Appendix A – Objection to SSD – 9874 – MOD - 2
THE DARK SIDE OF "RENEWABLE" ENERGY

- **Environment Destruction, Toxic Technology, Toxic Waste**
- **Inefficient Technology, Outdated Technology**

ABSTRACT

The stated premise for the reduction in the man-made production of CO2, by the "anthropogenic climate change" believers, is to prevent an *existential threat* to human civilization and the environment. If this is the case, it is therefore critically important to consider the impact on human civilisation and the environment caused by wind farms, solar farms and batteries.

Compiled by Bill Stinson

20th January 2021

Appendix A – Objection to SSD – 9874 – MOD - 2

Is the proposed "remedy" worse than the perceived "problem"?

Is this a case of:

Destroy the "environment" to save the "environment."

UN Secretary- General, Antonio Guterres, at the R20 Austrian World Summit in Vienna on 15 May 2018, reiterated his belief that global warming posed an "existential threat" to humanity.

On the 11 January 2021 at the United Nations One Planet Summit, Antonio Guterres remarked:

"The main goal of the United Nations in 2021 is to build a truly global coalition for carbon neutrality. Every country, city and business must adopt an ambitious roadmap to achieve net zero emissions by 2050"

What is the "existential threat" as espoused by Antonio Guterres.

"In 2019, the phrase *existential threat* became increasingly common in consideration of the climate crisis, often discussed as an *existential threat* to human civilization and the environment as we know them" (*dictionary.com*).

What began as "global warming" in the 1980's has now morphed into "climate change" because of the failed predictions of imminent environmental destruction determined by numerous computer models. The Earth's climate having failed to act in accordance with those dire predictions of "catastrophic warming" is now the subject of indeterminate "climate change".

What is "carbon neutrality"? According to Antonio Guterres and the many disciples of the "climate change" belief, Carbon Dioxide (CO2) is the culprit, driving, as perceived by them, climate upheaval or "climate change". So, they believe, to prevent indeterminate "climate change", the man-made production of CO2 must be curtailed. This, according to them, means the phasing out of the use of fossil fuels for (among other things) electricity generation and replacing them with "green" generation of electricity by wind farms and solar farms backed up with batteries.

The stated premise for the reduction in the man-made production of CO2, by the "anthropogenic climate change" believers, is to prevent an *existential threat* to human civilization and the environment. If this is the case, it is therefore critically important to consider the impact on human civilisation and the environment by wind farms, solar farms and batteries.

"Renewable energy technologies, electric vehicles and battery storage require high volumes of environmentally sensitive materials. The supply chains for these materials and technologies need to be appropriately managed, to avoid creating new adverse social and environmental impacts along the supply chain."
(*UTS – Institute for Sustainable Futures – Responsible Materials Sourcing for Renewable Energy Report - April 2019, page i*)

Environment Destruction, Toxic Technology, Toxic Waste

Let us consider the life cycle phases of wind farms, solar farms and batteries:

Phase 1 – Raw material sourcing – Environment Destruction

"A global "gold rush" for energy materials will take miners into remote wilderness areas (that) have maintained high biodiversity because they haven't yet been disturbed."
(*Praeger University, Mark Mills – What's Wrong with Wind and Solar – at 3.06 https://www.youtube.com/watch?v=RqppRC37OgI&feature=youtu.be)*

"The mining industry necessarily uses oil for heavy machinery, often to generate electricity in remote locations. Global mining already uses nearly twice as much petroleum as the entire country of Germany, and that's before the emerging "gold rush" for energy minerals. The global push for Electric Vehicles will drive up demand for a variety of other energy minerals from 200% to 8,000%. Mining can be done responsibly, but new mines aren't likely to open in America or Europe. Consequently, a handful of environmentalists have begun to worry about the invasion of pristine and fragile ecosystems around the world in hot pursuit of mineral wealth."
(*Mark P Mills – Washington Examiner – Energy & Environment – "The Myth of the Great Energy Transition" – October 1, 2020)*

Phase 2 – Raw material mining – Environment Destruction, Human Rights Abuse, Toxic Waste

"The transition towards a renewable energy and transport system requires a complex mix of metals – such as copper, cobalt, nickel, rare earths, lithium and silver – many of which have only previously been mined in small amounts. Under a 100% renewable energy scenario demand for these metals could rise dramatically and require new sources of primary and recycled metals."
(*UTS – Institute for Sustainable Futures – Responsible Materials Sourcing for Renewable Energy Report - April 2019 page ii*)

"Demand from renewable energy and storage technologies could exceed reserves for cobalt, lithium and nickel, and reach 50% of reserves for indium, silver, tellurium. Reserves are the estimated amount of a mineral that can be economically mined under current conditions. Reserves are a subset of resources, which are the total known amount of a mineral for which extraction may potentially be feasible."
(*UTS – Institute for Sustainable Futures – Responsible Materials Sourcing for Renewable Energy Report - April 2019 page iii*)

"Mining to supply renewable energy technologies occurs in a large number of countries, but a smaller number of countries dominate production. China is the largest producer of metals used in solar PV and wind technologies, with the largest share of production for aluminium, cadmium, gallium, indium, rare earths, selenium and tellurium. In addition, China also has a large influence over the market for cobalt and lithium for batteries. While Australia is the largest producer of lithium.....The largest lithium mine, Greenbushes in Western Australia, is majority owned by a Chinese company. Similarly, while DR Congo mines more than half of the world's cobalt, '' '
(*UTS – Institute for Sustainable Futures – Responsible Materials Sourcing for Renewable Energy Report - April 2019 page 28*)

"Most of the world's rare earth ores are extracted near Baotou, Inner Mongolia by pumping acid into the ground, then processed using more acids and chemicals. Producing one ton of rare earth metals releases up to 420,000 cubic feet of toxic gases, 2,600 cubic feet of acidic wastewater, and a ton of radioactive waste. The resulting black sludge is piped into a foul,

lifeless lake. Numerous local people suffer from severe skin and respiratory diseases, children are born with soft bones, and cancer rates have soared."
(*The staggering human costs of "renewable" energy – Paul Driessen - Energy - August 9th 2020, page 1*)

"This report documents the hazardous conditions in which artisanal miners, including thousands of children, mine cobalt in the Democratic Republic of the Congo. It goes on to trace how this cobalt is in batteries. Using basic hand tools, miners dig out rocks from tunnels deep underground, and accidents are common. Despite the potentially fatal health effects of prolonged exposure to cobalt, adult and child miners work without even the most basic protective equipment. This report is the first comprehensive account of how cobalt enters the supply chain of many of the world's leading brands"
(DEMOCRATIC REPUBLIC OF CONGO: "THIS IS WHAT WE DIE FOR": HUMAN RIGHTS ABUSES IN THE DEMOCRATIC REPUBLIC OF THE CONGO POWER THE GLOBAL TRADE IN COBALT - Amnesty International Report - 19 January 2016, pdf page 92)

The pollution resulting from rare-earth mining has created soil incapable of supporting crops and water supplies have been contaminated.

"Chinese officials have attempted to counteract these threats by shutting down a large number of mines, especially the smaller and the illegal ones, but there are still severe, large-scale threats that remain unresolved. From north near the Mongolian border to south in Guangdong, China is struggling to clean-up the environment polluted by mining and some claim they are making things worse. The clean-up process is expensive and time-consuming, and some say it could be 50-100 years for the environment to recover."
(How Rare-Earth Mining Has Devastated China's Environment BY EARTH.ORG ASIA JUL 14th 2020)

"Several types of wind turbine, such as the permanent magnet synchronous generator (PMSG), require magnets that orient wind turbines into the wind. These magnets contain rare metals such as neodymium (Nd), praseodymium (Pr), terbium (Tb), and dysprosium (Dy). The estimated demand for Nd is projected to increase from 4000 to 18,000 tons by 2035, and for Dy from 200 to 1200 tons. These values represent a quarter to a half of current world output. There are also concerns over the amount of toxic and radioactive waste generated by these mining activities."
"Energies - MDPI.com - Energy and Climate Policy—An Evaluation of Global Climate Change Expenditure 2011–2018. Published 16 September 2020"

Phase 3 – Raw material processing - Environment Destruction, Human Rights Abuse, Toxic Waste

"While Australia is the largest producer of lithium, the majority of this is shipped to China for processing.....Similarly, ... China is the leading producer of refined cobalt.....With a large share of the manufacturing of solar PV and lithium-ion batteries, China is also a large end-market for many of the metals, as well as the largest market for the technologies. Australia, Chile, DR Congo and South Africa have large shares of the production of metals for lithium-ion batteries. Japan, Korea, Canada and Russia have significant production levels of metals for PV, in addition to China '' '
(*UTS – Institute for Sustainable Futures – Responsible Materials Sourcing for Renewable Energy Report - April 2019 page 28*)

"The manufacture of solar panels requires significant natural resources including quartz, coal, silver, copper and highly toxic rare earth elements. Mining those resources is damaging to the environment and destroys habitats.

Processing those natural resources requires generation of significant amounts of electricity. In particular, construction of photovoltaic (PV) cells (i.e. solar cells) requires the extraction of silicon from quartz (i.e. silicon oxide) using carbon. "The first step of solar PV production is gathering, transporting and burning millions of tons of coal, coke and petroleum coke – along with charcoal and wood chips made from hardwood trees – to smelt > 97% pure mg-Si from quartz". Large quantities of coal, coke, charcoal and woodchips must be burnt, with a

consequential substantial release of CO2 into the atmosphere. A “vast amount of deforestation [is] necessary for solar PV production”
(Why Do We Burn Coal and Trees to Make Solar Panels? Thomas Troszak, 14 November 2019, para 2, paras 3 and 15 and reference notes [14] to [16])

“They’ve long wanted a totally electric vehicle (EV) fleet, which they claim would be clean, ethical, climate-friendly and sustainable. Of course, those labels hold up only so long as they look solely at activities and emissions within California state boundaries – and not where the mining, manufacturing and electricity generation take place. That kind of “life cycle” analysis would totally disrupt their claims.
Consider copper. A typical internal combustion engine uses about 50 pounds (23 kilograms) of this vital everyday metal, the International Copper Association says. A hybrid car requires almost 90 lb (40 kg); a plug-in EV needs 132 lb (60 kg); and a big electric bus can use up to 812 lb (369 kg) of copper. If all 15,000,000 California cars were EVs, they would need almost 1,000,000 tons of copper.

But copper ores average just 0.5% metal by weight, notes energy analyst Mark Mills. That means 200,000,000 tons of ore would have to be dug up, crushed, processed and refined to get that much copper. Almost every step in that process would require fossil fuels – and emit carbon dioxide and pollutants.”
(*The staggering human costs of “renewable” energy – Paul Driessen - Energy - August 9th 2020, page 1*)

Phase 4 – Approval – Supply Chains – Modern Slavery, Human Rights Abuse?

“This Act requires entities based, or operating, in Australia, which have an annual consolidated revenue of more than $100 million, to report annually on the risks of modern slavery in their operations and supply chains, and actions to address those risks. Other entities based, or operating, in Australia may report voluntarily.

The Commonwealth is required to report on behalf of non-corporate Commonwealth entities, and the reporting requirements also apply to Commonwealth corporate entities and companies with an annual consolidated revenue of more than $100 million.”
(Commonwealth of Australia – Modern Slavery Act No 153, 2018 Clause 3)

“Part 3 Supply chains
24 Transparency of supply chain”
(Modern Slavery Act 2018 No 30 [NSW])

“One of the most shocking new developments since the Conservative Party Human Rights Commission’s previous report in 2016 is the revelation that forced labour is now used throughout China in factories which are part of the supply chains of major international corporations. This is revealed through evidence presented directly to our inquiry by several oral witnesses and in several written submissions, and detailed particularly in the report by the Australian Strategic Policy Institute (ASPI) titled *Uyghurs for Sale: ‘Re-education’, forced labour and surveillance beyond Xinjiang.* That report claims that “the Chinese government had facilitated the mass transfer of Uyghur and other ethnic minority citizens from the far western region of Xinjiang to factories across the country. Under conditions that strongly suggest forced labour, Uyghurs are working in factories that are in the supply chains of at least 83 well-known global brands in technology, clothing and automotive sectors, including Apple, BMW, Gap, Huawei, Nike, Samsung, Sony and Volkswagen.”
(The Darkness Deepens – The Crackdown on Human Rights in China 2016-2020 – The Conservative Party Human Rights Commission – January 2021, page 47)

“As US moves to renewable energy, wind turbines from Xinjiang may get caught in political tempest.

- Xinjiang-based Goldwind has supplied material for a large US project that will deliver clean wind power for Microsoft.
- As more information emerges about **the suspected use of forced labour in the region**, the US government has begun restricting trade from the area."

(https://www.scmp.com/news/china/article/3115771/us-moves-renewable-energy-wind-turbines-xinjiang-may-get-caught - US-China Relations, Jacob Fromer and Cissy Zhou 30 December 2020)

"EU-China Comprehensive Agreement on Investment opens manufacturing options, dodges forced-labour issues

The European Commission has finalized its long-anticipated investment agreement with China. While some renewable energy businesses might benefit from improved investment security, IP protection and access to legal remedies in China, the Commission did not address the issue of Uyghur forced labour in China. As a majority block in the European Parliament had previously demanded from the Commission to develop a firm policy to end forced labour in China, there is reason for doubt that the agreement as it stands will be adopted by the EU Parliament."

(PV Magazine – January 13, 2021)

Phase 5 – Fabrication – Large Scale Environment Destruction

"Wind power is not carbon neutral nor environmentally neutral. The construction of a 2 MW wind turbine requires approximately 150 tonnes of coal to make the required steel and concrete with the consequent CO2 emissions. They also require carbon-fibre, resins and rare-earth elements."

(Wind Turbines Are Neither Clean Nor Green And They Provide Zero Global Energy, Matt Ridley, The Spectator, 30 December 2017)

"Among the original group of domestic producers, Goldwind Science and Technology Co. Ltd. (Urumqi, Xinjiang Province) is China's oldest, largest and most experienced manufacturer. Goldwind's 20 percent share of the Chinese market in 2005 has grown, some sources say, to as much as 40 percent, thanks not only to the Renewable Energy Law's local-content mandate but its early push to produce turbines of 1.5 MW and larger, as well.

Goldwind was founded in 1997 when Urumqi-based parent company Xinjiang Wind Energy Co. Ltd. bought a license to manufacture 600-kW wind turbines from Jacobs Energie GmbH, now part of global turbine manufacturer REpower Systems AG (Hamburg, Germany). Goldwind turbines are 90 percent locally produced, including the rotor blades, which are supplied to Goldwind by Zhonghang (Baoding) Huiteng Windpower Equipment Co. Ltd. (Baoding, China).

(Composite World – High Wind in China 7 January 2007)

"With the State support, a batch of wind turbines and parts manufacturing businesses started to exert their main role in technology innovation in various forms, and strived to have their own intellectual property rights (IPR), with some achievements having been made. Goldwind has purchased Vensys based in Germany, which was a design partner of Goldwind in new MW-level turbine design. Thus, Goldwind is now firmly controlling IPRs of dominant products and the technology development rights for new products."

(Chinese Renewables Status Report, October 2009)

"Goldwind in Australia:

- Australia: Agnew Gold Mine - GW140/3000 https://edlenergy.com/
- Australia: Biala (AU) - GW140/3400 https://bialawindfarm.com/
- Australia: Gullen Range - GW82/1500 http://gullenrangewindfarm.com
- Australia: Moorabool North - GW136/3000 Official website: http://mooraboolwindfarm.com/
- Australia: Moorabool South - GW136/3000
- Australia: Mortons Lane Wind Farm - GW82/1500 http://www.newen.de
- Australia: Stockyard Hill - GW140/3000 https://www.stockyardhillwindfarm.com.au/
- Australia: White Rock - GW121/2500 http://www.whiterockwindfarm.com
- Australia Cattle Hill https://cattlehillwindfarm.com/

https://www.thewindpower.net/manufacturer_en_71_goldwind.php

"China, the world's biggest manufacturer of photovoltaic products, had silicon wafer production capacity of 173.7 gigawatts (GW) by end 2019, accounting for 93.7% of the world's total, according to China Photovoltaic Industry Association.

It also took 77.7% of the world's solar panel production capacity, 69.2% of photovoltaic modules capacity and 69% of polycrystalline silicon capacity in 2019. Overcapacity is expected to exacerbate alongside the drop of solar station installation in China, which saw new installed solar power capacity fall 32% in 2019 from a year earlier."

(By Reuters Staff - Reporting by Muyu Xu and David Stanway; editing by David Evans)

Phase 6 – Transportation

"Throughout the solar PV manufacturing process all of the materials and products must be shipped to and from more than a dozen countries around the world in large barges, container ships, trains or trucks – all powered by non-renewable oil"
(Why Do We Burn Coal and Trees to Make Solar Panels? Thomas Troszak, 14 November 2019, para 13.)

Phase 7 – Construction - Environment Destruction, Tenuous Supply Chain, Toxic Waste

"Building one wind turbine requires 900 tons of steel, 2,500 tons of concrete and 45 tons of nonrecyclable plastic. Solar power requires even more cement, steel and glass—not to mention other metals. Global silver and indium mining will jump 250% and 1,200% respectively over the next couple of decades to provide the materials necessary to build the number of solar panels, the International Energy Agency forecasts. World demand for rare-earth elements—which aren't rare but are rarely mined in America—will rise 300% to 1,000% by 2050 to meet the Paris green goals. If electric vehicles replace conventional cars, demand for cobalt and lithium, will rise more than 20-fold. That doesn't count batteries to back up wind and solar grids."
(The International Chronicles - THE DESTRUCTIVE MYTH OF GREEN ENERGY: IF YOU WANT 'RENEWABLE ENERGY' GET READY TO DESTROY THE ENVIRONMENT - August 6, 2019)

"Renewable energy has developed itself a reputation as being environmentally friendly. This report will show that this reputation is entirely undeserved. Far from improving the world around us, wind, solar, biomass and even hydropower can be highly damaging. A renewables revolution on the scale envisaged by global warming activists will see our landscapes desecrated, our fields industrialised or turned to monocultures, and our wildlife slaughtered.

Far from making the world a better place, renewable energy will destroy all we hold dear.

Is this really what environmentalism has come to mean?"
(GREEN KILLING MACHINES – The impact of renewable energy on wildlife and nature – Andrew Mountford – GWPF Report 36, page vii)

Phase 8 – Operation - Environment Destruction, Flora and Fauna Destruction, Inefficient Technology

"Solar farms require vast areas of land to generate power. For example, 25 square kilometres has been required to generate 850 MW in China and 52.5 square kilometres to generate 2,050 MW in India."
(Pavagada Solar Park, India)

"Report on bird and avifauna mortality commissioned by AGL Energy for its Macarthur Wind Farm found that 10.19 birds were killed by each turbine in a 12 month period. (Section 5.4 - 2015 Senate Select Committee on Turbines Report). Based on the the aforementioned report the number of birds (which would possibly include some Vulnerable and Endangered species

of Australia's unique birds) killed by AGL wind farms is estimated to be 44,302 as at 16 November 2020

The enormity of damage to fauna, flora and the landscape is self-evident from those statistics".
(Bat and Avifauna Mortality Monitoring March 2013 to February 2014. Prepared for AGL Energy Limited, June 2014)

''Äustralia is one of only 17 'megadiverse' countries, which together contain more than two-thirds of the world's plant and animal biodiversity. It is home to more animal species than any other developed country, and a whopping 87 per cent of our mammals, 45 per cent of our birds, 93 per cent of our reptiles and 94 per cent of our amphibians are found nowhere else on Earth."
(FAUNA. Australia's Most Curious Creatures – Tania Mc Cartney – ISBN: 9780644279545)

"The destructive nature of renewables is illustrated by the abandonment, on environmental grounds, in 2017, by Michael Schellenberger, 2008 Time magazine Hero of the Environment, of his previous support for solar and wind power and the rejection, on environmental grounds, of solar and wind power in Michael Moore's 2020 "Planet of the Humans"".
(Why Renewables Can't Save the Planet - written by Michael Shellenberger – 27 February 2019)

"The life of solar panels is also subject to shortening because they are susceptible to significant damage by severe storms, with or without hail. The risk of damage in NSW is illustrated by the severe hailstorm of 11 November 2016 that struck far western to central NSW, ranging from Broken Hill to Bathurst and north to Tamworth, with hail the size of golf balls and severe winds removing roofs from houses, smashing windows and damaging cars in Broken Hill"
(Severe Hailstorm Cuts Power to Thousands of Homes in Broken Hill, Bathurst and Tamworth, abc.net.au/news/2016-11-12)

In January 2020, golf ball-sized hail, weighing about 20 grams each, damaged the solar panels on the roof of the CSIRO building in Canberra.

"The significance of the risk of damage (to solar panels) is evident having regard to the facts that the Central West of New South Wales contains hot spots for hailstorms, such as Armidale and Orange."
(Take Cover: 50 Hailstorms in Six Months Shows We're a Hot Spot, Central Western Daily, 14 June 2017)

Phase 9 – Demolition and Rehabilitation

"22.15 Responsibilities for decommissioning and disposal - UPC will be responsible for decommissioning and rehabilitating the land within the development footprint. No cost is expected to be borne by Uralla Shire Council or the local community in this process. UPC has entered into agreements with project landholders, which include appropriate measures to ensure sufficient funds are available for decommissioning and rehabilitation.

At the end of the project's operational life, the PV modules will either be reused or recycled. UPC anticipates that at the time of decommissioning, there will be significantly more recycling options available within Australia. In 2016, the International Renewable Energy Agency (IRENA) reported that up to 85% of the material within PV modules is able to be recycled (IRENA 2016). There may also be opportunities to reuse the PV modules. In lieu of an Australian based solution, the PV modules will be sent overseas for disposal through one of many established PV module recycling programs. The project will have suitable insurances in place to rehabilitate or repower the facility should a natural disaster occur and cause extensive damage to project infrastructure."
(Extract from Report by EMM for UPC Renewables – New England Solar Farm – page 104)

"Monitoring, compliance, enforcement and assurance under the EPBC Act is ineffective. There has been limited activity to enforce the Act over the period of 20-years it has been in effect, and the transparency of what has been done is limited.

The culture of monitoring, compliance, enforcement and assurance is not forceful. This erodes public trust in the ability of the law to deliver environmental outcomes.

There is broad consensus from the regulated community and the experts that advise them that it is not easy to comply with the EPBC Act. Likewise, for the Department, the complexity of the Act impedes compliance, enforcement and assurance.

The monitoring, compliance, enforcement and assurance powers in the EPBC Act are outdated. Powers are restrictive and can only be applied in a piecemeal way across different parts of the Act due to the way it is constructed.

Monitoring, compliance, enforcement and assurance activities are significantly under-resourced."
(Independent Review of the EBPC Act – Interim Report – June 2020 – Professor Graeme Samuel AC - page 92)

Comment: The above extract from the Report by EMM for UPC Renewables in relation to the proposed New England Solar Farm is typical of many of the "end of the project's operational life" clauses in solar and wind farm Environmental Impact Statements. These clauses are incorporated to "include appropriate measures to ensure sufficient funds are available for decommissioning and rehabilitation."

However, the Independent Review of the Environment Protection and Biodiversity Conservation Act (EPBC Act) found that:

"Monitoring, compliance, enforcement and assurance under the EPBC Act is ineffective. There has been limited activity to enforce the Act over the period of 20-years it has been in effect, and the transparency of what has been done is limited."

"Monitoring, compliance, enforcement and assurance activities are significantly under-resourced."

There is no national register which enables checking of compliance with wind farm and solar farm environmental obligations, nor is there a national register which confirms that sufficient funds "are available for decommissioning and rehabilitation" of wind farms and solar farms installations at the "end of the project's operational life."

This failure by authorities to monitor compliance, including the availability of sufficient decommissioning and rehabilitation funds will, in my opinion, lead to abandoned wind farms and solar farms with decommissioning and rehabilitation costs to be met by the landholders or ultimately the public.

Phase 10 – Disposal - Environment Destruction, Toxic Waste

"For PV panels, significant volumes of crushed glass (~ 37,000t by 2035) and Aluminim (~ 11,500t by 2035) are recovered by the low recovery pathway that represents a major fraction of the total waste volume (~ 80 %), however, valuable silicon and other metals are not recovered without further processing. While the low recovery pathway operates at industrialised scales overseas and can potentially recover ~80 % of the material (frames, glass, junction box) this assumes that the crushed glass meets market specifications and further clarification from glass reprocessors is required. Given PV recycling is very immature in Australia this remains uncertain without further research. Considering the unrecovered material (~20% or 11,500 tonnes by 2035 according to the low recovery pathway), this could present a significant process risk by producing a contaminated residual stream (glass fines, polymeric binders, metals) that requires further treatment or disposal. While a range of

treatment processes are being investigated, further R&D is required. Chemical processes investigated for delamination and metal recovery use solvents and would likely produce a liquid waste stream.

This analysis assumes the short lifespan (15 years) has a significant impact on the estimated waste volumes and the totals reported do not consider a collection rate that would likely be very low in the near term without policy intervention."
(University of Technology, Sydney (UTS) Scoping study for photovoltaic panel and battery system reuse and recycling fund - Prepared for NSW Department of Planning, Industry and Environment by UTS Institute of Sustainable Futures & Equilibrium Consulting, March 2020)

General comment: The named recovered volumes seem ridiculously low. They must be based on the relatively small area of currently existing panels. For example, if the existing solar panels could generate 3,000 MW (nameplate), they would occupy 80 square kilometres. How could 80 square kilometres of solar panels produce only 37,000 tonnes of crushed glass and only 11,500 tonnes of aluminium?

"Tens of thousands of aging wind turbine blades are coming down from steel towers around the world and most have nowhere to go but landfills. In the U.S. alone, about 8,000 will be removed in each of the next four years. Europe, which has been dealing with the problem longer, has about 3,800 coming down annually through at least 2022, according to Bloomberg NEF. It's going to get worse: Most were built more than a decade ago, when installations were less than a fifth of what they are now. "The wind turbine blade will be there, ultimately, forever," said Bob Cappadona, chief operating officer for the North American unit of Paris-based Veolia Environment SA, which is searching for better ways to deal with the massive waste.
"Most landfills are considered a dry tomb. The last thing we want to do is create even more environmental challenges."
(Bloomberg Green - By Chris Martin February 5, 2020)

"The non- recyclable wind turbine blades must be buried because their fibre contents prevent them from being able to be cut up"
(SRSrocco report "*The Renewable Green Energy Myth: 50,000 tonnes of non-recyclable wind turbine blades dumped in landfill*", 9 January 2020)

The problem of solar panel disposal "will explode with full force in two or three decades and wreck the environment "because it is a huge amount of waste and they are not easy to recycle" *Michael Shellenberger –23 May 2018*

"The increasing waste stream from Australia's transition to renewable energy systems risks posing a major future waste management issue while detracting from the other benefits of renewable energy.

The International Energy Agency (IEA) forecast that Australia will have one of the most significant accumulated PV waste streams in the world. The recent market analysis by Sustainability Victoria (SV) indicated that PV systems will enter the waste stream in significant quantities from mid-2020, resulting from the solar boom in 2010 that was incentivised by generous feed-in-tariffs and federal government subsidies. It was estimated that approximately 100,000 tonnes of PV panels will enter the waste stream by 2035 Australia-wide, including approximately 30,00 tonnes in NSW. In the case of batteries, Australia is one of the leading markets worldwide for energy storage batteries. However, only 3-5% of all batteries (not including used Lead Acid batteries [LAB]) in Australia are collected for recycling." *(University of Technology, Sydney (UTS) Scoping study for photovoltaic panel and battery system reuse and recycling fund - Prepared for NSW Department of Planning, Industry and Environment by UTS Institute of Sustainable Futures & Equilibrium Consulting, March 2020)*

Outdated Technology, Inefficient Technology

“More than $1 billion is spent in Australia every year on distributed photovoltaic systems, from small household systems to 100MW-plus power stations. In every case, the systems are real power stations that form part of the electricity infrastructure of this nation. If we spent $1 billion every year on a new coal-fired power station we would demand rigour and controls to ensure we were getting what we paid for and that it would function as it was specified to function. Why should PV solar be any different?

Solar panels are often regarded as a commodity and a technology that is 100% reliable. They can be.

Most solar panels are made using silicon solar cells. Silicon is almost over-qualified for the job of making electricity; a bit like using a racehorse to collect mail at the end of a driveway. Although it may be over-qualified, silicon solar cells are nonetheless thoroughly reliable and capable of doing the job for decades.

There are many exceptions, but in general Australia has only an emerging culture of checking panel quality. Various reasons are cited for not testing, such as: “The manufacturer has guaranteed the panel performance,” or, “No-one else has had any problems with poor panel performance in Australia,” and, “No-one else does any testing.”

Each of those assertions is false. If it is not checked, what is the value of a manufacturer’s guarantee? Problems are rarely advertised but they do exist. On a global scale, Australia has one of the lowest rates of panel testing. In many other countries, testing is mandatory before a solar plant can be financed.”
(The solar PV panel problem: high promises, low quality – Ecogeneration - Dr Michelle McCann - August 30, 2017)

“With today’s technology, $1 million worth of utility-scale solar panels will produce about 40 million kilowatt-hours (kWh) over a 30-year operating period. A similar metric is true for wind: $1 million worth of a modern wind turbine produces 55 million kWh over the same 30 years. Meanwhile, $1 million worth of hardware for a shale rig will produce enough natural gas over 30 years to generate over 300 million kWh. That constitutes about 600% more electricity for the same capital spent on primary energy-producing hardware.”
(The “New Energy Economy” – An exercise in Magical Thinking” – Mark P Mills – Manhatten Institute Report – March 2019)

“The results below only account for the cost comparisons for capital and running costs of the generation installations themselves and the actual electrical power generated accounting for the measured productivity capability of each generating technology. Thus, these figures represent the true comparative cost of the power produced by Weather Dependent Renewables installations.

US EIA costs 2020: 1€ ≅ 1 US$

	EU(28) productivity / load factor	capital cost accounting for productivity	long-term cost accounting for productivity
onshore wind	21.2%	6.2 €bn/GW	22.4 €bn/GW
offshore wind	37.0%	11.8 €bn/GW	53.1 €bn/GW
solar PV	12.7%	10.5 €bn/GW	42.0 €bn/GW
gas-fired	90.0%	1.1 €bn/GW	3.5 €bn/GW
nuclear	90.0%	6.7 €bn/GW	16.1 €bn/GW

The costs projected here ignore the ancillary costs inevitably associated with wind power and solar renewables resulting from:

- unreliability in terms of both power intermittency and power variability.
- the non-dispatchablity of renewables: the wind will not blow and clouds will not clear away to order when needed.
- poor timing of power generation, often unlikely to be coordinated with demand: for example, Solar energy is virtually absent in winter, 1/9th of the output than in the summer period of lower demand.
- long transmission lines to remote generators, incurring both costly power losses in transmission and increased maintenance.
- additional infrastructure necessary for access.
- the costs of essential back up generation only used on occasions but wastefully running in spinning reserve nonetheless.
- any consideration of electrical storage using batteries, which would impose very significant additional costs, were long-term, (a few days), battery storage even economically feasible.
- unsynchronised generation with lack of inherent inertia to maintain grid frequency.
- Weather Dependent Renewables cannot be relied upon to provide a “black start” recovery from a major grid outage.

Importantly, in addition, these cost analyses do not account for:

- inevitable environmental damage and wildlife destruction resulting from Weather Dependent Renewables
- The “Carbon footprint” of Weather Dependent Renewable technologies: they may never save as much CO2 during their service life as they are likely to require for their materials sourcing, manufacture, installation, maintenance and eventual demolition. When viewed in the round, all these activities are entirely dependent on the use of substantial amounts of fossil fuels as feedstocks or as fuels.
- The Energy Return on Energy Invested: Weather Dependent Renewables may well not produce as much energy during their service life as was needed for their original manufacture and installation. They certainly do not provide the regular excess power sufficient to support the multiple needs of a developed society.”

(The Excess Costs of Weather Dependent Renewable Power Generation in the EU (28): 2020 – Edmhdotme – Charles Rotter – 8 June 2020)

Solar Farms, Wind Farms, Batteries – Who Benefits? Who Pays?

"Finally, Ms. Toplensky points out that, "Globally, clean-energy investment is now expected to account for half of total investment in the entire energy sector this year (2020), according to UBS." This may be true, but the benefits of these huge government expenditures may prove disappointingly small. According to the BP Statistical Review, in the year 2000, fossil fuels accounted for 87% of world energy use with renewables (excluding hydro) accounting for less than 1%. In 2018, after billions of dollars spent jamming renewable energy into the market, fossil fuels account for 85% of world energy use and renewables less than 5%. Not much of a transition so far.

Investors are of course always free to risk their money on firms reliant on government handouts for their business success. Shareholders of these companies should remember, however, that governments can withdraw this support just as easily as they can extend it. As consumers begin to see how little they are getting for the billions spent on renewable energy, these shareholder returns could easily vanish into air. I've left for another day a discussion of whether "renewable" is even the right word for solar and wind projects that require fossil-fueled mining, construction, transportation, infrastructure, and regular replacement. Caveat investor." *(Wind and solar are Competitive with Fossil Fuels only in Subsidized Price, not in True Cost - By Bruce Everett PhD - August 2020)*

"The head of $3.7 billion Melbourne fund manager Munro Partners has described climate change as the biggest investment opportunity since the advent of the internet.

Munro Partners chief investment officer Nick Griffin said he expects $21 trillion in capital to shift from old carbon intensive industries to green technologies over the next 30 years, offering an enormous opportunity for investors.

"The one before, it was the internet. This is the next one," he said at GSFM's market outlook forum on Tuesday. "The decarbonisation of the planet is going to happen. Period. There are just too many stakeholders that are on board here.""
(https://www.smh.com.au/business/banking-and-finance/great-place-to-invest-top-investor-says-climate-change-is-the-biggest-opportunity-since-the-internet-20210119)

Comment: Who Benefits and Who Pays?
Investors expect returns on their investments. So, the $21 trillion in capital, as stated by Nick Griffin of Munro Partners in the Sydney Morning Herald article published on 19 January 2021, will be expected to be repaid with interest.

It's obvious that investors expect to benefit from the $21 trillion investment so it will therefore be consumers and businesses who will have to repay the $21 trillion with interest. As Mark P Mills articulated in his March 2019 Manhatten Institute Report "*The "New Energy Economy" – An exercise in Magical Thinking"*:

"With today's technology, $1 million worth of utility-scale solar panels will produce about 40 million kilowatt-hours (kWh) over a 30-year operating period. A similar metric is true for wind: $1 million worth of a modern wind turbine produces 55 million kWh over the same 30 years. Meanwhile, $1 million worth of hardware for a shale rig will produce enough natural gas over 30 years to generate over 300 million kWh. That constitutes about 600% more electricity for the same capital spent on primary energy-producing hardware."

Based on the stated energy outputs in the Mark P Mills report, an investment of 3.5 trillion in natural gas would produce the same energy output over 30 years as the 21 trillion investment in "green" technologies. The "green" technologies option, in my opinion, is an option without the best interests of consumers and businesses being considered.

Is “climate change” following on from “tulip mania” (1637), “South Sea Bubble” (1720), “Mississippi Bubble” (1720), the “Y2K bug” (2000) and the 2008 “Global Financial Crisis” which was triggered by, as stated in the “**Wall Street and the Financial Crisis: Anatomy of a Financial Collapse”** report issued on April 13, 2011 by the United States Senate Permanent Subcommittee on Investigations:

"the crisis was not a natural disaster, but the result of high risk, complex financial products, undisclosed conflicts of interest; and the failure of regulators, the credit rating agencies, and the market itself to rein in the excesses of Wall Street."

Again, in my opinion, the investment in “green technologies” can be demonstrated as involving:

“high risk, complex financial products, undisclosed conflicts of interest; and the failure of regulators, the credit rating agencies, and the market itself to rein in the excesses of green investments!”

Summary

For me, this enquiry into the reasoning behind the drive to fundamentally change the generation and delivery of electricity in Australia, started in earnest about 2 years ago. My profession as a builder taught me to appraise myself of facts before deciding on a course of action in the creation of a new addition to the built environment. The quote “If you fail to plan, you are planning to fail”, which is attributed to Benjamin Franklin, became the mantra on the projects I was responsible for.

“Galileo's championing of heliocentrism and Copernicanism met with opposition from within the Catholic Church and from some astronomers. The matter was investigated by the Roman Inquisition in 1615, which concluded that heliocentrism was "foolish and absurd in philosophy, and formally heretical since it explicitly contradicts in many places the sense of Holy Scripture." *(Wikipedia – Galileo Galilei)*

My enquiries now lead me, in my opinion, to believe that it is the prospect of making significant profits from “green” investments, that is driving the push to impose wind farms and solar farms as the electricity generators of choice. This could be described as, “foolish and absurd in philosophy and formally heretical since it explicitly contradicts in many places the senses of reliability, affordability, availability and security of the generation and delivery of electricity in Australia”.

The cry from the “green evangelists” is that they believe, to prevent indeterminate “climate change”, the man-made production of carbon dioxide (CO2) must be curtailed. This, they further believe, will be achieved by including the phasing out of fossil fuels being used in the generation of electricity and replacing that generation with wind farms and solar farms.

This compilation of information from many sources, shows that this manic drive for the rolling out of “renewable energy”, is a case of:

Destroy the “environment” to save the “environment.”

Where to from here? There are many of us who will continue to communicate and educate wherever, whenever and however we can, that this push by the “green religion” to destroy Australia’s economy and the Australian way of life, must be resisted.

This, I believe, will be achieved by informing Australians about the environmental destruction now occurring and which will continue to occur, if not stopped by those entrusted to protect our environment.