was so bad that integrity became a central campaign issue for the community independents in the 2022 election.

Yet so far there has been no accountability on any of this.

Name-dropping

The NACC's venture into the serious issue of robodebt ended in farce, blowing up in the face of Commissioner Paul Brereton like an exploding cigar. An investigation found Brereton had engaged in misconduct by not recusing himself entirely from the decision-making after declaring a "close association" with a person involved. (The NACC also investigated a $2.4 million compensation payment to former Liberal staff member Brittany Higgins and found no case of corruption.)

Even yesterday's announcement of a successful prosecution had its down side. It chose not to name the official involved or hold hearings in public, a decision former judge and now a director of the Centre for Public Integrity Anthony Whealy KC called a dangerous precedent:

"The fact that they don't name the person who's been involved in the corrupt conduct sets an even more dangerous precedent because the whole purpose of making a public report is to expose corruption."

Whealy said the NACC's claim that pseudonyms delivered enough accountability and avoided the risk of identifying witnesses was "hollow":

"It doesn't matter [if] the witnesses' names are revealed before or after a prosecution, it's never been a proper basis for not naming someone."

In case you missed it

The NACC gives little public information but from its website we know it has a handful of cases before the courts, nearly all of which were started by its predecessor, the ACLEI (Australian Commission for Law Enforcement Integrity). They include:

- *a bribe paid to a former tax office official;*
- *a bribe paid to a former employee of the Western Sydney Airport;*
- *money laundering by a member of the Australian Federal Police;*
- *improper actions of a former immigration officer.*

So what big ticket items might be in the pipeline? The NACC has been forced to reopen its robodebt investigation after it received independent legal advice. It has previously said it was examining allegations involving defence contractors, which corruption experts had always considered was a prime area for corruption given the huge amounts of money involved.

At this stage the NACC has failed to meet the great hopes and expectations invested in it. Maybe somewhere in its deep, secret store it will find something more than the theft of paper clips from the office stationery cupboard. Let's hope so. Otherwise, we'll owe a huge apology to the former Coalition government. How could we have got you so wrong?"

So shouldn't the Productivity Commission advise the government that corruption be properly investigated and prosecuted, if their charter states that "**initiates research on economic, social and environmental issues** and reports annually on economic performance, industry assistance and regulation", given that we know that corruption is a big drag on productivity?

Also, it is known that both critical minerals mining and wind energy in offer multiple possibilities for corruption:

MINING CORRUPTION

"*Licensing for mining projects is <u>already</u> vulnerable to corruption.*

And it's not just because of traditional, 'corrupt' jurisdictions that we should have cause for concern. In Transparency International's Accountable Mining Programme, we've been working with Transparency International Chapters in over twenty countries to study the weaknesses in the licensing process – that is in government decision-making about whether or not a mining project goes ahead. We pinpointed where and how those weaknesses open the door to corruption.

What we found was concerning. We found that regardless of how established the mining sector was or how well the country performed in corruption rankings, every jurisdiction we assessed was vulnerable to corruption in some way.

Corruption is a cause for concern because there is so much at stake.

Corrupt mining deals can result in a loss of revenue for producer countries as corrupt politicians and businesspeople siphon off money and award contracts to benefit themselves – robbing citizens of funds that should be there to benefit everyone.

And not only that – corruption is not a victimless crime. Companies that secure their rights to mine through corruption are very unlikely to be responsible mining companies that respect human rights and operate with high levels of integrity.

Corruption in the licensing process can result in women and men in communities being displaced from their land, potentially losing access to key sources of livelihood and sites of cultural heritage. And we know from our research that women will often suffer disproportionately.

So, if we don't take steps to deal with the weaknesses in the licensing process and make it more transparent, accountable and resilient to corruption, then we are putting people and the planet and the whole prospect of a just and people-centred energy transition in jeopardy.

The energy transition is likely to exacerbate corruption risks.

There are three reasons why we are likely to see an increase in corruption risks in relation to critical minerals.

Firstly, the energy transition is a significant opportunity for industry to make money.

What factors increase the risk of corruption in licensing?

Compromised **administrative context**	• Undisclosed and unmanaged conflicts of interest • Weak controls on revolving doors between industry and government • Inadequate regulation on political donations and industry lobbying
Unclear **legal/regulatory process**	• For opening land to mining • Steps in the licencing process & roles and responsibilities • For conducting community consultation
Broad decision-maker discretion (Lack of clear decision-making criteria)	• For granting licences • For environmental approval and licences • For Free, Prior and Informed Consent (FPIC)
Insufficient **institutional capacity** (funding, staff, skills, experience) of licensing agency	• Weak protection of land rights • Delays in processing licence applications • Inadequate due diligence on licence applicants • Inadequate verification of ESIA reports
Poor **access to information**/lack of transparency	• Gaps in mining licence register (cadastre) • Hidden beneficial owners of licence applicants • Accessibility of ESIA report & related docs
Limited opportunities for **public participation**	• Community consultation only occurs with local elites • Agreements are not available to community members

And with the prospect of lucrative projects comes a greater willingness to take on higher risks – including integrity and corruption risks. The reports about the flurry of deal-making in the lobbies of luxury hotels in countries with reserves of critical minerals are perhaps a taste of what is to come.

- *We're seeing **more mining companies willing to operate in jurisdictions that were previously 'too risky'**. With exploration to scout out promising new projects being key, we will also be seeing more junior miners – smaller and usually less risk-averse companies – move into critical mineral producer countries. And we are also seeing consumer companies like electric vehicle manufacturers moving into mining because of pressure to ensure that their minerals are responsibly sourced.*
- *So, what does this mean for corruption risks? It means more companies entering the field that may **not be experienced** when it comes to managing corruption risks, or that **do not have adequate internal safeguards and systems** in place, or that simply **do not care** about corruption. That is naturally going to increase the corruption risks and the chance that the weaknesses in the licensing process will be exploited.*

Secondly, the critical minerals boom is seeing greater state participation.

The energy transition is an opportunity for governments to increase investment and raise important revenue that could be incredibly beneficial for the citizens of that country. However, the increased flows of investment also mean higher corruption risks.

- *There's concern about a **potential 'race to the bottom' in regulatory standards to attract investment** – by fast-tracking the licensing process, giving decision-makers sweeping approval powers, or making it easier for companies to be granted a licence by limiting opportunities for public participation and scrutiny. All of this has negative implications for accountability and increases corruption risks.*
- *Risks related to **local content requirements** is another area to keep an eye on. Governments are increasingly starting to require foreign mining companies to partner with local suppliers, or domestic processors/refineries, or even for part local ownership of the mine. On the one hand, this could be a fantastic opportunity for broader economic development in the country. However, it can be a problem when decision-makers have a conflict of interest and put pressure on mining companies to partner with a favoured local company that has political connections or family ties in exchange for the mining licence.*
- *Greater **involvement of state-owned enterprises** also increases the well-documented risks related to SOE officials including misappropriation of funds, bribery, and deal-making that favours individuals with political connections.*

***Finally, increased demand puts pressure on already stretched institutions**.*

- *Increased workload for under-resourced government departments means **increased risks of bribery** as companies seek to speed up or overcome delays in the licensing process, 'outbid' their competitors for priority access, or get away with fraudulent statements about their qualifications or misleading impact assessments.*

*Also, energy transition minerals and metals are often located in socially and environmentally sensitive areas. Corruption in decisions about these projects means **greater impacts on communities and the environment**, as well as increased corruption risks in company engagement and negotiations with communities about land access and acquisition and free, prior and informed consent (FPIC)."*[87]

WIND ENERGY CORRUPTION

In addition, it has been revealed by many peer-reviewed studies and reviews that wind energy in particular offers multiple avenues for corruption, especially when it is subsidised by governments. This has not been revealed in Australia, but that may well be due to lack of regulatory frameworks and institutions to deal with such corruption, and possible corruption in institutions which should be providing governance and oversight.

[87] Corruption in critical minerals puts the energy transition at risk

"*We show that publicly subsidized renewable energy can attract criminal appetites and favour the formation of criminal associations between entrepreneurs and politicians able to influence the licensing process. The insights of a simple model of political influence by interest groups are tested empirically using Italian data for the years 1990–2007. Using a difference in difference approach we quantify the impact of a Green Certificate policy aimed at supporting renewables and find robust evidence that criminal association activity increased more in windy provinces after the introduction of the generous policy regime. The magnitude of the effect is large: the construction of an average wind park is associated with an increase in criminal activity of 6 % in the treatment compared to the control group. Our findings show that in the presence of poor institutions, even well designed market-based policies can have an adverse impact. The analysis is relevant for countries that are generally characterized by heavy bureaucracies, weak institutions and by large renewable potential."*[88]

"*Corruption Risks Abound*

The development of renewable energy assets is particularly vulnerable to corruption risks due to complex regulatory environments, government involvement, and time pressures to deliver new projects. Activities giving rise to these risks evolve during the lifecycle of the assets but range from obtaining planning concessions and generation licenses to government JV partnerships to importing equipment and material, to name a few."[89]

There seems to be no regulatory body or law enforcement agency tasked with oversight of renewable energy and investigating possible corruption.

STATE-OWNED ENTERPRISES

To make matters worse, state governments have a habit of operating renewables projects and dealing with private and foreign renewable energy companies via government-owned corporations / state-owned enterprises (SOEs), which seems to be a direct ploy to limit transparency and accountability. Most often, governments do deals via SOEs and the details are hidden by "commercial-in-confidence" agreements, and they refuse to divulge information under Freedom of Information frameworks. The OECD and World Bank have published manuscripts identifying the heightened corruption risks of state-owned enterprises and advice on how to minimise corruption risk. Because of significant lack of transparency, one must suspect that many deals may not be "above

[88] Clean or dirty energy: evidence of corruption in the renewable energy sector
[89] The Dirty Side of Going Green: Corruption and Human Rights Risks Within the Clean Energy Supply Chain

board", but because of the total lack of information, it's impossible to gather enough evidence to take any suspicions further. [909192]

The Queensland Government alone has multiple government-owned corporations, many of which have virtually identical functions. One must ask why so many are necessary? Many of them seem to have ex-politicians and bureaucrats in their upper management. This is obvious cronyism.

List of government-owned corporations

Name	Shareholding ministers	Date corporatised (under state GOC Act)	Date converted to company (under federal Corporations Act 2001)
Energy generation			
CS Energy Limited	• Treasurer, Minister for Energy and Minister for Home Ownership • Minister for Finance, Trade, Employment and Training	1 July 1997	
Stanwell Corporation Limited	• Treasurer, Minister for Energy and Minister for Home Ownership • Minister for Finance, Trade, Employment and Training	1 July 1997 (Tarong Energy Corporation Limited converted to a subsidiary of Stanwell Corporation Limited on 1 July 2011)	
CleanCo Queensland Limited	• Treasurer, Minister for Energy and Minister for Home Ownership • Minister for Finance, Trade, Employment and Training	13 October 2018	17 December 2018
Energy transmission			
Queensland Electricity Transmission Corporation Limited (Powerlink Queensland)	• Treasurer, Minister for Energy and Minister for Home Ownership • Minister for Finance, Trade, Employment and Training	1 July 1997	
Energy distribution			
Energy Queensland Limited	• Treasurer, Minister for Energy and Minister for Home Ownership • Minister for Finance, Trade, Employment and Training	30 June 2016	

[90] Guidelines on Anti-Corruption and Integrity in State-Owned Enterprises
[91] The Challenge of Compliance in State-Owned Enterprises
[92] State-Owned Enterprises – Confronting Corruption in Sectors and Functions – World Bank

This list above does not include subsidiaries – for example Yurika is a subsidiary of Energy Queensland Limited. And there are probably others.

COMMUNITY BENEFITS SCHEMES/FUNDS

Another area where bribery and corruption may occur, in the open, is the provision of Community Benefits Schemes or Funds, where renewable energy developers provide moneys to "benefit" the community. Most often via sporting or services clubs, but even citizen science bodies and academics have been recipients of such funding. This funding can be seen as "compensation" or as open bribery. Certainly, it is provided by renewables developers with the intention of reducing resistance and gaining acceptance. In that light, it would seem to constitute bribery.

"*Unfortunately, energy development often operates on or near public resources, with potentially significant impacts on communities and their way of life, wildlife, and ecosystems. As such, the approval, regulation, expansion, and continued operation of these developments are necessarily subject to continued political decision-making. That decision-making will be influenced by community benefit schemes. Even if the schemes are not officially considered, in a democracy that is responsive to local concerns, the schemes will plausibly impact on social acceptance and therefore the likelihood of grassroots resistance. Such resistance might strip the 'social licence to operate' from a development, potentially leading to legal challenges, or impacting on political decision-making about how the development should be regulated, governed and taxed—and even if it should continue at all. A community benefit scheme might work to head off and take the wind out of the sails of community resistance. Indeed, even if no changes to the operations are possible (it's a 'done deal'), weakening the motivation for community protests and public outcries, and encouraging apathy and ambivalence, might still benefit the operators, industry and political backers in the long term. The schemes could therefore provide 'hush money' or 'shut up candy', appeasing people to keep them quiet. As such, community benefit schemes can influence decision-making about the development's ultimate legal status and prospects*."[93]

Community Benefits Schemes will not make up for loss of wildlife and ecosystems, which are often that which are most badly affected by renewables developments, but they may serve to engineer acceptance from humans. They should be considered bribery as that is their intention and the benefits, if any are inequitably distributed.

SUMMARY OF CORRUPTION ISSUES

It is clear that there is massive potential for corruption at every stage of renewable energy generation, from the mining for critical minerals, to deployment. All these, if present, will reduce productivity. There appears to be almost zero oversight and

[93] Benefits or bribes? Ethical concerns with the potential corruption of civic obligations through community benefits schemes for wind farms

regulation to minimise the risk of all these potential aspects of corruption. Indeed, when state governments operate and deal with renewables projects via state-owned corporations, they become both operator and regulator, and there is scope for massive conflict of interests, if not collusion and corruption. Should that not be within the scope of the Productivity Commission report has it will have profound impacts on productivity?

Draft recommendation 1.3

Introduce an emissions-reduction incentive for heavy vehicles and phase out policy overlaps for light vehicles

The Australian Government should introduce a new emissions-reduction incentive to cover heavy vehicles. The incentive should be as technology-neutral as possible, meaning that it should create the same incentive to reduce emissions by switching from fossil fuels to electric vehicles, low-carbon liquid fuels or any other method to reduce emissions.

Now that the Australian Government has implemented the New Vehicle Efficiency Standard, it should phase out the exemption of electric vehicles from the Fringe Benefits Tax, and state and territory governments should phase out the exemption of electric vehicles from vehicle stamp duty and registration discounts.

RESPONSE

The underlying assumptions that emissions-reduction for heavy vehicles can be achieved by switching to electric vehicles and low carbon liquid fuels is completely flawed.

The reasons for this are:

- The claimed "low emissions" of electric vehicles are based largely on these drawing electricity from "low carbon" electricity networks – as I have demonstrated above, the assumption that wind and solar are low carbon relies on the omissions of declining efficacy and increasing emissions due to curtailment, omissions of the emissions of battery storage and the biosphere impacts from extensive new mining required, omissions of the increased emissions of balancing fossil fuels, and the omissions of devastating direct ecosystems impacts of wind generation in particular, plus omissions of similar impacts from new transmission required.
- Fleets of EVs also require extensive kerbside, home, and business battery storage to directly recharge the EVs. The stated emissions of EVs ignore the loss of electricity due to this requirement – roundtrip efficiencies are only 70-80%. The emissions of this extra battery storage, largely due to their mining, biosphere effects, and transport are also ignored (see above). Remember that the most significant causes of emissions of EVs themselves are the batteries – the increased levels of EVs mandated requires a vast network of EXTRA batteries which are ignored in the EVS vs ICE vehicle calculations.
- It is quite possible if not likely that the actual calculated emissions of EVs themselves are deliberately downplaying and ignoring environmental impacts of mining – science seems to be almost completely captured by industry. As stated

above, just for nickel, which is a usual component of batteries, the embodied emissions appear to have been underestimated by a factor of 4-500 due to ecosystem/biosphere impacts, as stated above. Indeed, some industry calculations have found that the overall emissions of EVs are worse than those of comparable ICE vehicles[94]. I have not seen comparable calculations for heavy vehicles. Because the batteries required are massive, both within trucks and for business/kerbside charging, I might speculate that the situation for them might be even worse. The fact that such calculations are not publicly disclosed certainly worries me.

- "Low carbon liquid fuels" are simply greenwashed fuel production using ethanol or synthetic processes[9596]. "*Low Carbon Liquid Fuels (LCLFs) are renewable energy sources used in sectors difficult to electrify, such as aviation and heavy transport, by recycling carbon from the atmosphere through feedstocks like biomass (sugarcane, waste fats) or captured CO2 and hydrogen. Produced from organic matter or synthetic processes, LCLFs include sustainable aviation fuel (SAF) and renewable diesel, offering a path to net zero emissions by replacing fossil fuels without requiring engine upgrades. Australia is actively developing its LCLF industry to provide sustainable aviation and diesel fuel, enhance fuel security, and create jobs*[97]*."* Basically, these fuels still involve the combustion of carbon to form CO2, and it seems the source of these may well be sugar cane. Because the "sugar cane (or other crop) grows back", these are seen simplistically as "sustainable", but that ignores the expanded area of agriculture needed to sustain this fuel source. The expansion of this source of fuel will necessitate massive direct and indirect deforestation, which is catastrophic for the climate[98991001011021031104]. Also ignored by this narrative are the expanded levels of fertiliser requirements, some of which will be supplied directly via fossil fuels, such as nitrogenous fertilisers[105106]. Other fertilisers are provided by unsustainable mining of other elements needed for fertilisers for sugar cane, such as phosphorus[107]. Regardless of source, LCLFs still involves combustion of

[94] Shock truth! Industry document shows electric vehicles worse for environment than petrol cars
[95] The Truth about Biofuels
[96] Biofuels 'worse than petrol' for climate
[97] Low-carbon liquid fuels of the Future Made In Australia
[98] Do Biofuels Destroy Forests? Link between Deforestation and Biofuel Use
[99] A global analysis of deforestation due to biofuel development
[100] Biofuels Development and Indirect Deforestation
[101] How The Biofuel Industry Hinges on Deforestation
[102] Biofuels and other grand failures of thinking locally
[103] Indonesia's biodiesel drive is leading to deforestation
[104] Biofuels policies to massively increase deforestation by 2030 – study
[105] Got nitrogen? On the links between nitrogen pollution and overpopulation
[106] What's the Problem with Fossil Fuel–Based Fertilizer?
[107] Depletion of Phosphorus Reserves, A big Threat to Agriculture: Challenges and Opportunities

carbon which is released into the atmosphere, and due to overshoot of loss of carbon sink capacity globally, this will likely remain in the atmosphere forever. The carbon uptake of regrowing sugar cane draws down a limited amount of carbon temporarily, from all sources globally, not just Australian sources, and all this carbon and more (due to necessary fossil fuel agricultural inputs), will again be emitted into the atmosphere. This source of "low carbon liquid fuels" also ignores the devastating effects of climate effects of deforestation and fertiliser use in water catchments, which has direct adverse impacts on the Great Barrier Reef. Replacement of fossil fuels by LCLFs is also UNSUSTAINABLE, as fossil fuels are, at the scale required. They add to biogeochemical flows, which is another catastrophic aspect of overshoot of planetary boundaries, as well as loss of biosphere integrity and climate change[108].

- Finally, as with all recommendations, the Productivity Commission has failed to recognise that we are already in overshoot and continued growth of economy and population will obviously and undoubtedly make climate change and overshoot of planetary boundaries worse. There is nothing in their recommendations that suggests they acknowledge that or have any understanding of this. I can only surmise that, like the ALP government, they are climate change and planetary overshoot denialists. They compensate this by utilising sycophantic greenwashing and not calling into question government policies and motives. The Productivity Commission claims to conduct research of the highest calibre, but it seems they do not and have not obeyed their charter, and betrayed the Australian people.

Draft recommendation 1.4

Apply frameworks to achieve emissions targets at least cost and improve transparency

The Australian, state and territory governments should improve the transparency of emissions-reduction policies by consistently including estimates of their cost-effectiveness in impact analyses. Those estimates should routinely be assessed against agreed national carbon values.

The Australian Government should:

• task an independent agency with relevant expertise with developing national carbon values. These values – estimates of the implied carbon prices needed to meet Australia's emissions targets – should be used consistently as policy benchmarks

[108] Earth beyond six of nine planetary boundaries

across government and in regular reporting on the cost-effectiveness of emissions-reduction policies

• design and evolve policy settings to be broadly aligned with these carbon values.

To support achieving net zero in 2050 at as low a cost as possible, the Australian Government should:

• develop a framework for extending emissions-reduction incentives to new sectors. The costs associated with any new policies to reduce emissions in areas like agriculture and household gas should align with the target-consistent carbon values

• continue work to ensure ACCUs are high integrity and seek to integrate ACCUs into every national emissions-reduction policy in the long term so hard-to-abate emitters face consistent incentives.

RESPONSE

ACCUs have been shown to be largely flawed by independent research, chiefly led by Professor Andrew Macintosh.

"*In March last year, our research team raised serious concerns about the scheme. In a series of papers, we outlined systemic flaws in the way carbon credits were issued.*

We concluded Australia's Emissions Reduction Fund – under which the scheme operates – has serious governance flaws, has issued a large number of low integrity credits and is wasting billions of dollars in taxpayers' money.

Our analysis focused on three of the fund's most popular methods – avoiding deforestation, human-induced regeneration of native forests and combusting methane from landfills. These account for 75% of the credits issued under the scheme.

We found that more than 70% of the credits issued under these methods do not represent genuine emissions abatement."[109]

In other words, at least, 93% of the credits issued do not represent genuine emissions abatement.

In response, the government commissioned their own "independent" inquiry, despite the fact that the criticism already came from non-government independent researchers. This seems to have been a deliberate attempt to cover up and greenwash the shortcomings of the ACCU scheme. If ACCUs are issued for actions and schemes which do not represent genuine emissions abatement, then isn't that corruption? If that is corruption, where are the prosecutions? Or is this just a "mistake"? Given the

[109] Chubb review of Australia's carbon credit scheme falls short – and problems will continue to fester

government's response in simply commissioning their own review, it doesn't seem to have been a mistake.

"*Climate Change and Energy Minister Chris Bowen on Monday said the government accepted all 16 of the review panel's recommendations*."

Professor Mackintosh: "*He criticised the lack of evidence included in the report, and said he did not believe the report's findings were based on research commissioned by the panel.*"[110]

If the report's findings were not based on research commissioned by the panel, isn't that "scientific fraud" – fabricating results/findings to give the desired outcome?

So, the Productivity Commission has not criticised the scheme and assumes it is working fully to abate emissions. They have not examined the integrity of the scheme and whether carbon emissions are actually abated. The only real change appears to have been the "emissions abatement of avoided deforestation" is excluded from ACCUs. Is it assumed that human-induced reafforestation and combusting methane in landfills are working as planned? Has there been any oversight of this from truly independent scientists to prove that it's working?

And whilst combusting methane in landfills might reduce methane emissions in exchange for more CO2 emissions, it is not actually "abating emissions" but reducing them in the short term. The only real way to abate emissions is massive reafforestation, which is impossible given government policies of implementing massive new renewable energy facilities, covering an area 1.7 times that of Tasmania, new areas of deforestation for biofuels, new critical minerals mining, and population growth requiring destruction of both agricultural land and ecosystems for new housing and infrastructure. Like the ALP Government, does the Productivity Commission inhabit a fantasy world where land area is infinite and "we can do it all"?

And why is it, if indeed ACCUs do work, industries which cause deforestation and release of carbon by deforestation, and loss of carbon sequestration, are not paying ACCUs? For example, agriculture, mining, land developers for new housing and infrastructure, new high voltage transmission networks and wind farms in remnant forests and those that cause clearing of any carbon-sequestering vegetation? Why are they excluded? The scheme appears to be absolutely flawed from that perspective too. Just because they supposedly provide "clean electricity", why are wind and solar farms and battery storage and HV transmission operators excluded from accounting for their biosphere impacts?

[110] Carbon credit scheme review rejects criticisms it is flawed, recommends changes to improve transparency

2. Speeding up approvals for new energy infrastructure

Summary

Environmental and other regulatory approvals for infrastructure projects are vital, but they are slowing down the energy transition.

Reforms should seek to both improve regulatory standards and speed up approvals. Much can be done without compromising the environment.

• At the Commonwealth level, reforms to the Environment Protection and Biodiversity Conservation Act 1999 are pressing and overdue.

• There should be national environmental standards, better regional environmental planning, efficient and robust offsetting arrangements, and clear rules about engaging with local communities and Aboriginal and Torres Strait Islander people.

Resources should be focused on assessing projects that are most important to the energy transition.

The Australian Government has a list of priority projects, but they need to be assessed faster.

• A strike team should be formed to assess priority clean energy projects. The team should be adequately resourced and have a strong clean energy capability.

• An independent person with strategic oversight of approvals should be appointed – an Australian Government Coordinator-General – to work across government, break through roadblocks and keep approvals on track.

Environmental assessments are largely project agnostic – a carpark and solar farm are treated in much the same way. The law should be changed to allow decision-makers to take into account the fact that a project is important to Australia's clean energy transition.

Faster approvals can reduce emissions, reduce costs for developers, attract investment and make energy cheaper – all of which support productivity growth

RESPONSE

These recommendations are quite clearly deeply flawed and **ABHORRENT**.

They are based on the classification of wind and solar as being "clean energy", without any scrutiny whatsoever. As I demonstrated extensively in the response to the first recommendation, above, this is quite clearly not the case.

In the big picture, there is no energy transition, because attempting to transition requires increased not decreased levels of fossil fuel consumption and quite clearly increased biosphere impacts from mining and deployment[111].

"*The 'fake green fairytale' claims humanity can maintain current levels of consumption (a lie) by being powered by renewables (a lie) which are already displacing fossil fuels (a lie) and therefore reach net zero (a lie) to bring temperatures down to safe levels within just a few years (a lie) to secure a sustainable future for all (a lie) and that the enemies of this outcome are the critics of the energy transition (a lie) who are all funded or influenced by the fossil fuel industry (a lie) so the proponents of green globalist aims are ethical in doing whatever it takes to achieve their aims (a lie).*"

"First, the claim that humanity can maintain current levels of consumption is not true. Already, humanity is overshooting the carrying capacity of Planet Earth. This year the day that marked the beginning of the overshoot was August 1. We are degrading the capacity of seas, forests and soil to produce what we need, as well as using up key minerals. That's even with around 800 million people malnourished last year (about 1 in 10 of us worldwide). Meanwhile, our monetary system requires our economy to expand consumption of resources, and the theory of decoupling that consumption from resource use has been debunked by hundreds of peer reviewed studies.

Second, the claim that modern societies can be powered by renewables while maintaining our current levels of energy use is not true. Over 80% of current primary energy generation is from fossil fuels. Even if we tried to switch everything to electric and generate the power from nuclear, hydro, wind, solar, geothermal, tidal and wave, then we wouldn't have enough metals for either the wire or the batteries. For instance, we would need 250 years of annual production of copper for the wire and 4000 times the annual production of lithium. Mining is an ecologically damaging activity. And we would need to trash huge tracts of forest to produce the needed quantities of metal. There will be resistance, and rightly so.

Third, the claim that renewables are already displacing fossil fuels is not true. Instead, globally, renewables are providing additional energy, with fossil fuel usage also increasing. There is no sign of global energy demand declining or any policies aimed at that. We all know that having a side salad with our pie and chips doesn't make the belly disappear. Therefore, renewables are not yet an answer to the problem of carbon emissions from fossil fuels forcing further climate change. Only policies targeting a reduction of use of fossil fuels, globally, would begin to tackle that – and we see it hardly anywhere.

[111] The Nine Lies of the Fake Green Fairytale

Fourth, the claim that the world can reach net zero carbon emissions is a lie. Not only is that due to the previous two lies about energy production and demand. Not only is that due to the limitations of any carbon removal technologies and approaches, for getting CO2 out of the atmosphere. It is also because of the fundamental role of fossilised or natural gas in current industrial agriculture. We are a grain-based civilization with estimates of between 50 to 80% of our calories coming from 5 key grains, either directly or via the animals that some of us eat. About 60% of these are produced with chemical fertiliser, which is currently dependent on fossil fuels. A tonne of such fertiliser releases twice its weight as CO2. That is before considering the machines and transportation involve. With Bekandze Farm, my own work and philanthropy is promoting farming without chemicals, but I recognize we are utterly dependent on them for our current food supply.

Fifth, the claim that achieving net zero emissions would bring temperatures down to safe levels within just a few years is not true. The claim derives from over-claiming, or misrepresenting, what the simulations run on some climate models have found. Those models ignored methane. In addition, recent data on removing aerosols suggests it is a larger driver of heating than was previously understood. Even with those limitations, the research was inconclusive, with some models showing ongoing warming, some showing none, in the impossible scenario of the world having stopped all CO2 emissions. That scenario, by the way, would be even more severe curtailment than net zero (which still allows for some emissions).

Sixth, the claim that such changes will secure a sustainable future for all is not true. That is because both ecological overshoot and climate change have already progressed too far, while ongoing destruction and pollution are too much of a feature of industrial consumer societies. The idea that billions more people can improve their lives by being incorporated into such industrial consumer ways of life is nonsense. Rather, the way we privileged people live is a time-bound and geographically-bound niche: if we care about people in poverty then we need to look at different ways of helping, as well as consuming and polluting less ourselves.

Seventh, the claim that any critics of the renewable energy transition are enemies of a sustainable future is not true. The enemies of humanity living happily-ever-after in industrial consumer societies are basic physics, chemistry and biology. Evangelising about it and condemning non-believers does not make that future any more feasible. Instead, we could be working for a more gentle and just collapse, and a lesser dystopia, with less suffering and more joy than otherwise would be the case. The enemies of that are people who distract us from how to fairly reduce and redistribute resource use.

Eighth, the claim that critics are all funded or influenced by the fossil fuel industry is not true. Rather, many of us are the more radical and anti-corporate voices in

environmentalism. We are aligned with the history of environmental critique, which recognizes climate change as one symptom of a destructive economic system and its associated politics and culture. We want to reduce emissions but refuse to align with a new faction of capital that wants to profit from this disaster by selling inadequate solutions and false hope.

Ninth, the claim that proponents of pseudo-green capitalist policies are ethical in doing 'whatever it takes' to achieve their aims is not true. For it is not ethical to override support for the rights of indigenous peoples living in the lands where large corporations want to mine, so that more people can drive a Tesla. It is not ethical to infiltrate climate activist groups to steer them away from radical politics. It is not right to get big tech platforms like Facebook to restrict the reach of analysis which challenges their 'fake green fairytale'.

Art Berman states:

"*For more than two decades, governments, international agencies, and corporations have promoted the false hope of an "energy transition." History shows otherwise. There are no examples of true transitions—only new energy sources added on top of old ones.*

The theory was that if we replace fossil fuels with renewables, emissions will fall and the climate-change problem is solved. But the reality is that no credible outlook shows fossil fuel use falling enough to reduce emissions in a meaningful way.

Jean-Baptiste Fressoz is right that the very idea of an energy transition is not just wrong, it's dangerous. It gives the false expectation that replacement of fossil fuels by renewables is possible, and that growth and living standards can carry on unchanged. But old fuels never disappear. Renewables are built on fossil foundations. Mining, cement, steel, and global supply chains all run on hydrocarbons. Even efficiency gains depend on cheap fossil energy.

What we're left with is more consumption, more debt, more ecological overshoot, and a political economy built on cheap energy that no longer exists. Prosperity is now out of reach for many households, businesses, and even nations. That collapse in affordability is the real fuel behind today's populist revolt against the old order and its elites.

The energy transition bet everything on renewables replacing fossil fuels and on the promise that growth could continue without much disruption to ordinary life. If ever there were a too-good-to-be-true story, that was it. We should have seen the fallacy long ago—but we didn't want to.

There was never a Plan B. I don't have one either, but it's past time to face the predicament head-on. Doubling down on a failed model isn't the answer, and pretending otherwise is just stupid. "[112]

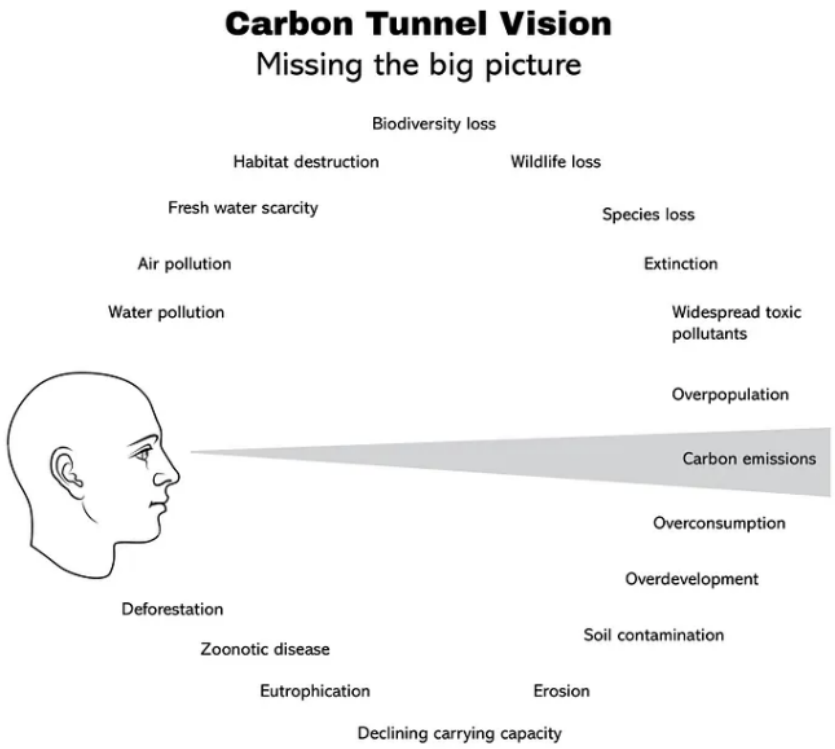
The recommendation displays a dangerous and flawed interpretation of climate change. It seems to consider that just supposedly reducing emissions going forward will correct climate change. There are so many levels to this fallacy of that standpoint. Just from the point of view of the attempted transition, I demonstrated above that just for the supply chain for rare earths, Net Zero will require globally 11-26 b tons CO2 emissions, perhaps more, and still that will not totally replace fossil fuels, especially in the context of more economic and population growth. And it cannot. Around 50% or more of climate change is due to both deforestation and the industries which replace forests, mainly agriculture. Attempted Net Zero will dramatically increase biosphere destruction and degradation and it can truly offer no solution to both climate change and overshoot of planetary boundaries.

The True Nature Of Climate Change And "Climate Actions"

"Renewable energy" is just one of many proposed "climate actions". There have been many proposed and considered "climate actions", some of which have been endorsed by the IPCC and many governments. There is no doubt that climate change is here and is caused by elevated atmospheric concentrations of many greenhouse gasses.

However, fundamentally, climate change is ***also*** caused by the destruction of natural ecosystems, especially forests, which leads to the loss of carbon and methane sequestration, loss of evapotranspiration cycling, loss of shading, and loss of energy storage, and loss of rainfall – rainfall which would have otherwise given increased beneficial impact on all other effects, including shading, loss of carbon sequestration etc. It has been considered that deforestation has caused 1/3 of all emissions since 1850[113]. This is very significant and does not include the loss of all other climate-regulation effects of forests. Deforestation[114] and agriculture[115][116] combined contribute to at least 50% of anthropogenic climate change.

[112] The Energy Transition That Never Was
[113] Forests and Climate Change
[114] Degradation and forgone removals increase the carbon impact of intact forest loss by 626%
[115] Why Agriculture's Greenhouse Gas Emissions Are Almost Always Underestimated
[116] Meat And Agriculture Are Worse For The Climate Than Power Generation, Steven Chu Says



The climate consequences of ongoing deforestation are rarely if ever considered by governments, and this a devastating shortcoming. Never also considered is cumulative ***past*** deforestation, which has contributed massive levels of greenhouse gasses, and with it, loss of carbon sequestration, meaning there are CO2 and other greenhouse gasses which have no chance of ever being sequestered, as the ability of ecosystems to do that has now been massively degraded and diminished. This is one major aspect of climate change and overshoot of planetary boundaries that is never considered – it is only emissions going forward which are considered by government policy – not past emissions and destruction of ecosystems and degradation of the biosphere. All these past aspects of overshoot need to be corrected if we are to address climate change. This is essentially climate change denialist[117].

[117] The human eco-predicament: Overshoot and the population conundrum

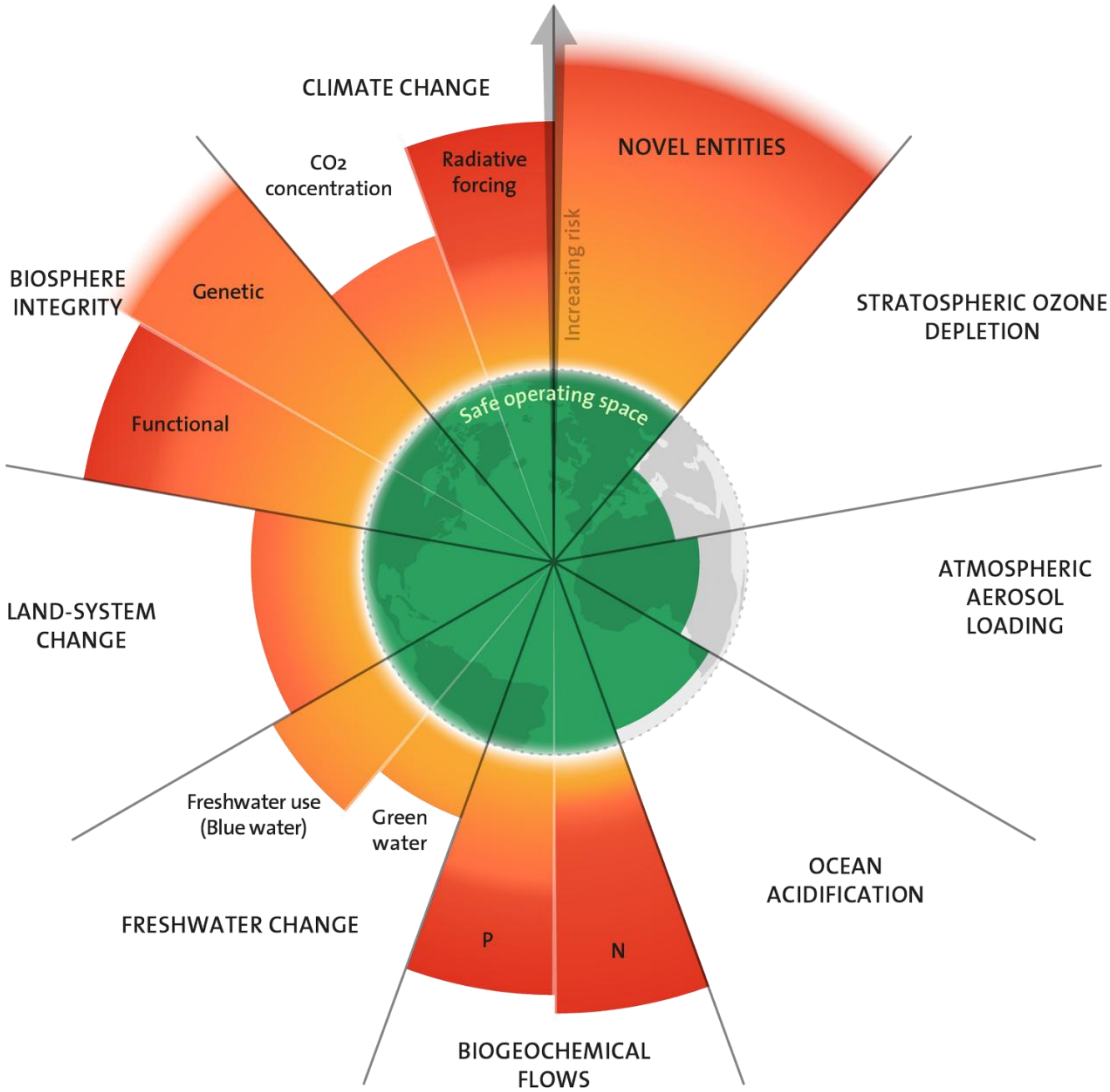
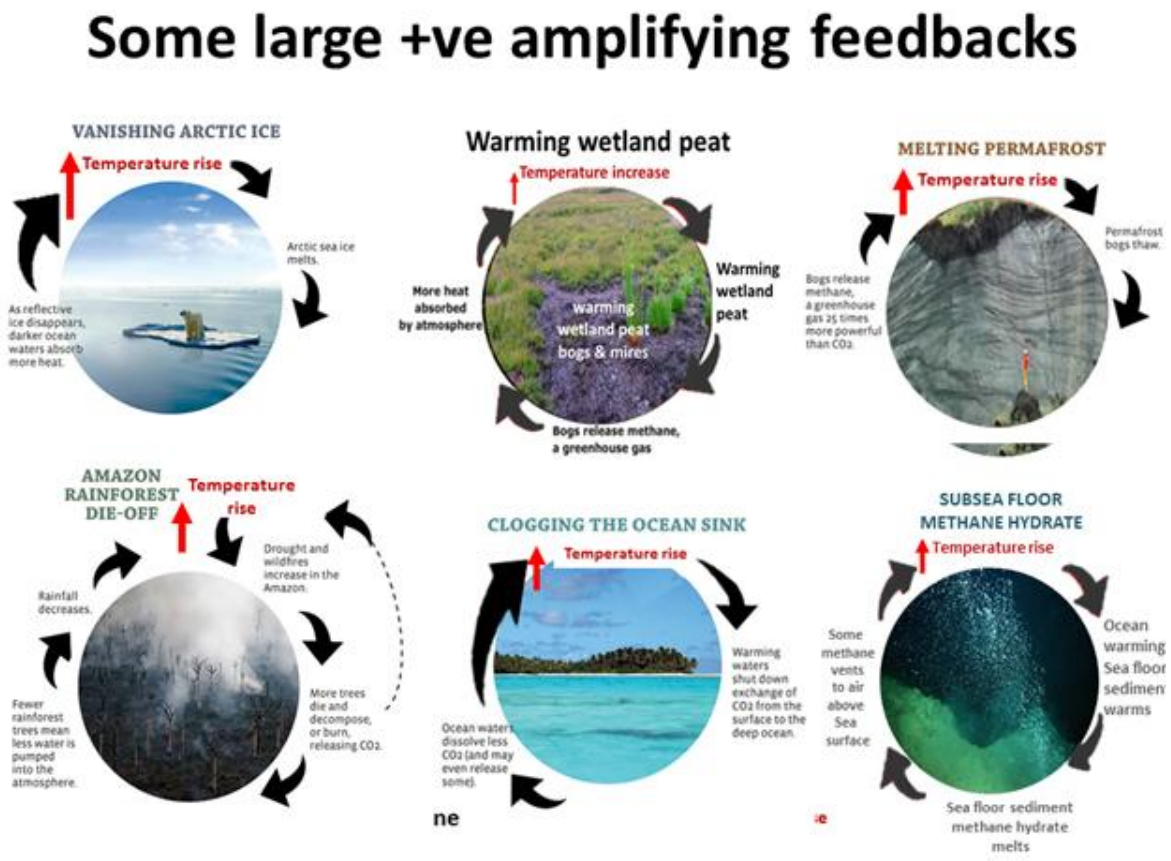


Figure 10 Overshoot of Planetary Boundaries; Renewable Energies address none of these, in fact they make various aspects of overshoot worse

In addition, mainstream narratives ignore the climate impact of greenhouse gasses which are already at elevated levels, committed warming, oceanic warming and positive feedbacks which are gaining strength rapidly, whilst regulatory negative feedbacks, generally based on ecosystems and biosphere climate regulation, are rapidly losing strength.



"The global focus on climate change, cemented by almost 30 years of UNFCCC conferences, has blinded the world to our true predicament — that is, ecological overshoot — of which climate change is just one of many symptoms. Organizations, governments, corporations, the media are all talking and talking about climate change and the supposed "solutions" of renewables and energy efficiency, while essentially ignoring the ongoing destruction of the natural world. I sometimes imagine them sitting around the large conference tables at the COP with their fingers in their ears singing la-la-la-la-la so as to tune out the natural world as she begs for mercy while they plan "green growth" and scheme to make sure none of the agreements will put a dent in any of their bank accounts.

Likewise, local governments, including the one where I live, are also entirely focused on climate change. Recent meetings, reports, policies, and plans in the county where I live reflect the ***carbon tunnel vision*** *that is legislated from on high, including state laws mandating net zero greenhouse gas emissions by 2050 and "clean electricity" by 2045, and enforcing a market-based program to cap greenhouse gas emissions."*[118]

[118] Why are we not talking about Ecological Overshoot?

Even going forward, the only conceivable way to stabilise the rapid upwards trajectory of every greenhouse gas is to reduce all emissions of every one of those, but also to increase the natural carbon and methane sequestration capacity of the biosphere. This is never considered. Indeed, the IPCC in their reports propose that deforestation be merely reduced, not eliminated. That seems to be the Australian government's stance as well. The IPCC and Australian Government are indeed climate change denialist. Just supposedly reducing emissions is not enough.

And the only way emissions are supposedly reduced is to be by increased adoption of "green energy" generation in the electricity grid, chiefly to replace coal generation. On the face of it, that seems a viable solution, but it ignores a myriad other climate-destructive effects of "renewable energy", which I will outline below and therefore such a narrative is overly simplistic and fallacious…And the proposed methods of "reducing emissions" will be release of more emissions, not less, in the next few decades, for reasons which I shall outline below.

Governments almost totally rest their climate credentials on "renewable energy" adoption, whilst simultaneously campaign for more economic growth, which is currently achieved mainly by rapidly increasing population via mass immigration. Economic growth even without population growth would likely still increase emissions, as it is difficult to achieve higher GDP could be ever achieved if renewable energy predominates as grid electricity energy source, and it would most likely entail increased amounts of fossil fuels being burned.

Germany has attempted a "renewable energy" transition with wind and solar and failed. Their emissions are still relatively high, and their industries are closing down due to higher energy prices which are mainly the result of renewable energy. And, like other European countries such as Spain, Denmark, Netherlands, and the UK, they have resorted to burning more carbon via biomass (forests) and bioenergy, carbon which in reality will never be sequestered owing to overshoot of deforestation globally. The only way to grow economies is really by burning more carbon, with more climate impacts.

However, when population growth is increased, it inevitably comes with it a host of other effects which all increase emissions and loss of carbon sequestration.

- The average migrant from a developing country increases their per capita emissions by around three fold upon migrating[119] – economic migrants migrate generally to increase affluence and consumption, not to decrease it

[119] On the effect of international human migration on nations' abilities to attain CO2 emission-reduction targets

- The needs of migrants for more housing, infrastructure and employment will all both increase emissions and cause increasing loss of ecosystems[120] and even stands of trees, all increasing Australia's climate burden.

So, even if industrial-scale wind and solar are effective at reducing grid electricity generation emissions, any positive impact would be negated, and more, by population and economic growth.

And it's even worse than that. Only about 20% of our energy needs come from grid electricity[121]. It is increasingly difficult to transition our transport and agricultural energy requirements to "renewable energy", as an even greater overbuild would be required with devastating actual and consequent land use change effects (eg deforestation) would be necessitated, all with diminishing unit efficacy due to issues which plague intermittent renewables generation, capacity credit due to grid and demand curtailment, as well as need for storage. Once the climate impacts of these are properly considered, it becomes apparent that renewable energy is really no better than fossil fuel generation, and likely worse, due to much increased direct and indirect biosphere impacts.

Climate actions which have been proposed as individual climate actions by the UN include[122]:

1. Save energy at home
2. Change your home's source of energy
3. Walk, bike or take public transport
4. Switch to an electric vehicle
5. Consider your travel
6. Reduce, reuse, repair and recycle
7. Eat more vegetables
8. Throw away less food
9. Plant native species
10. Make your money count
11. Speak up

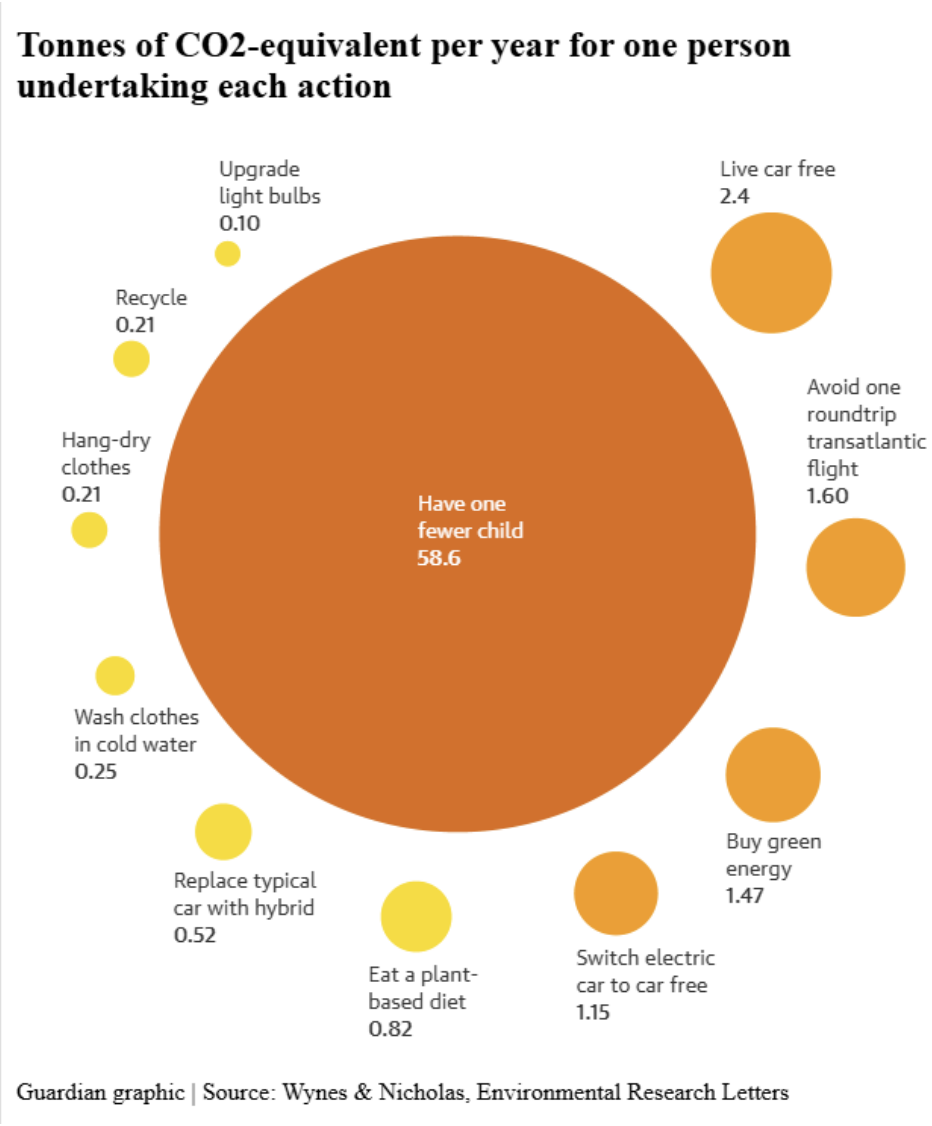
None of these individual actions will in reality have much appreciable impact on climate change, and in some ways, due to biosphere and climate impacts of massively expanded (16x) critical minerals[123] and rare earth mining[124], actions (2) and (4) will have worsening impacts on climate, because they worsen overshoot of loss of carbon

[120] Environmental implications of migration: Worldwide insights
[121] Electricity
[122] Actions for a healthy planet
[123] Increase in demand for critical materials under IEA Net-Zero emission by 2050 scenario
[124] Global environmental cost of using rare earth elements in green energy technologies

sequestration and add to greenhouse gas emissions. Nowhere is there advice to reduce and stabilise and reverse economic and population size. Population[125] and economic growth[126] both contribute to increasing greenhouse gas emissions as well as increasing loss of carbon sequestration[127][128]. "Eating more vegetables" I would presume means eating less meat, which may be beneficial, but eating more vegetables may require increased unsustainable water demands for crops[129][130], more ecologically devastating monocultures[131], and more unsustainable loss of topsoils[132], compared to say, beef production in northern Australia, which on many properties involves retention of native vegetation.

The one climate action which would have the most significant impact[133] has been excluded from discussion. That is, having fewer or no children, is generally the most impactful climate action in any country, including developing countries, saving around 58.6 tons CO2 emissions per year per person in developed countries. We need to ask why it has been excluded from discussion when clearly having fewer children and a small population addresses both emissions of greenhouse gasses and loss of ecosystems, like no other climate action? Indeed, this study[134] has shown that parents individually account for 25% greater emissions than comparable non-parents.

[125] The Connections Between Population and Climate Change
[126] CO2 emissions, energy consumption, and economic growth: Determining the stability of the 3E relationship
[127] COP26: Agricultural expansion drives almost 90 percent of global deforestation
[128] Deforestation rises with incomes in developing economies
[129] Unsustainable groundwater use for global food production and related international trade
[130] Water scarcity in agriculture: An overview of causes, impacts and approaches for reducing the risks
[131] On the relation between monocultures and ecosystem services in the Global South: A review
[132] Soil and the intensification of agriculture for global food security
[133] The climate mitigation gap: education and government recommendations miss the most effective individual actions
[134] Economists find carbon footprint grows with parenthood



We need to ask why this climate action has been totally ignored by governments, the education system, the UN and IPCC. The authors of the article state, "Our results show that education and government documents do not focus on high-impact actions for reducing emissions, creating a mitigation gap between official recommendations and individuals willing to align their behaviour with climate targets." Why does no political party mention that having fewer children is the most effective action that one can undertake in any country? Even political parties that regard themselves as not climate change denialist, and embracing climate science, such as the Greens, do not mention this critical climate action, and instead embrace population growth, both as demonstrated by their own child-bearing behaviour, and by their advocacy for mass immigration[135] and open borders[136], as well as for building 1 million homes[137], mainly for

[135] Greens: Immigration has minimal impact on housing market
[136] Greens want open borders and a degraded university system
[137] Greens announce plan to build one million homes

immigrants, which inevitably will result in huge emissions[138] as well as further loss of carbon sequestration[139] which we simply cannot afford.

The latest update to this is that Indians will help build one million homes[140] – where, and what are the emissions costs and loss of carbon uptake necessitated by this? Suddenly we find again that climate change seems again to have been completely forgotten when it is not aligned with government narratives and policy, and ideological narratives, such as open borders Marxism. It only becomes an issue when the government declares that we need "renewable energy". We need to look at the climate impacts of renewable energies and why it is that the Greens party and ALP embrace them so vehemently to the exclusion of almost every other action which may be beneficial in tackling climate change and overshoot of planetary boundaries[141].

Going back to the recommendation that:

"Reforms should seek to both improve regulatory standards and speed up approvals. Much can be done without compromising the environment."

This is oxymoronic and does not appreciate reality – it is just not possible to speed up approvals and better protect the environment. The Productivity Commission does not understand just how bad the EPBC Act already is – it is already simply a tool that allows any environmentally-destructive development to go ahead, and have its effects greenwashed via the "avoid-mitigation-offset" hierarchy.

And many environmentally destructive developments already avoid EPBC scrutiny[142] and many species have suffered significant habitat loss already by the cumulative impacts of developments where the proponents and DCCEEW have decided that the habitat loss is "insignificant"[143].

The Minister and delegate has overall power to approve any project and simply can ignore and greenwash its impacts. This is especially bad in the case of wind farms, where significant impacts such as habitat denial and alienation, and aerial impacts, are totally ignored, and significant impacts such as bird and bat mortality are downplayed and greenwashed by collusion with developers and no provision of any functional oversight whatsoever.

Giving renewable energy fast-tracked approvals will obviously greatly harm biodiversity and climate, this is a terrible recommendation. Going forward, the greatest cause of destruction to koala habitat is renewable energy, especially wind energy in Queensland.

[138] How much CO2 is emitted by building a new house?
[139] Australian vegetated coastal ecosystems as global hotspots for climate change mitigation
[140] India in "deep negotiations" to help build 1 million homes in Australia amid housing crisis
[141] Earth beyond six of nine planetary boundaries
[142] Lots of loss with little scrutiny: The attrition of habitat critical for threatened species in Australia
[143] Environment law fails to protect threatened species

And the situation is much worse for koalas and other species inhabiting remnant forests on coastal and Great Dividing Ranges than this ABC article[144] alluded to – many more renewables' projects have since entered the EPBC pipeline which will have individually and cumulatively devastating environmental and climate impacts, at least four times the amount of koala habitat clearing and fragmentation stated. How can fast-tracking approvals for wind projects particularly in Qld and NSW help the koala? It won't.

If the response is "they're under threat from climate change anyway", that is a lie that ignores that the most significant cause of declining populations and increasing extinction risk of most species is in fact habitat loss, not climate change[145]. And the worst cause of climate change is not fossil fuels but destruction of ecosystems and habitat, because that causes BOTH emissions and loss of carbon sequestration[146], as well as loss of many other aspects of ecosystems' climate regulation including shading and loss of evapo-transpiration[147].

The very worst thing we can do is fast track approvals for any development which destroys habitat and biodiversity. And that includes "renewable energy'.

And even where wind farms are situated on mainly cleared land, they continue to have devastating biodiversity impacts, and the Productivity Commission fails to realise and understand this. For example:

- They will kill in excess of 40 million insects per turbine per year – insects are vital components of all terrestrial ecosystems[148]
- They will kill individuals of many bat species – carcass surveys are not independent, typically run for only the first 2 years, and deliberately underestimate the mortality of bat species, causing population declines and local extinctions[149]
- They will kill many bird species in many areas, including raptors and migratory species, such as the white-throated needletail, sending them to extinction – biggest threat to needletails in Australia is now wind turbines[150]
- They have their own climate effects – mining causes loss of biosphere and biodiversity, and they cause surface warming (see above)

[144] How much koala habitat is cleared for mining and renewable energy projects each year?
[145] An inconvenient misconception: Climate change is not the principal driver of biodiversity loss
[146] Degradation and forgone removals increase the carbon impact of intact forest loss by 626%
[147] The world's forests do more than just store carbon, new research finds
[148] Insect fatalities at wind turbines as biodiversity sinks
[149] Wind turbines without curtailment produce large numbers of bat fatalities throughout their lifetime: A call against ignorance and neglect
[150] The Action Plan for Australian Birds 2020

- Same applies for solar farms – deplete insect[151] and bat numbers[152], loss of habitat, loss of carbon sequestration, and increased surface warming due to loss of albedo[153] and direct surface warming[154].
- The deployment of hugely area-dependent and location specific renewables and energy infrastructure projects is also detrimental to climate action because it prohibits reafforestation in those areas and is yet another industry increasingly vying for utilisation of limited land area. The most suitable areas for reafforestation are higher elevation areas on ranges which wind farms are actually deforesting, and more highly fertile areas in flat valleys which solar farms are occupying and contributing to prevention of reafforestation.

"There should be national environmental standards, better regional environmental planning, efficient and robust offsetting arrangements, and clear rules about engaging with local communities and Aboriginal and Torres Strait Islander people."

Draft recommendation 2.1

Reform national environment laws

The Australian Government should reform environment laws to expedite approvals for clean energy projects and better protect the environment. The reforms should:

• introduce national environmental standards

• facilitate regional planning, particularly within renewable energy zones, with stricter statutory deadlines for assessing projects in 'go zones'

• provide accessible, high-quality information about the environment and past assessment decisions

• make offsetting arrangements more efficient, such as by enabling developers to meet their offset obligations by contributing to an Australian Government offsets fund

• set clear expectations about engagement with local communities and Aboriginal and Torres Strait" Islander people.

[151] Solar panel attraction deadly for insects
[152] Insectivorous bats alter their flight and feeding behaviour at ground-mounted solar farms
[153] A global assessment of the effects of solar farms on albedo, vegetation, and land surface temperature using remote sensing
[154] Solar panels can heat the local urban environment, systematic review reveals

RESPONSE

Of course, there should be "*better environmental standards*" but the productivity Commission has tellingly refrained from suggesting what they might be. They of course do not want to provide any roadblocks or "green tape" which might slow down "productivity" and "growth". The Productivity Commission is utterly conflicted and cannot provide an unbiased and objective assessment of these.

Facilitating regional planning as well as expediting approvals for "clean energy" projects necessarily will destroy more carbon sequestration, increase fossil fuel consumption, and cause more local extinctions.

It's abhorrent that a government organisation who's basic reason for being is to facilitate endless economic and population growth has been tasked to provide policy for government regarding environmental protections. Fundamentally the Productivity Commission does not want the environment protected, and, like the government it answers to, greenwashes its destruction, even more absurdly, on the false premise of "climate action". Its yet another case of the fox being in charge of the henhouse.

Stricter statutory guidelines for assessing (& approving) projects in "go zones' in no way protects the environment but instead more rapidly destroys ecosystems and farmland, and is aimed at ignoring and suppressing any opposition to this. Already very few projects of any description are rejected under EPBC laws, this will dwindle to virtually zero under the "reforms' proposed by the Productivity Commission.

"*Provide accessible, high-quality information about the environment and past assessment decisions*" is simply strict control of the sources of information about the environment and the impacts of developments on it. The Productivity Commission is advocating for a centralised source of environmental information which can be controlled and vetted by the federal government. This is no way improves environmental transparency and accountability but instead closes it down. Already almost no scientists are objectively able to criticise the environmental impacts of renewables and other industries for fear of having their funding withdrawn. The government wishes not only to close down free speech but objective scientific discourse. For example, scientists who report the devastating biosphere impacts of mining for renewable energy and EVs are not able to criticise the industries or the fallacy of "the transition' but instead advocate for "better planning" for fear of losing funding. This seems obvious to an outsider.

Similarly, information about past assessment decisions is to emanate from one centralised government-controlled source. What can go wrong? Already the DCCEEW website is full of greenwashing and misinformation on environmental and climate impacts of renewable energy.

Interestingly, the Productivity Commission has not advocated for independent scientific scrutiny of the environment or impacts of proposed developments, or independent review of assessment decisions. Nor have they proposed that citizen scientists be allowed to review areas of biodiversity before they are destroyed[155]. They want the rampant ecocide sped up for "productivity". The Productivity Commission has no environmental concerns and pretends processes which are mutually exclusive, "better environmental protections" and "faster approvals", can co-exist. They have not acknowledged that environmentally consultancy firms are hopelessly compromised; on the one hand the EPBC Act demands that they provide "proper environmental assessments" without providing guidelines on exactly what that might mean, on the other hand, the consultancies are selected by proponents on the basis of proven ability to "get the project over the line" and approved under the EPBC Act. The consultancies are heavily incentivised to provide misinformation and disinformation to the DCCEEW regarding the nature of ecosystems and biodiversity within project areas, and the environmental impacts of the proposed development.

"*make offsetting arrangements more efficient, such as by enabling developers to meet their offset obligations by contributing to an Australian Government offsets fund*"

This proposal is probably the most outrageous and abhorrent proposal in the whole document!!!

Not only does the Productivity Commission not only fail to criticise the offset process, which allows environmentally destructive projects to be approved, heavily greenwashed by the "net conservation gain" lies by the DCCEEW, they are actually proposing that no "like for like" offsets be even provided, and instead, destruction of habitat and ecosystems can be remedied by cash payments to the government. On the false premise that the government will somehow magically provide habitat on land area which does not and cannot exist due to the government's policies of endless population and economic growth, agricultural expansion, renewables expansion of 1.7 x the area of Tasmania, expansion of 10 000- 20 000 km of extra transmission lines, expansion of agriculture due to biofuels, and expansion of critical minerals and fossil fuel mining.

This policy will ensure the even more rapid decline and extinctions of koalas[156] and a multitude of other species, and worsening climate change due to increasing loss of ecosystems and biosphere integrity.

[155] Citizen scientists can help save Australia's threatened species if we give them more direction
[156] Biodiversity offset conditions contributing to net loss of koala Phascolarctos cinereus habitat

I am completely shocked by this proposal, and even more shocked that the Productivity Commission can propose this and in the same document claim that they advocate for better environmental standards and better environmental protections.

As it stands already, biodiversity offsets are not providing any conservation gain, because habitat destroyed simply cannot be replaced by some vague environmental management in offset areas as the government claims. The fact is, already offset areas are being depleted by this sham process[157].

But simply enabling the offsetting to be done via cash payments[158] is taking it to another level, ensuring the extinction of thousands of species and decimation of remaining ecosystems in Australia, and undoubtedly worsening climate change. This is a truly disastrous proposal.

The other issue with offsets is of course commonly overlooked. It is a massive wildlife welfare issue. Wildlife which has their habitat destroyed by development most commonly die, often by lingering slow death due to loss of food supply and shelter[159], and also by predation and roadkill. The whole premise of offsets is that their deaths can be compensated by the protection of habitat elsewhere, or planting trees elsewhere. This does not help the thousands of species of animals and plants which will be directly killed or die due to the development. It's completely cruel and environmentally fraudulent. And those who advocate for this as compensation for lost habitat are people who are ok with the slow cruel deaths of voiceless, innocent wildlife; people who entirely lack empathy for wildlife, and probably other humans.

"*Engaging with Aboriginal and Torres Strait Islander people is vital. A significant proportion of land suitable for renewable energy projects is located on land over which Aboriginal and Torres Strait Islander people have legal rights and interests (Quail et al. 2025, p. 1). Potential impacts on cultural heritage sites, for example, should be a key consideration for developers*."

This recommendation seems to be essentially advocating for cash payments and/or employment for ATSI people, to enable ecocide for renewable energy projects on their land to rapidly proceed. This again ignores the fact that their land contains important carbon sequestration and climate-regulating ecosystems, as well as harbours significant biodiversity.

[157] INQUIRY INTO INTEGRITY OF THE NSW BIODIVERSITY OFFSETS SCHEME
[158] Performance of habitat offsets for species conservation in dynamic human-modified landscapes
[159] How habitat fragmentation affects animals

"*Resources should be focused on assessing projects that are most important to the energy transition"*

1) The 'energy transition" is a lie, industry propaganda, and will not help the climate due to environmental and biosphere impacts, and overshoot of planetary boundaries
2) Who decides which projects are "most important" and on what basis? Who provides oversight for this process? Will the projects belonging to the mates of the ALP government, like Twiggy Forrest, be deemed "most important"? Will those which harm least biodiversity be deemed "most important"? Objectively, the most important projects have already been approved and built. Projects going forward will deliver increasingly less benefit versus environmental impact due to curtailment. So they are "least important" to the energy transition. What's most important is the remaining biodiversity and biosphere.

Draft recommendation 2.2

Set up a specialist 'strike team' for priority projects

The Department of Climate Change, Energy, the Environment and Water should set up a strike team focused on priority renewable energy projects. The strike team should:

• *be adequately resourced to ensure all priority projects can be efficiently assessed under the Environment Protection and Biodiversity Conservation Act 1999 (Cth)*

• *integrate environmental and clean energy expertise*

• *be issued with clear expectations, tools and escalation procedures*

• *work with state and territory counterparts to reduce duplication and share information and expertise.*

RESPONSE

Again, this is an abhorrent recommendation. Again, who decides what are "priority projects" and on what basis?

As it stands, no project is properly assessed under the EPBC Act as there are no independent environmental surveys, no valid offset procedures, and no independent monitoring of outcomes. Attempting to fast-track this process will make this situation worse. "Efficient assessment" does not obviously equate to more rigorous assessment, as environmental assessments take time, and to be done properly, require review over multiple seasons. More efficient assessment clearly means that environmental impacts will be even less rigorously documented and investigated and will be even less likely to be avoided-mitigated-offset. Integrating "clean energy expertise" means essentially that

environmental considerations will be sidelined in preference to other considerations such as profitability.

Draft recommendation 2.3

Establish a Coordinator-General for priority projects

The Australian Government should establish an independent Clean Energy Coordinator-General for priority renewable energy projects. The Coordinator-General should:

- *track the progress of all approvals needed to start construction*
- *investigate and help resolve delays*
- *report on progress to the Energy and Climate Change Ministerial Council*
- *provide advice based on objective criteria about the composition of the National Renewable Energy Priority List.*

RESPONSE

This again is an abhorrent and completely retrograde step for the environment and biodiversity.

A Coordinator-General is a position which is completely unaccountable to the public and presumably makes decisions which cannot be legally challenged. This would be another massive backwards step for environmental and biodiversity protection, in favour of industrialisation and mining of our remnant biodiversity and wilderness areas.

Calling this position "independent" belies the reality that the position is not independent and is fully accountable to the ruling government only. If he was fully independent the position would not be drafted in such a way, and the position would be fully accountable to the public.

Draft recommendation 2.4

Consider the energy transition in approval decisions

The Environment Protection and Biodiversity Conservation Act 1999 (Cth) should be amended to require the minister to consider the needs of the energy transition when deciding whether to approve an energy project that will have a significant impact on a matter of national environmental significance.

RESPONSE

Again, this recommendation is based on misrepresentations of the true nature of climate change and the appropriateness of destroying remaining biodiversity and ecosystems in this context. Destroying ecosystems and biodiversity for climate action is clearly ludicrous and cannot be defended. If the ALP Government and the Productivity

Commission were to take climate change seriously, they would prohibit the destruction of ecosystems and biodiversity. However, that would interfere with "productivity" and "growth", so they are fundamentally conflicted, and should not be offering advice regarding matters regarding climate change and biodiversity loss. If the Productivity Council members are of high integrity, they should realise that, and refrain from offering advice on matters outside of their scope. The only way that biodiversity protection might align somewhat with provision of "low emissions energy" is via nuclear power, and if they have integrity, that is what the Productivity Commission would be advising. Alas.

The economic benefits of faster approvals

A faster approvals process is expected to yield benefits for proponents, consumers and the wider economy.

A more efficient process will reduce the direct and indirect costs that proponents incur through the approvals process. Direct costs include the cost of collecting the various types of information regulators require (PC 2020b, p. 156). Indirect costs include delayed revenues caused by projects starting late and overheads, such as the cost of keeping consultants, contractors and internal resources on hold, while waiting for approval to start construction (PC 2020b, p. 157).

The Queensland Renewable Energy Council estimates that 'a 12-month delay in financial close on a $400 million project can add more than $20 million in holding and opportunity costs' (qr. 40, p. 4).

Many projects will be built as part of the transition to clean and reliable energy. AEMO (2024, p. 13) estimated that the upfront capital cost of all the required utility-scale generation, storage, firming and transmission infrastructure to 2050 has a present value of $142 billion (2024 dollars). If reforms to assessment processes reduce delays to construction, total cost savings could be significant. Reducing project costs for proponents will tend to produce electricity prices lower than would otherwise be the case.

Investing in cheaper, cleaner energy and the net zero transformation Inquiry interim report

Faster approvals would also allow more clean energy to come online faster. Available capacity would increase, contributing to power prices being lower than they otherwise would be, and consumers and the wider economy would benefit. Emissions reductions would be achieved and energy reliability improved. This all supports productivity growth.

RESPONSE

Faster approvals might generate more short-term growth and employment, but renewable energy employs very few people in the operations stage as opposed to the construction stage. That short-term growth cannot be sustained and obviously comes at considerable and unsustainable biodiversity and climate costs. Once the biodiversity and ecosystems are destroyed – they are gone forever and never coming back. What right does the unelected Productivity Commission have to mandate the unsustainable and irretrievable destruction of biodiversity and biosphere and climate, to enable short-term growth and profiteering by billionaires and foreign renewables companies and investors? Faster approvals mean basically only faster returns on investment. That's it.

The assumption that more rapid approvals will result in cheaper electricity is also a blatant lie. More renewables in the grid means more expansive electricity, more profiteering and more environmental destruction, through all the mechanisms I have extensively outlined above.

Addressing barriers to private investment in adaptation

Summary

The climate-related risks Australia faces in the future will be more costly if we do not adapt.

• Governments are moving to improve adaptation throughout the economy, including through the development of a National Adaptation Plan. This area will require significant policy focus over the long term.

• As climate risks intensify, boosting our resilience could lower the costs of disaster recovery and create a healthier, more productive population, with better quality of life.

Housing will require specific attention.

• People's experience of climate change will depend on the resilience of their home. Resilient housing reduces exposure to the health and wellbeing impacts of climate change and the disruption and displacement caused by natural disasters.

The information needed to drive homeowner investments in resilience is lacking.

• The Australian Government should lead work to develop a publicly accessible database of all climate hazards and an outcome-based resilience rating system for housing.

Building on those initiatives, Australian governments should work together and develop targeted policies to improve the resilience of Australia's housing stock over coming decades.

• Agreeing on quantifiable goals for improving the resilience of Australia's housing stock over the coming decades should anchor and focus actions, and provide clear signals to the community and market.

• All stakeholders have a role to play. Households need timely and relevant information. Some will need financial support. Governments should invest in public infrastructure where that is an efficient response.

Planning and zoning systems need to consider climate risks as Australia's population grows. Targeted measures will likely be needed to progressively lift the resilience of the existing housing stock.

• Governments will need further information and careful impact analysis to assess any regulatory or spending measures, and careful phasing will be critical in securing resilience benefits at lowest cost.

To support economy-wide adaptation, the Australian Government should legislate for the Climate Change Authority to take on responsibility for monitoring, evaluating and learning in adaptation policy.

• The Authority already plays a similar role regarding emissions reduction, but there is no national, independent body set up to drive accountability and ongoing improvement regarding adaptation.

RESPONSE

Again, this recommendation is completely deficient. Nowhere is there an acknowledgement that mass immigration is largely driving demand for new housing and there is no acknowledgement that rising population is increasing destruction of life-supporting ecosystems and biodiversity, and terrible for the climate as well as terrible in terms of local climate and weather effects. Each new house has a emissions burden of uo to 100 tons of CO2, and the climate burden is compounded by every extra person in our unsustainably growing population.

Simply talking about resilience here in the same document which claims to advocate for increased environmental protections and addressing climate change is scandalously deficient and simply a distraction on behalf of the ALP government's unsustainable and environmentally destructive policies.

"Planning and zoning systems need to consider climate risks as Australia's population grows. Targeted measures will likely be needed to progressively lift the resilience of the existing housing stock."

Why is there no criticism of mass immigration, and the increased biodiversity and ecosystems harms it brings, as well as increasing demands on unsustainable water supplies, and energy demands, which again compound ecosystems and biodiversity loss?

The Productivity Commission is utterly conflicted and not up to the task of providing high integrity and independent research; instead, it is intent on simply providing the recommendations which align entirely with government policy and desires.

The Productivity Commission has betrayed all those Australians who care about the environment, biodiversity and wildlife. The PC has betrayed all those who expected something better than the EPBC Act. The PC has completely ignored all the recommendations of the Auditor-General and the Samuel Report. Instead, what we have is a host of recommendations and empty words, the result of which will be the greenlighting of rapid environmental destruction in the guise of "climate action". I have not seen a worse report or list of recommendations in my life.

The Auditor- Generals Report

Here are some screenshots which highlight the Auditor-General's (ANAO) Report on the EPBC Act and its implementation by the Department of the Environment, the DCCEEW.

Key points:

- An Audit Office report has found severe issues with how Australia's national environment laws are administered
- Conservationists have branded the laws "fundamentally broken"
- The Government is currently reviewing the laws

In what conservationists have described as a "scathing indictment" of the Federal Government's handling of environmental protection, the Australian National Audit Office (ANAO) found the Department of Agriculture, Water and the Environment did not have adequate measures in place to oversee the national environment laws.

The Environment Protection and Biodiversity Conservation (EPBC) Act was put in place in 1999 to protect world heritage sites, biodiversity and other significant land and sea areas.

But the review concluded that in the decades since, administration of the Act had been poorly handled.

Overall, the audit found that despite the EPBC Act being subject to multiple reviews, audits and parliamentary inquiries since it began, the Department of Agriculture, Water and the Environment's administration of the laws is neither efficient nor effective.

While the government is focused on efficiency, the lack of effectiveness worries me most – especially findings concerning so-called "environmental offsets". These are measures designed to compensate for unavoidable losses, such as creating a nature reserve near a site to be cleared.

In the early years of the law, offsets were rare. By 2015 they featured in almost 90% of decisions, dropping to about 75% last year. In effect, we now rely on offsets to protect the environment.

The Auditor-General found that the absence of guidance and quality control for offsets has led to "realised risks".

For example, offsets must be mapped and disclosed publicly, to ensure their integrity. But not only did the department fail to create a public register, in 2019 it stopped loading offset data into its systems altogether. This makes it likely offsets will be forgotten and so either destroyed later, or put up a second time and thus double-counted.

Offsets aside, the Auditor-General higlighted key risks such as high volumes of unapproved land clearing for agriculture, and non-compliance in residential and mining developments. The department had proposed actions to address the issues, but made no progress on them.

And the report found arrangements to monitor whether approval conditions had been met before work started on a project were inadequate, which “leaves the department poorly positioned to prevent adverse environmental outcomes”.

At the end of the day, the federal department doesn’t have the tools to distinguish whether an environmental effect is the result of its own regulations, or other factors such as state programs or extreme weather. Essentially, it doesn’t know if the Act is delivering any environmental benefits at all.

"Despite being subject to multiple reviews, audits and parliamentary inquiries since the commencement of the Act, the Department of Agriculture, Water and the Environment's administration of referrals, assessments and approvals of controlled actions under the EPBC Act is not effective," it stated.

The report also cast a dim light on the adequacy of conditions issued to applicants, which are designed to mitigate environmental risks.

Conservationists say the laws are "fundamentally broken". *(Supplied: University of Wollongong)*

"Of the approvals examined, 79 per cent contained conditions that were non-compliant with procedural guidance or contained clerical or administrative errors, reducing the department's ability to monitor the condition or achieve the intended environmental outcome," the report said.

The Australian Conservation Foundation's James Trezise said the audit report showed Australia's key piece of environmental law was "fundamentally broken" and not equipped to deal with dual "extinction and climate crises".

"This report is a scathing indictment of the Federal Government's administration of our national environment law and highlights why we need a stronger law and a new independent regulator," he said.

> **"Despite five previous audits, the Department of Agriculture, Water and the Environment has failed in its duty to implement sound regulation to protect Australia's unique wildlife."**

The (ANAO) also found conflicts of interest were not appropriately managed.

"While the department has established sound oversight structures, they have not been effectively implemented," it states.

"Procedures for oversight of referrals, assessments and approvals by governance committees are not consistently implemented.

> **"Conflicts of interest are not managed."**

'Heads should roll' over report, critics say

Labor seized on the findings, with Shadow Environment Minister Terri Butler claiming the Government's mismanagement had hurt the environment.

Environment Minister Sussan Ley declined to be interviewed about the report. *(ABC News: Marco Catalano)*

"This government gets more things wrong, than it gets right," she said.

> **"This disastrous report proves that the Morrison Government is the problem on environmental protection and job delays for major projects."**

Greens Environment spokeswoman Sarah Hanson-Young declared "heads should roll" over the report.

"The report shows the Environment Minister and the federal department have failed to protect the environment and are, simply put, incompetent," she said.

"Enough is enough. There must be accountability, and it must be at the top. Not only do our environmental laws need an overhaul but clearly so does those who are in charge of administering them."

The ANAO Report was released during the term of the previous LNP government, but nothing has changed, in fact, it has become worse. And if the recommendations of the PC Report are followed, environmental protections will become worse again.

Main issues with the EPBC Act and its implementation:

- Assessments are not rigorous, objective or independent
- Significant impacts are ignored, not even avoided-mitigated-offset
- Offsets are relied on because impacts cannot be avoided or mitigated; however, offsets rely on a sham – protection of some other area and some unsupervised management is supposed to compensate for habitat destruction and fragmentation elsewhere; or even worse, offsets rely on cash payments for provision of habitat elsewhere which may or may not occur
- The DCCEEW in no way ensures that the outcomes of offsets provide the benefits to threatened and migratory species which are claimed
- The EPBC Act is not implemented for many developments which destroy habitat and may potentially contain threatened and migratory species
- The EPBC Act is only implemented when threatened species and ecosystems are present in significant numbers; there is no consideration paid to the overall carbon-sequestering and climate regulating functions of ecosystems, with or without threatened species
- There is a bureaucratic delay in listing threatened and migratory species and threatened ecosystems; state-listed species should automatically be listed federally to better protect endangered species and the environment.
- If a development has impacts which cannot be satisfactorily avoided-mitigated-offset without a sham process lacking integrity and oversight, then clearly the development should not be approved. They are almost always approved.

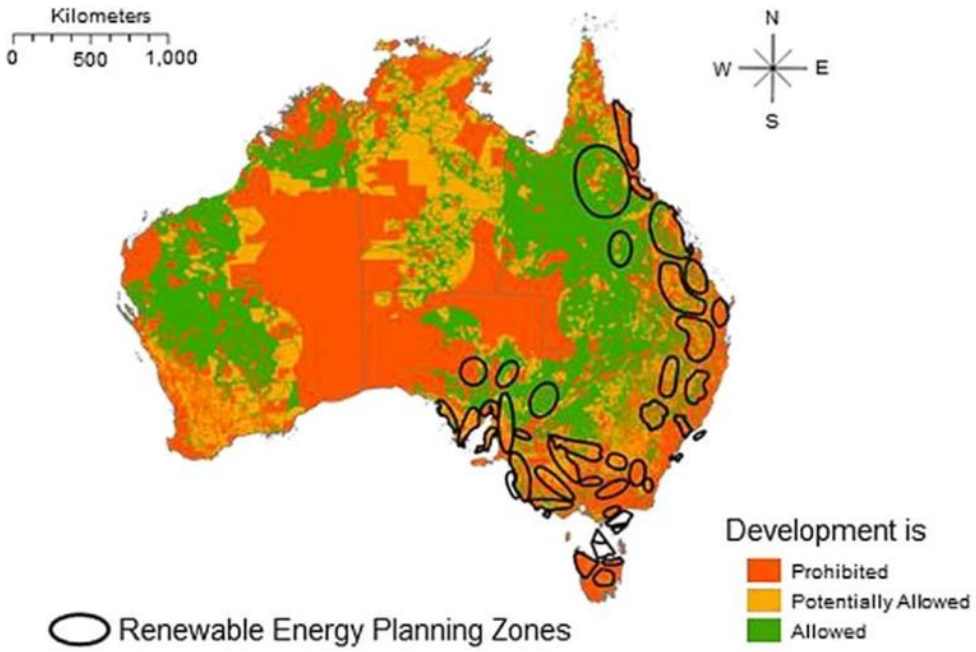
The Productivity Commission has addressed NONE of these established shortcomings.

NET ZERO

Brief Review of the Net Zero Report reveals many errors and paucity of documentation of and explanation of the authors' underlying assumptions.

- They refer to renewable energy as "clean energy" throughout, when acknowledgement and understanding of the many environmental issues surrounding clean energy reveal that it is anything but clean and green. It's not even "renewable"; the energy sources may be essentially "renewable" but the infrastructure required to capture it certainly is not and often recycling rates of various components are poor due to expense and energy required. This suggests lack of objectivity and industry capture.
- For transport there is an emphasis on hydrogen and ammonia. Hydrogen has now been virtually abandoned as a viable replacement of fossil fuels for transport, owing to numerous problems, not the least of which is energy expense in converting it to liquid form for transport, and its leakiness, its flammability, and its status as greenhouse gas itself. Ammonia has also been mooted for transport. However, the combustion of ammonia, when not carefully controlled in terms of temperature and available oxygen yields potent greenhouse gasses, way worse than CO2, such as N2O which is 273 times as potent as greenhouse gas as CO2. Even NOx chemicals are similar in potency as methane as greenhouse gasses.
- There is an assumption that EVs are emissions-free when in fact their upfront emissions are worse than ICE vehicles. If we are to consider the biomass loss inherent in mining for their materials, as in the case of Nickel mining, as mentioned above, it is quite possible that their carbon footprint is considerably worse than ICE cars. Also, they require rare earths and the emissions impact of rare earth mining is itself catastrophic.
- Biofuels are also mentioned. Their land use impacts are also horrendous, and need for increasing need for food in addition to increasing land use demand for agricultural lands conversion to biofuels will add to deforestation impacts.
- They acknowledge that domestic aviation demand will increase further. The authors are not able to objectively question the wisdom of population and economic growth. They do not acknowledge overshoot of planetary boundaries and are in fact climate change denialists.
- Nowhere is there an objective analysis of the emissions of VRE – they presumably assume that the emissions of wind energy are 11g CO2/kWh and solar is 48g CO2/Kwh as per the IPCC report. Also there is no analysis of the emissions of storage and the huge increases in electrical infrastructure.

- There is no consideration of biosphere impacts of destruction for renewable energy deployment, new mining for critical minerals, and new mining for fossil fuels for mining, and balancing and reserve. There is no analysis of loss of carbon sequestration as a result of these impacts. There is no analysis of the biodiversity and climate impacts of ecosystems fragmentation and edge effects.
- There contained plans for “afforestation” of 5.1 million hectares but no acknowledgement of the difficulty of achieving this with increased demands on land via population growth, agricultural industry, mining and biofuels. Much of the area slated for reforestation is in fact low rainfall and this may not be possible. This seems to be largely based on fantasy.
- There is mention of a “additional 3500km2 ‘crossover’ with key biodiversity areas its ambiguous as to what this entails. The authors assume all significant biodiversity occurs within “key biodiversity areas’. This is simply not the case. The designations are purely arbitrary and multiple wind farms with massive impacts on biodiversity have been proposed or are being built in areas which have not been designated as “key biodiversity” such as Chalumbin, Gawara Baya, Kaban, Mt Emerald, Lotus Creek and Clarke Creek wind farms. It is despicable that we are happy to sacrifice the lives of innocent wildlife for the pursuit of a futile and dangerous remedy to a problem which is of entirely our own making, climate change, when we should first be obviously reducing our impacts on the biosphere, not expanding them.
- The Net Zero report seems to be based on many flawed assumptions regarding the nature of climate change and the climate impacts of renewable energy and many other associated technologies such as EVs and hydrogen fuel.



The researchers proposed a 'traffic-light' approach to energy planning in Australia, where renewable energy development would be permitted in green areas, potentially allowed in yellow areas, and prohibited areas. The black circles indicate areas currently identified for renewable energy planning in Australia (courtesy of the researchers).

Figure 11 Researchers led by Prof James Watson have proposed a traffic light approach; however it seems the PC Report describes a situation which is even worse, a "strike force" will allow "important" RE projects anywhere

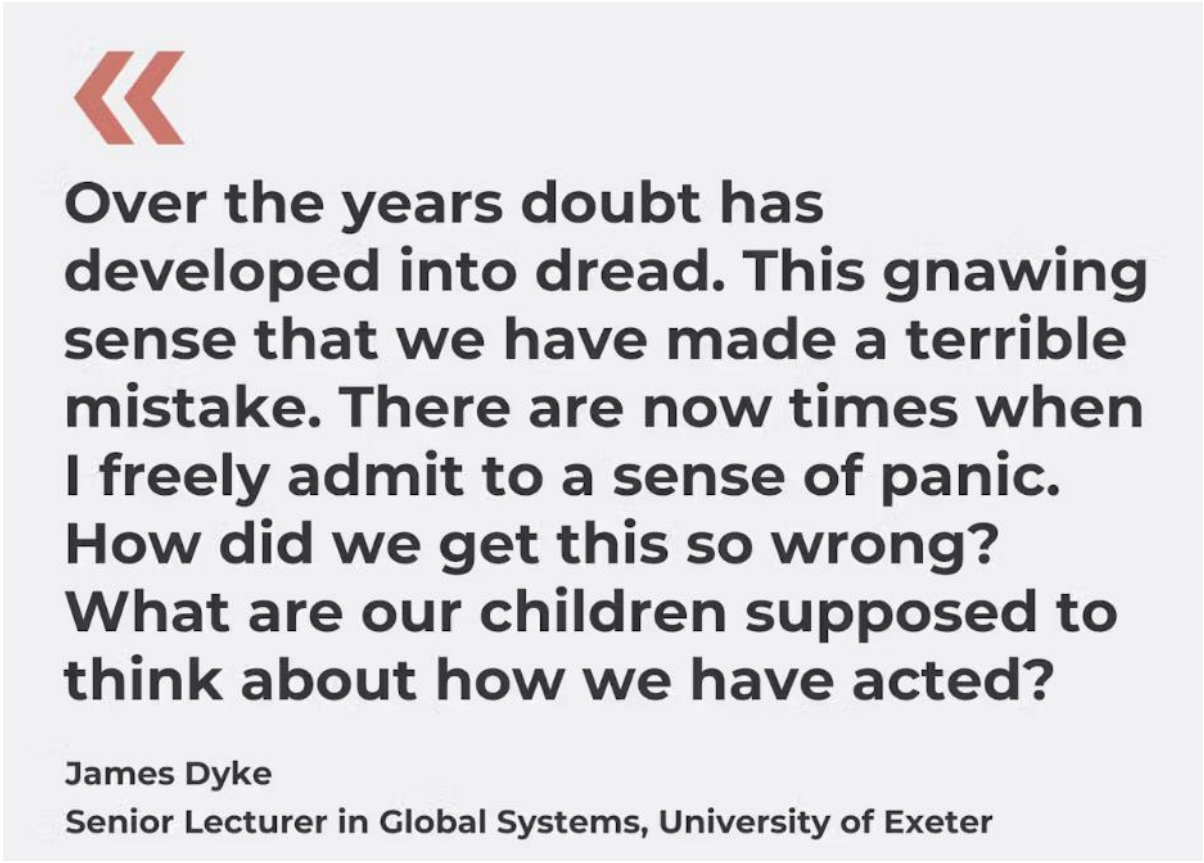


Figure 12 Excerpts from "Climate scientists: concept of net zero is a dangerous trap"[160]

"The threats of climate change are the direct result of there being too much carbon dioxide in the atmosphere. So it follows that we must stop emitting more and even remove some of it. This idea is central to the world's current plan to avoid catastrophe. In fact, there are many suggestions as to how to actually do this, from mass tree planting to high tech direct air capture devices that suck out carbon dioxide from the air.

The current consensus is that if we deploy these and other so-called "carbon dioxide removal" techniques at the same time as reducing our burning of fossil fuels, we can more rapidly halt global warming. Hopefully around the middle of this century we will achieve "net zero". This is the point at which any residual emissions of greenhouse gases are balanced by technologies removing them from the atmosphere.

This is a great idea, in principle. Unfortunately, in practice it helps perpetuate a belief in technological salvation and diminishes the sense of urgency surrounding the need to curb emissions now.

We have arrived at the painful realisation that the idea of net zero has licensed a recklessly cavalier "burn now, pay later" approach which has seen carbon

[160] Climate scientists: concept of net zero is a dangerous trap

emissions continue to soar. It has also hastened the destruction of the natural world by increasing deforestation today, and greatly increases the risk of further devastation in the future.
To understand how this has happened, how humanity has gambled its civilisation on no more than promises of future solutions, we must return to the late 1980s, when climate change broke out onto the international stage."

All this is true, but unfortunately climate scientists seem blissfully unaware of the true extent of mining required to attempt to reach "Net Zero", it's devastating biosphere impacts, and its increasing fossil fuel requirements.

They are entirely focussed on CO2 emissions and not increasing loss of CO2 sequestration and increasing concentration of all other greenhouse gasses. Some, like SF6 and NF3 are the direct result of renewable energy and electrification attempts.

But the authors are correct, there are no credible CO2 removal technologies, except trees. The industries they campaign for are orchestrating the destruction of remaining trees, ecosystems, and the biosphere, under the misguided belief that that will correct climate change while enabling more economic growth.

It's astonishing how the continual absence of any credible carbon removal technology seems to never affect net zero policies. Whatever is thrown at it, net zero carries on without a dent in the fender.

For some time I assumed I was merely ill-informed or over-cautious. I've now realised that we have all been subject to a form of gaslighting. Whether it's BECCS, afforestation, direct air capture or carbon absorbing unicorns, the assumption is that net zero will work because it has to work. But beyond fine words and glossy brochures there is nothing there. The emperor has no clothes.

James Dyke
Senior Lecturer in Global Systems, University of Exeter

It came to me as a real shock that I must have contributed personally to the net zero trap. In 2008 the G8 countries declared a voluntary target of reducing carbon dioxide emissions by 50% by 2050.

Back then, I responded by publishing computations I had performed specifically to show the need for net zero in the long run, stating that any remaining carbon dioxide emissions by human activities would have to be 'balanced by an artificial sink'.

But since none of our study's co-authors was an expert, we did not consider how much of that artificial sink would be needed to sustain our economic system, or if it was even technically possible to create.

Wolfgang Knorr
Senior Research Scientist, Physical Geography and Ecosystem Science, Lund University

The predecessor to net zero was and still is called 'offsetting'. Once I was full of hope that carbon offsetting schemes could do the trick and save intact forest ecosystems from almost certain destruction by economic development. Now I know this was just a dream.

The massive amount of offsetting needed for staying within safe climate limits cannot be met by leaving nature alone. It demands fast growing, mostly alien species that are cut down often and regularly, with devastating consequences for biodiversity. We are already seeing the beginning of it in European forests. I am scared almost more by the consequences of net zero, than by those of climate warming.

Wolfgang Knorr
Senior Research Scientist, Physical Geography and Ecosystem Science, Lund University

CONCLUSION

The Federal ALP Government commissioned a report from an institution which they knew would provide a report which was aligned with their policies and wishes.

The Productivity Commission has failed to provide an independent report of high integrity.

It has failed to address the needs and wishes of the wider community.

It has failed to address the shortcomings of the EPBC Act and its implementation by the DCCEEW and the Federal Government; instead, it has proposed to significantly destroy any integrity the EPBC Act may have had in favour of renewable energy and infrastructure. This will be clearly catastrophic for much biodiversity.

The Productivity Commission demonstrates that it does not understand the true nature of climate change and overshoot of planetary boundaries and provides no criticism of government policies which will destroy more of the climate-regulating biosphere. Instead, it advocates for higher productivity in ways which simply align with government policies.

The Productivity Commission clearly does not understand that many responses to climate change that the government proposes may in fact make climate change worse due to upstream and offshored impacts, as well as unsustainable destruction and fragmentation of ecosystems in Australia.