Lithgow Environment Group, UWS Lithgow Campus, 30/3/2025

The Struggle for Humanity's Future

From the energy transition to a sustainability transition

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A Society in Transition

under Global, National & Local Threats

- Climate change
- Wages stagnating or declining in real terms
- Increasing gap between the rich and poor
- High probability of nuclear war
- Democracy and human rights undermined
- The market failing to meet human needs, e.g. housing becoming unaffordable

These threats are not sustainable!

'The Scream' by Edvard Munch

Existential Threat to Civilisation: Climate Change

Global heating in 2024 exceeded 1.5ºC above pre-industrial level.

Time is running out to avoid crossing tipping points

Existential Threat: Loss of Biodiversity and Ecosystem Integrity (and Beauty too)

Franklin River, Tasmania

Clear-felled forest before burning

We humans are totally dependent upon Natural Systems for our Survival

Illusion of human independence

Biosphere 2, Arizona USA

Reality:

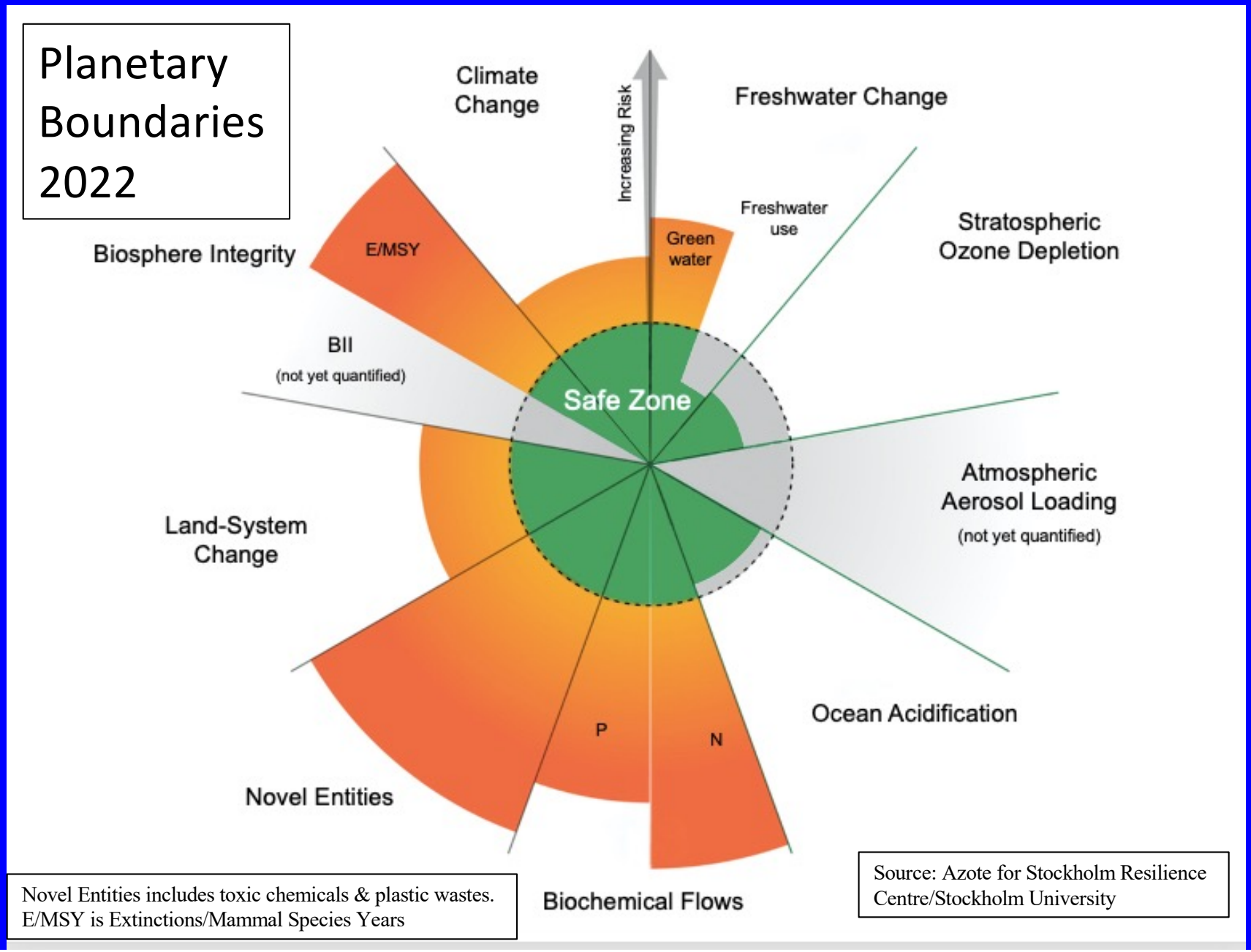
Human dependence

- Carbon cycle and hence climate
- Photosynthesis and related carbon & oxygen cycles
- Water cycle
- Phosphorus, nitrogen and sulphur cycles
- Bees and other pollinators
- Bacteria in our stomachs
- Mycorrhizal fungi

Yet human activity is damaging all of the above

Existential Threats to Civilisation: Environmental

Climate change is linked to several other existential environmental threats



Novel Entities includes toxic chemicals & plastic wastes.
E/MSY is Extinctions/Mammal Species Years

Source: Azote for Stockholm Resilience Centre/Stockholm University

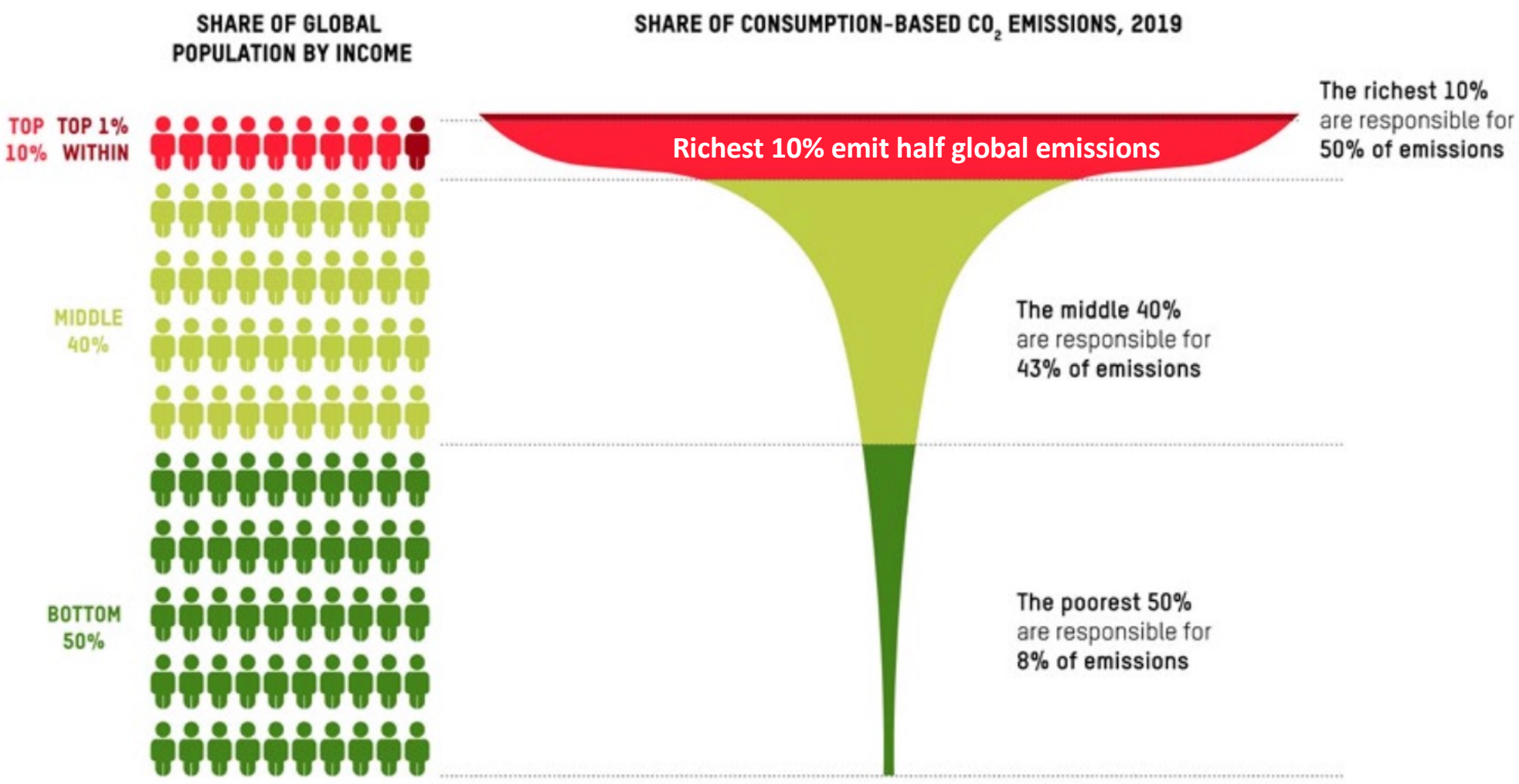
Threats to Society of Poverty & Social Inequality

Image by Peter Jung from Pixabay

The rich hold the wealth & income. The wider community must push governments to close the gaps within & between countries.

Share of Consumption-Based Global CO_2 Emissions, 2019

Source: Oxfam (2023)



Existential Threat to Civilisation: Nuclear War

Doomsday clock
In 2025, moved to
89 seconds to
midnight

Based on climate change and threat of nuclear war.

Current threats:

- USA Vs China;
- NATO Vs Russia;
- USA & Israel Vs Iran

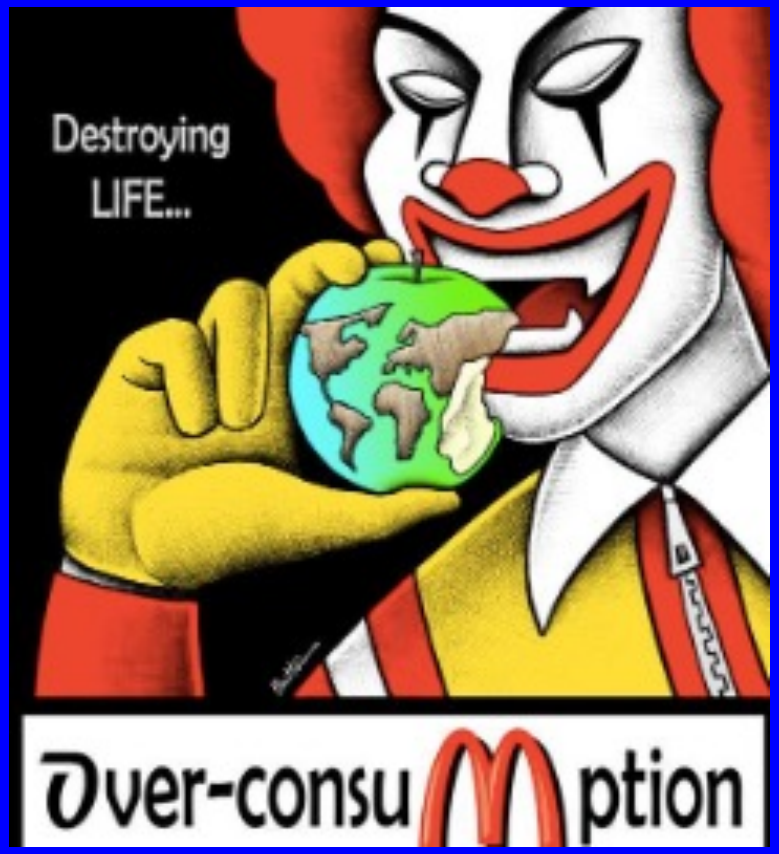
Australia would be involved & impacted

The image of the Doomsday Clock is reproduced with the permission of the Bulletin of the Atomic Scientists

Failure of the Dominant Economic System
which is based on myths

Myth: “Endless growth in consumption on a finite planet is feasible and desirable”

Refutation: Continuing economic growth of rich countries is destroying our life support system and failing to provide wellbeing for all



Failure of the Dominant Economic System
which is based on myths

Myth: "Major socioeconomic and political decisions should be left to the market"

Comment: This really means "left to the 1% who control the market"

This is neoliberalism, an extreme form of capitalism, that opposes democracy

Failure of the Dominant Economic System
which is based on myths

Myth: Wealth trickles down from the rich to the poor

Refutation: Survey of 18 OECD countries over 50 years, 1965–2015:

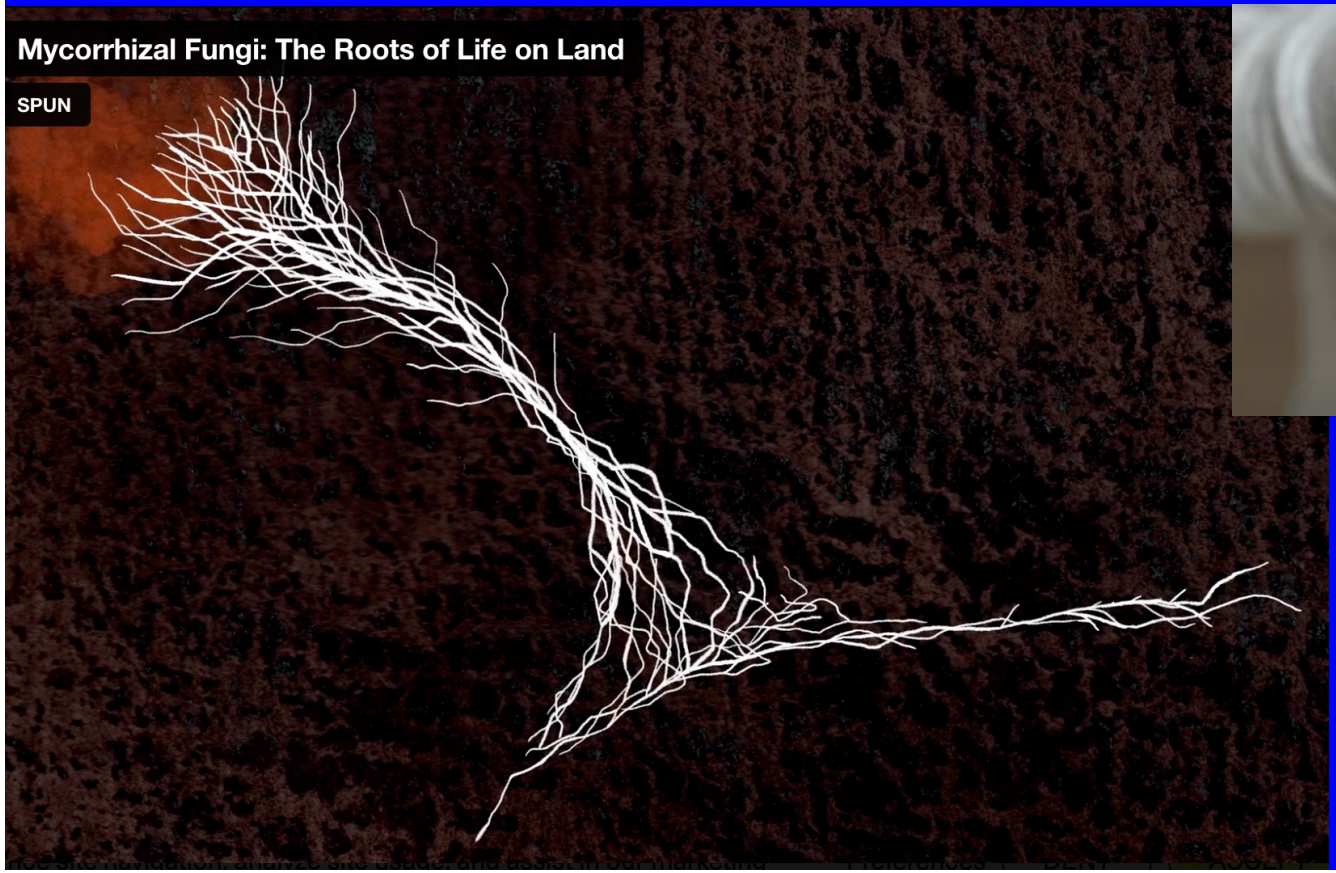
"tax cuts for the rich lead to higher income inequality in both the short- and medium-term. In contrast, such reforms do not have any significant effect on economic growth or unemployment."

Hope & Limberg (2022)

Failure of the Dominant Economic System
which is based on myths

Myth: The value of anything is determined by the market

Question: Are expensive chocolates more valuable to society than fungi?…than parenting? …than unpaid work?



We can choose Ecologically Sustainable Energy instead of Fossil Fuels

- Sustainable energy technologies are available and affordable
- But they are 'disruptive technologies' – hence the resistance & misinformation from vested interests

Sustainable energy = Reduction of wasteful demand (by energy efficiency & conservation) + Renewable energy

Lithgow is a Focus of the Energy Transition

Should nuclear replace the Mt Piper coal-fired power station? Do risks outweigh benefits?

What green industries could be created to provide long-term jobs in the Lithgow region?

Impacts of Fossil Fuels (FF), Coal, Oil & Gas

- Climate change from emissions of CO_2, methane & nitrous oxide
- Air pollution and respiratory diseases
- Water pollution and over-use
- Land degradation
- Energy insecurity: e.g. Europe's dependance on Russian fossil fuels; Australia held to ransom by fossil gas
- Fluctuating fuel prices

LA teenager's lungs

Open cut coal mine

How Renewable Energy can replace Fossil Fuels

Energy end-use 2024	Energy end-use	Future renewable energy contribution
Electricity **Australia NEM: coal 54.5%; RE 39%; fossil gas 5.3%** **(AEMO data, 12/2024)**		100% renewable electricity is technically & economically feasible in Australia & many other countries within 10–15 yrs.
Transport **Currently mostly oil**		Urban: electric public transport & elec. cars, cycling & walking; inter-city high-speed rail; air and sea travel need renewable liquid or gaseous fuels
Heat (non-electrical) **Currently mostly fossil gas**		Low temperature heating & cooling from direct solar & electric heat pumps; high temperature from renewable electricity

Electricity will play a greater role in heating and transportation

Recommended Energy Transition Strategy

Sustainable energy = renewables + electrification + efficiency + fairness

- Set targets for 5-year periods 2025-2050
- Rapidly replace fossil fuel (FF) electricity with renewable electricity (RElec)
- Replace petrol/diesel road vehicles with electric
- Replace FF in domestic & industrial heating with electricity
- Greatly increase energy efficiency of buildings, appliances & transport; foster behavior change too
- Social justice: assist disadvantaged workers and disadvantaged countries; rebuild local economies

First 6 actions will mitigate at least ¾ of Australia's GHG emissions; last action is challenging.

- To do: develop industry to produce renewable fuels, 'green' hydrogen and ammonia, for air & sea transport and non-energy industrial use

% Contributions of Renewable Electricity (RElec) in Selected Regions, 2022 or 2023

Region	RElec % of annual electricity generation
Regions with large hydro potential e.g. Norway, Iceland, Bhutan, Tasmania	About 100%
Regions with little hydro potential	
Denmark	88% net (100% expected by 2030); 67% variable
South Australia	74% net (100% expected by 2028)
Australia as a whole	38%
Scotland	62% of generation; 113% of electricity consumption; difference is exported
2 windy North German states	100%+ net each

Diversity of RE Sources and Siting


CST with thermal storage


Wind, Albany, WA

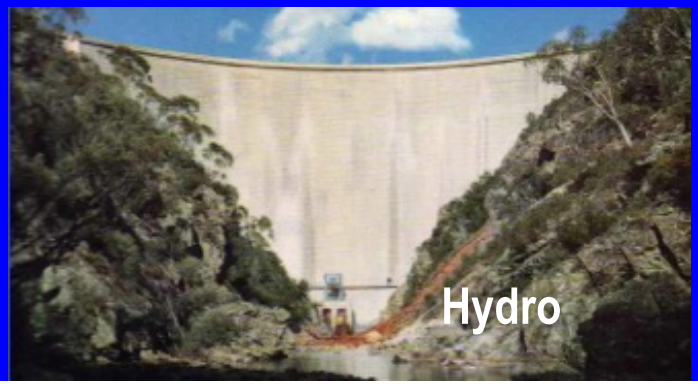
Wind
Biomass
Solar PV
Concentrated solar thermal (CST)
Hydro
Wave?
Tidal current?
Geothermal electricity?

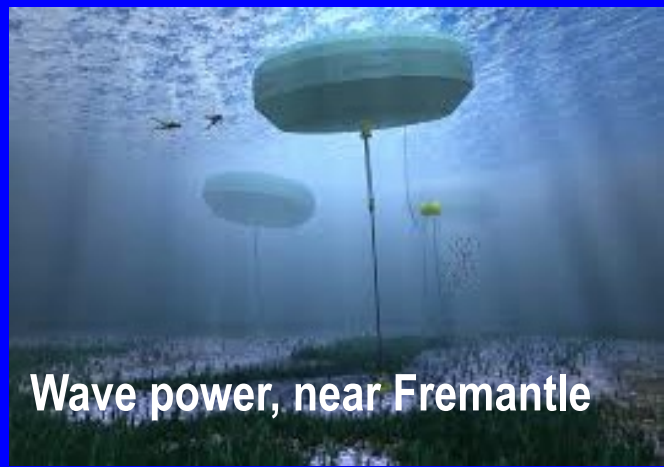
Australia has all except conventional geothermal


PV

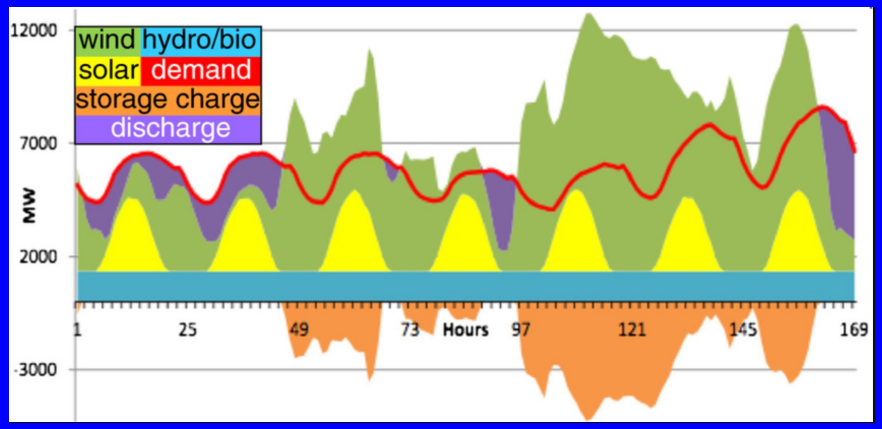

Geothermal


Bioenergy, Rocky Point, Qld


Hydro


Wave power, near Fremantle

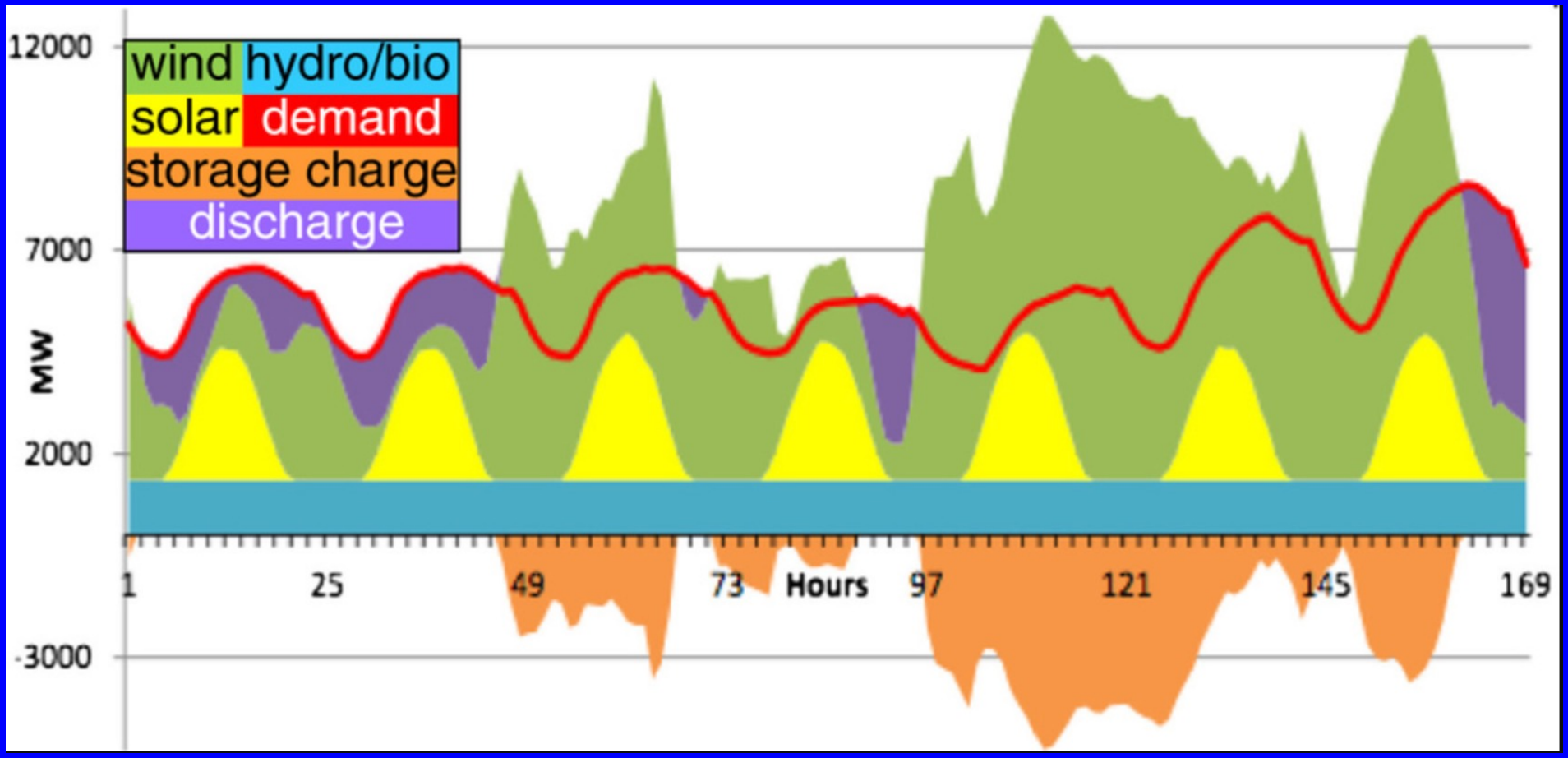
Managing Variability of Solar and Wind



- Storage
- Excess generation: Power-to-X, where X is green hydrogen & ammonia, other chemicals, industrial heat, water pumping, etc.
- Demand management (e.g. off-peak hot water; aluminium smelting)
- Transmission lines linking climate regions
- For rare periods of *Dunkelflaute* (dark doldrums), cheap gas turbines, burning either green fuels (biomass, hydrogen) or fossil gas or oil, are reliability insurance with a low premium

100% RElec Supply & Demand with Storage

One week shown



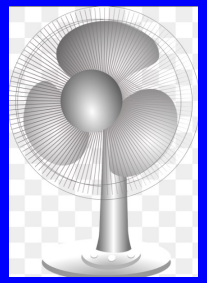
Refuting the Myth that Baseload Power Stations are Necessary

Baseload power stations operate 24/7 at rated power except during breakdown or maintenance. Coal (declining) in mainland Australia except SA; nuclear in France

- South Australia generates 74% of electricity from variable renewables. Its grid is operating reliably with no baseload power stations
- Denmark with 88% renewable electricity has no nuclear and is phasing out baseload coal, already down to 8% of generation, zero by 2030
- Computer simulations of electricity systems with 100% renewables from Australia and around the world find reliability without baseload
- Rare periods of *Dunkelflaute* (dark doldrums) can be supplied as discussed in a previous slide.

Energy Efficiency saves Energy and Money

Renter



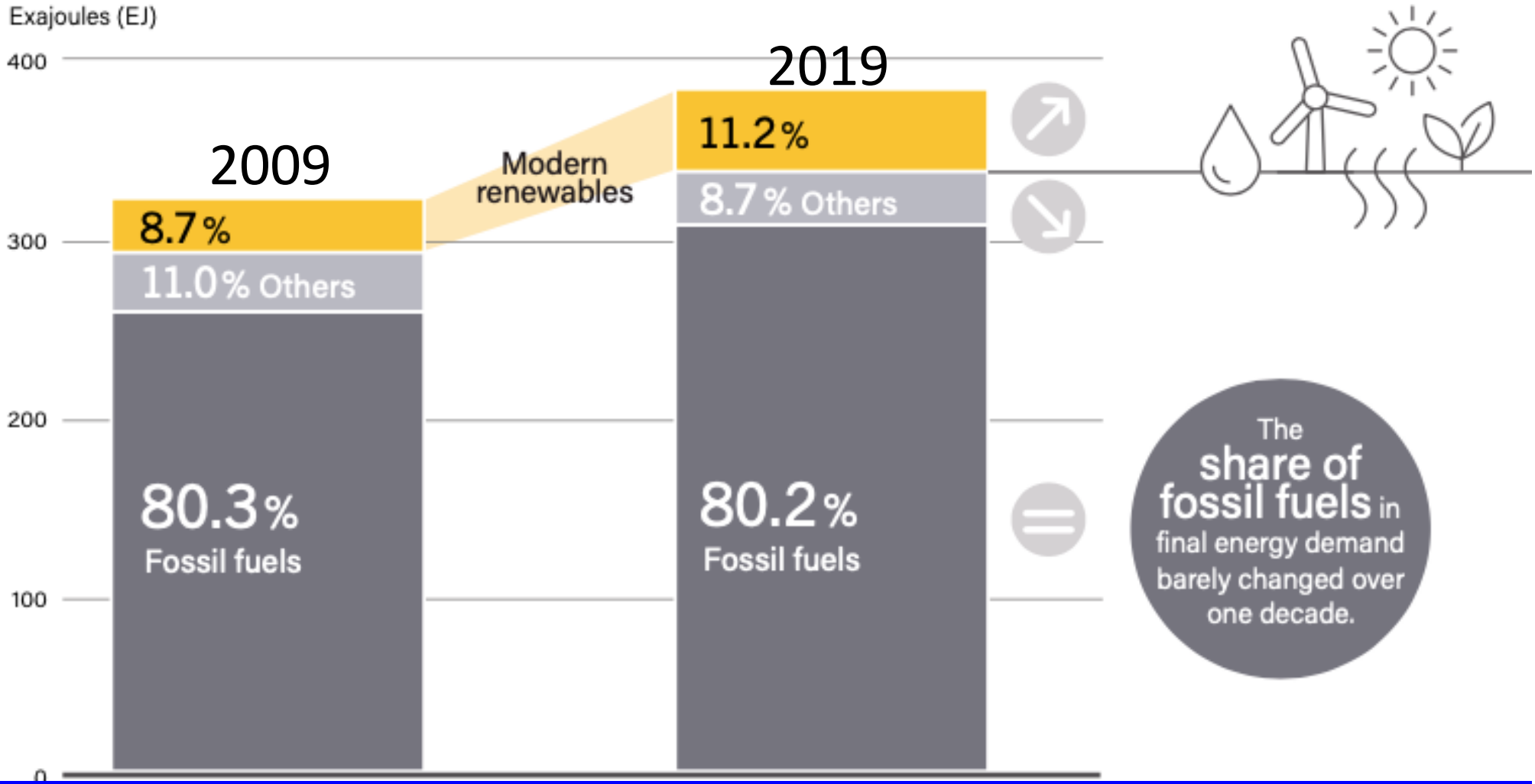
Key Policies

- Energy ratings with mandatory disclosure upon sale and lease of buildings; incentives for landlords
- Energy labelling and performance standards for appliances and equipment

Home-owner

Growth in Global Total Final Energy Consumption, Electricity + Transport + Heating, 2009 to 2019

Source: REN21 (2021), Fig. 2, based on IEA data



Growth in consumption → renewable energy is chasing a retreating target

Vested Interests are spreading false & misleading Myths about Renewable Electricity (RElec)

- ✶ Myth: "Base-load power stations, either coal or nuclear, are necessary, and RElec cannot provide them". (Refuted above)
- ✶ Myth: "RElec is too variable and unreliable to make the predominant contribution to grid electricity supply"
- ✶ Myth: "RElec needs more energy inputs to build than it generates over its lifetime"
- ✶ Myth: "RElec will always need fossil fuels for mining the raw materials, minerals processing and manufacturing"
- ✶ Myth: "RElec is too diffuse to run an industrial society; there is insufficient land for RElec and food production"

Refutations of these and other myths on markdiesendorf.com

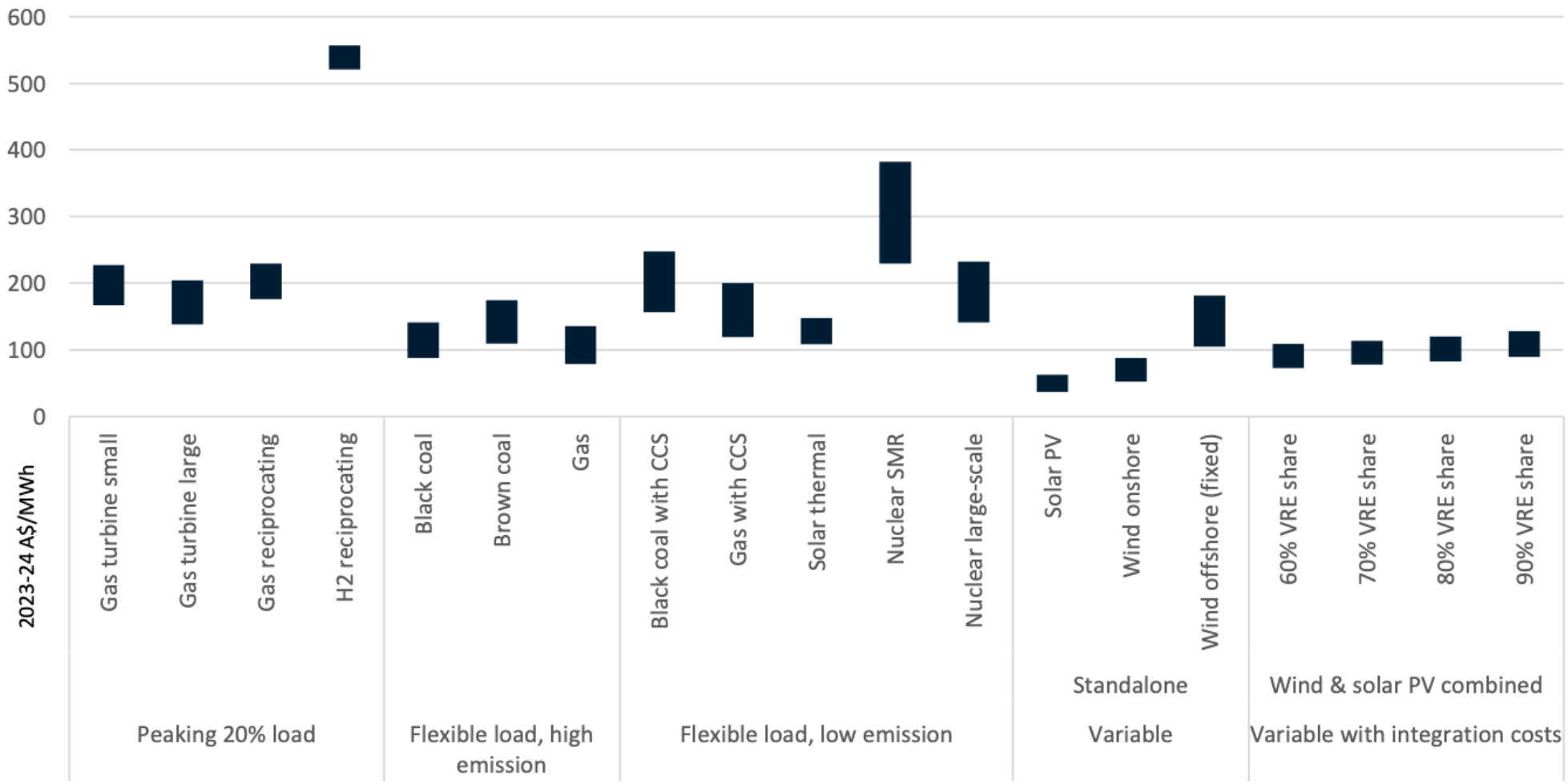
The Myth of big Use of Land by Wind & Solar

Agrivoltaics

Wind spans large area but occupies small

Any questions so far?

CSIRO GenCost results for electricity generation in 2030*



*Nuclear is hypothetical as it could not be operating by 2030.

Hazards of Nuclear Energy

- Proliferation of nuclear weapons assisted & cloaked by the 'peaceful' nuclear industry:
  UK, France, India, Pakistan, North Korea, South Africa

- Disastrous accidents:
  - Kyshtym, USSR, 1957
  - Three Mile Island, USA, 1979
  - Chernobyl, Ukraine, 1986
  - Fukushima, Japan, 2011

- High-level nuclear wastes: no operating final repository
  Finland will be first; very little waste is reprocessed (Irwin incorrect)

In addition to the big three hazards:

- Low level radiation from normal operation of nuclear plants

Childhood Cancers near Nukes in Germany

Kaatsch et al. (2007); Spix et al. (2007); Fairlie (2009)

- Case-control study commissioned by the German Federal Office for Radiation Protection
- Considered *all* cancers in children aged < 5 near *all* major nuclear power stations in W. Germany, 1980–2003
- The best study of this issue in the world
- Results: 2.2X leukemias and 1.6X solid cancers within 5 km of a reactor, compared with children living further out
- Cancer increase declined as residential distance increased beyond 5 km
- Results are statistically significant
- Cancers likely due to prenatal exposure to radioisotopes emitted by the nuclear reactors

Wallerawang & several small communities are about 5 km from Mt Piper site

Summary: Why Nuclear is a Bad Idea

- Nuclear is too expensive, too dangerous, too slow to plan and build, and too inflexible in operation to be a suitable partner for renewables
- It is also very unreliable at times, as demonstrated by the impact of the 2011 tsunami and by heatwaves in France
- Is the Coalition's nuclear proposal designed to frighten potential investors in renewables, even if nuclear never eventuates?

Kamisu Wind Farm 300 km from earthquake epicenter by Wind Power Ibaraki

Major Barrier to a Better World:
State Capture by Vested Interests

- Capture of the nation-state – government, opposition, public service, media, other institutions – by powerful vested interests
- E.g. fossil fuel, armaments, finance, property, pharmaceutical and gambling industries
- Captors can also be foreign governments or the military-industrial complex that rules those governments

Capture of the Australian Nation-State by Fossil Fuel Industry

- Retiring Ministers for Energy/Resources of both major political parties appointed to highly-paid jobs in fossil fuel industry
- Both the Chief of Staff and a senior political adviser to previous Prime Minister appointed from Minerals Council of Australia
- Huge donations to both major parties from fossil fuel industry
- Campaigns by News Corp against climate science and renewable energy

Note: I do not question the motives of the people involved.

Capture of the Australian Nation-State by the Global Military-Industrial Complex

- Australian Strategic Policy Institute is funded by US & Australian governments and the weapons industry
- Former Defence Minister appointed president of a major contractor to Defence
- Before Australian government joined AUKUS and announced it would buy nuclear submarines, 5 ‘retired’ US admirals were paid consultants to Defence
- Expansion of US bases under Force Posture Agreement – land, sea and air – including access for nuclear weapons-capable B-52s based in Australia

Conclusion: Australia’s Foreign Affairs and Defence strategies have been captured by the US military-industrial complex

Media Bias

s

The Sydney Morning Herald

January 15, 2020

James Murdoch breaks ranks over 'climate change denial'

Washington: James Murdoch has accused his family's global media empire of promoting climate denialism in a stunning attack on News Corporation's climate coverage.

earch · The Guardian · Australia edition

10 January 2020

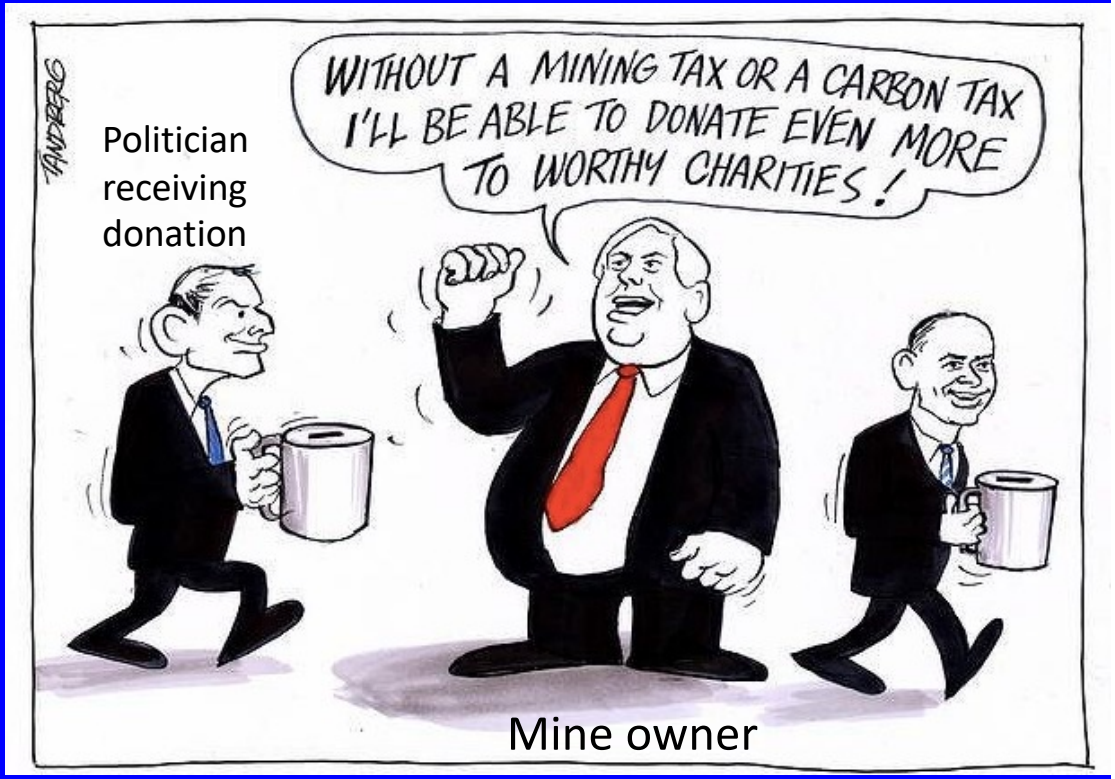
News Corp employee lashes climate 'misinformation' in bushfire coverage with blistering email

Emily Townsend's reply-all email to executive chairman calls the company's coverage 'irresponsible' and 'dangerous'

A senior News Corp employee has accused the company of "misinformation" and diverting attention from climate change during the bushfire crisis in an explosive all-staff email addressed to executive chairman Michael Miller.

State Capture: Methods

- Political donations & election expenditure
- Revolving door jobs
- Concentrated media ownership
- Social media campaigns
- Think tanks (e.g. IPA; ASPI)
- Covert lobbying
- Loans by foreign governments & international agencies
- Trade dependence



Problem: To reduce political donations to, and election expenditure by, candidates while not excluding new Independents.

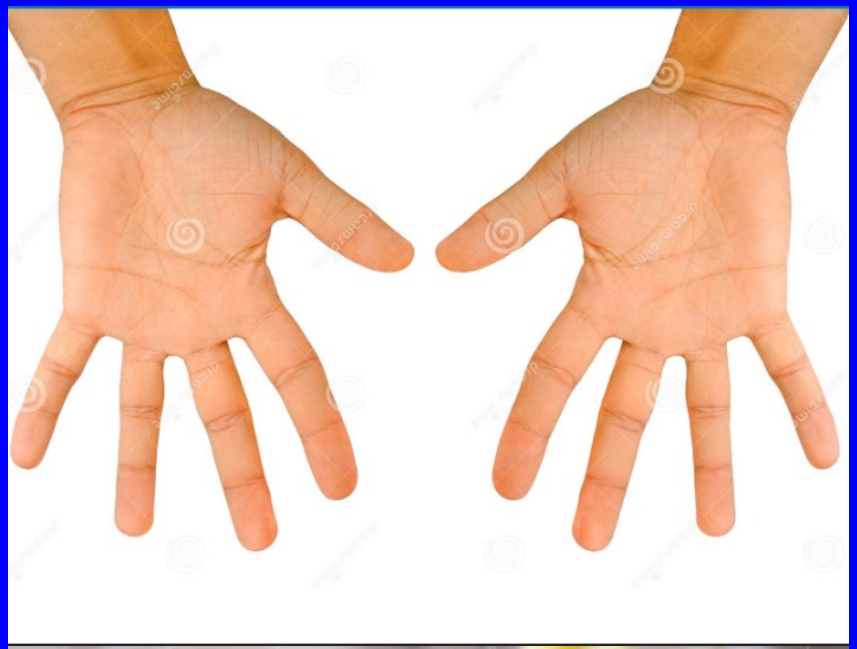
Most resistance to the energy transition is from fossil fuel industries that influence climate policies with donations to politicians

The Threats to Environment, Social Inequality, Peace and Democracy are Connected

- Rich people and rich countries have the biggest environmental impacts
- Environmental impacts are worse for the poor (e.g. droughts; floods)
- A common driving force is the dominant economic system, which is based on the exploitation of the planet and its people
- The global economy is undemocratic, ruled by rich people, large corporations & rich countries
- War has huge environmental, social justice and political impacts
- War and subversion are a tool of colonialism & neocolonialism
- Better democracy ➔ less social inequality and injustice and fewer wars

What strategies could be brought to bear on all threats simultaneously? First identify the common driving forces

Trying to kill 10 flies simultaneously with 10 fingers



The Need for a Stronger Social Change Movement

- Form alliances of environmental, public health, social justice, trade union and peace organizations to pressure governments to address the driving forces of common to all these issues

- The driving forces are state capture by vested interests and the dominant economic system

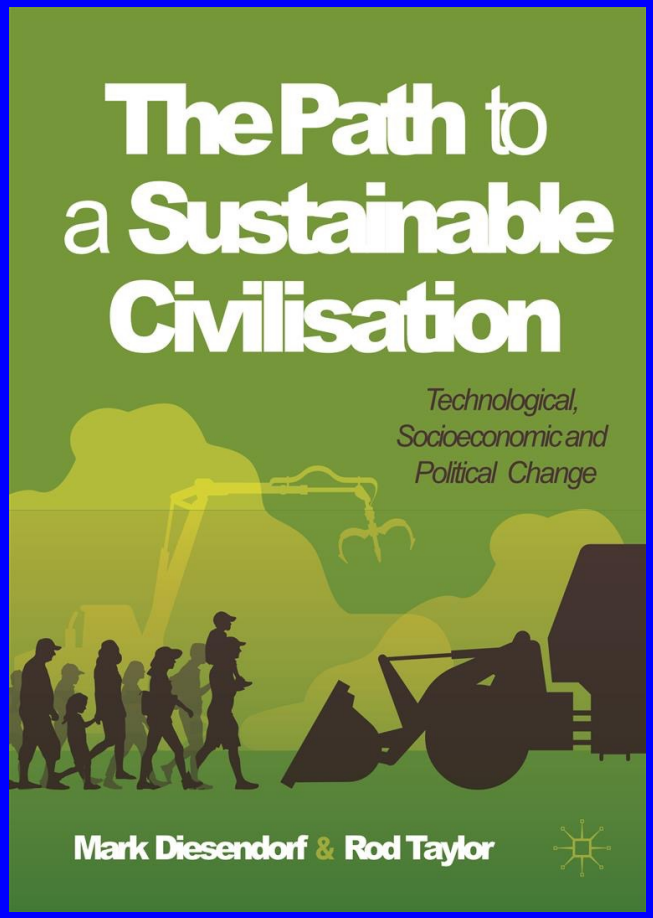
Government Policies Needed

- Weaken the methods of state capture
  - Control political donations without disadvantaging Independents; revolving door jobs; concentrated media ownership; etc.
- Green the economy
  - Climate; energy, environment; wellbeing indicators;
- Strengthen social justice 1: universal basic services
  - Public housing, health, education, transport & parks; free childcare & aged care; wellbeing indicators replace GDP
- Strengthen social justice 2: job guarantee
  - Funded by federal government; jobs from local gov't & registered community organisations
- Reduce military expenditure & redirect to defensive defence
  - Cancel AUKUS subs; sell tanks; expand aerial and underwater drones

Suggested First Steps for Humanising Economics

- Introduce a wide range of measures of wellbeing, relegating GDP to a minor role
- Expand Universal Basic Services (UBS): public health, education, transport, parks, libraries
- Introduce a job guarantee (JG) for all who want to work; jobs provided by local government and registered community organisations, and funded by federal government
- Fund UBS and JG by money creation, without driving inflation, by expanding national economic capacity – labour; skills; materials; energy; infrastructure; institutions – using insights from Modern Monetary Theory.

Further Information



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Article just published
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