# POLICY AND SOME ECONOMICS FOR THE NET ZERO ENERGY TRANSITION

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# The transition can happen faster than anticipated

*10-20 years ago 'we' thought:*

…Coal cheapest forever… EVs 2040s… dev'ing countries replicate fossil led development

… 2 degrees illusory, aim for 3 degrees, fear 5 degrees

*Now*:

PV cheapest energy

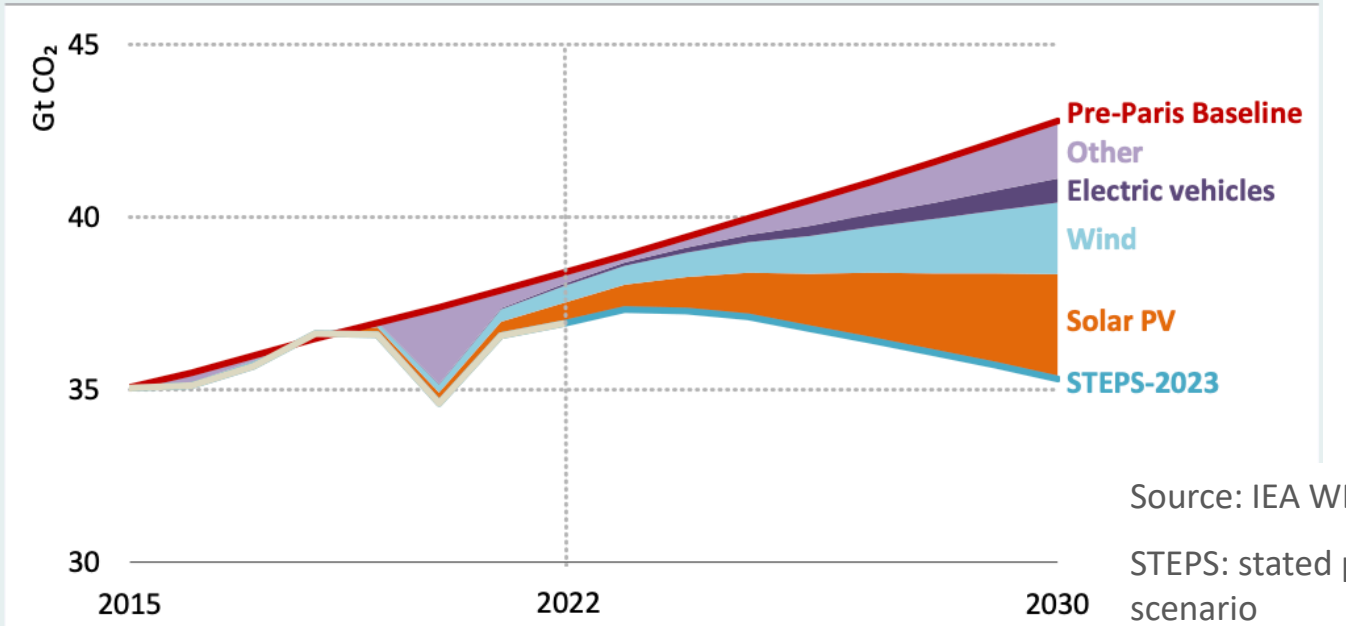
Peak CO2 2020s expected

2d possibly in reach

*Challenge:*

Making deep transition happen

**Figure 1.15** ▷ Global energy sector $CO_2$ emissions in the pre-Paris Baseline Scenario and the STEPS, 2015-2030




Source: IEA WEO 2023

STEPS: stated policies scenario

# A carbon price on all fossil fuels produced (and imported/exported)?

Comprehensive upstream carbon price would be simple and effective

Politically impossible domestically (at this time)

Export carbon price (on coal and gas):

at ‘high’ CO2 prices would make much of fossil fuel exports uncompetitive (unless other exporters did likewise)

… implement at low carbon price levels

… recycle to support structural adjustment

# Do we still need policy to support renewables?

- Solar, wind the cheapest new built electricity generation

+ Coal fired generators closing quickly

+ Emissions reductions targets depend on fast power decarbonisation

+ Future NEM market returns highly uncertain (avg spot market prices low&falling for RE)

| | Avg NEM value 2023 | Avg NEM value 2018 |
|---|---|---|
| Coal (black) | $105/MWh | $79 |
| Wind | $55 | $77 |
| Solar (utility) | $41 | $80 |

Data: AEMO via OpenNEM

# How to support renewables?

| Certificates trading (Renewable Energy Target) | Underwriting Mechanisms (CIS, LTESA) |
|---|---|
| RE certificates produced by generators and purchased by distributors | Government guarantees minimum price/revenue<br>(also maximum price/revenue with returns to government) |
| Market based – private industry determines investments | Government can steer investment – through tailored tenders (place, technology, timing) |
| Same subsidy to all generators<br>"high" subsidy based on cost of marginal generator | Subsidy element varies by project<br>Likely lower overall subsidy element |
| Future price risk borne by generators and consumers<br>→ Higher finance costs | Future price risk borne by government<br>→ positive political economy<br>→ Lower finance costs<br>→ Budget contingent liability; counter-cyclical to energy prices |
| **Key benefits: Market solution**<br>**Key worries: Higher power prices** | **Key benefit: govt can steer, lower power prices** (electrification, political economy)<br>**Key worries: 'central planning', budget impost** |

# Desirable elements for the Capacity Investment Scheme

Market decisions where possible, government decisions where necessary

Harmonization with State electricity policies

Transparency: clarity about objectives and procedures

Predictability: longer-term roadmaps

Strong analytical basis in government

Quick start

**Longer term:** government underwriting of generation forever? Or only through transition? Market reform?

# A carbon price in electricity?

Arguments against

… Carbon price in electricity raises electricity prices

… and doesn't directly address hurdles to RE investment

But a carbon price in electricity would

… Avoid distortions viz-a-viz industrial energy use (Safeguard Mechanism)

… CO2 incentives for time-of-day electricity use … esp for storage, mg'able loads

… Help reflect carbon objective in system planning

# Transport

Fleet fuel efficiency standard: price incentives towards EVs and more efficient ICEs

EV rise brings need for road tax reform: road use charges, plus fuel/emissions taxes

EV grid integration: VTG, ToU pricing for all charging

Taxing fuel use in heavy transport, agriculture, aviation

SAF mandate

# Industry

Safeguard Mechanism creates a price signal in industry

… incl to drive electrification, energy efficiency, process change

Price level limited by access to ACCUs and capped below costs of CCS and some other options

Concerns about gradually rising effective carbon cost differentials with imported commodities – CBAM consideration

# Supporting clean energy export industries

Australia's comparative advantage and huge market opportunities

– esp green iron, green ammonia/fuels, …

R&D – incl applied research eg CRCs

Financing and government equity stakes – eg CEFC; NRF?

Facilitation – planning, permitting, indigenous interests, labour force

# Supporting clean energy export industries

Industry policy - competing with the US IRA subsidies?

Caution:

… supplying into export markets (with depressed prices) does not benefit domestic consumers

… opportunities to build downstream manufacturing limited compared to eg USA, EU, China

… geostrategic objectives are separate

## ‘Think big’: PM plans cash splash on green fund

**Phillip Coorey** *Political editor*

Feb 15, 2024 – 10.30pm

The Albanese government is planning a “think big” multibillion-dollar initiative to try to compete with the United States’ $624 billion Inflation Reduction Act and similar schemes elsewhere, in a bid to drive the domestic development of clean energy technology.

In a speech to be delivered in Newcastle on Friday evening, Prime Minister Anthony Albanese will argue that if Australia is to become a renewable energy superpower, “the government has to be a partner in this, not just an observer”.

# Fiscal aspects of (support for) energy export industries

Large green energy/resources industries for export:

… Benefits for global decarbonisation

… local costs, eg environmental, cultural, resource competition

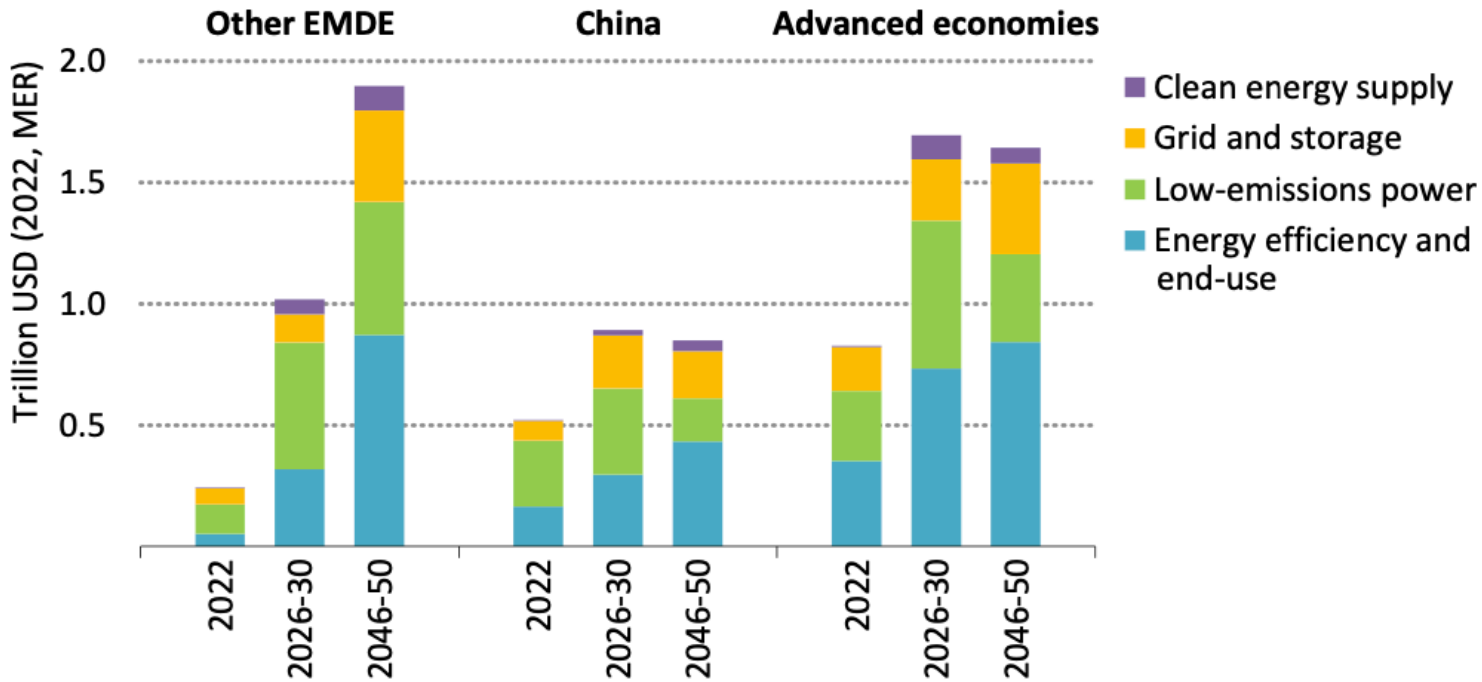
Green industry policy needs to yield appropriate benefits for Australia

… fair tax arrangements (not like gas)

… subsidies must, on average, be amply repaid through future taxes/dividends

# Global investment ramp-up needed for net-zero

**Figure 1.18 ▷ Average annual clean energy investment needs by region/country in the NZE Scenario, 2022-2050**




Source: IEA WEO 2023

## Future global annual net-zero investment

Investment now, with benefits later: clean, low operating costs

Clean energy: ~$4tr/yr clean

… up from ~$2.5tr/yr for total energy now

*Plus* transport, buildings, industry, mining…

Extra annual investment for net zero perhaps ~~$3tr/yr+, to ~2050

## Comparison: current global annual …

*GDP:* $105tr (MER; $175tr PPP)

*Gross capital formation, share of GDP:*

World 27% ($28tr); OECD 23%, non-OECD 32%

*Public expenditure:*

*Military:* 2.3% ($2.4tr) *Public education*: 4% ($4.2tr)

# Where could this net zero investment come from?

| | |
|---|---|
| Higher GDP | … how? |
| Less other capital investment | … what to cut? |
| Less household consumption | … economically and socially/ethically justified |

Household consumption ~60% of GDP → 3% for net zero transition means 1/20 less household expenditure

Best thought of deferred consumption: investment now will yield future productivity benefits

Instruments: Taxation changes, higher compulsory superannuation

# What do we owe the future?
# Investment push as an inter-generational bargain

Present generation, having benefited from the fruits of existing high carbon system, curtails some consumption

… to create the low-cost, high-productivity clean energy system of the future

… benefiting future generations who will suffer more from climate change impacts

AI generated image. Prompt: “An older man, probably an engineer, standing in front of a coal fired power station, shakes the hand of a teenager. Both look pensive but hopeful. Style: 1960s.” gencraft.com

# Thank you

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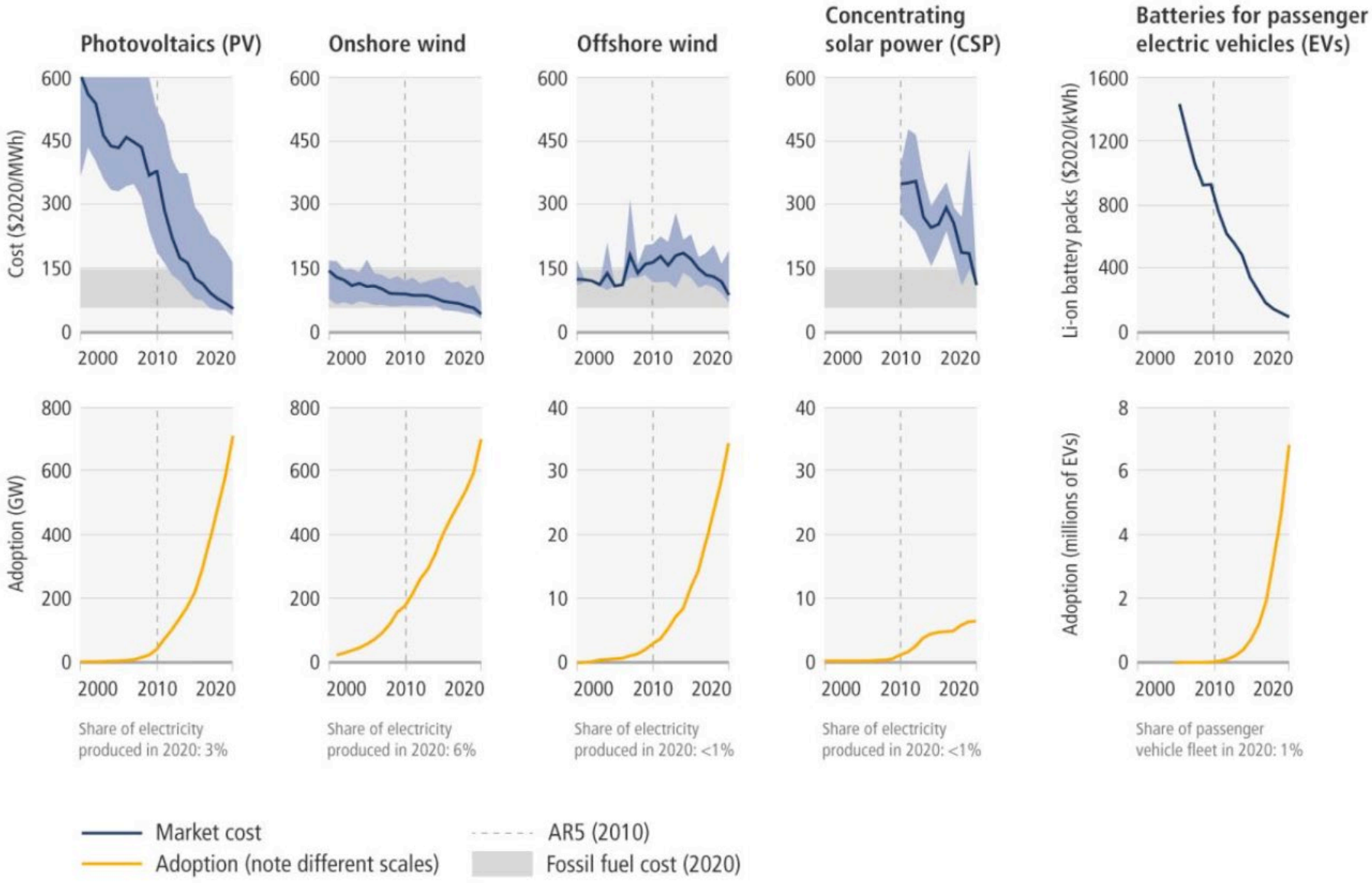
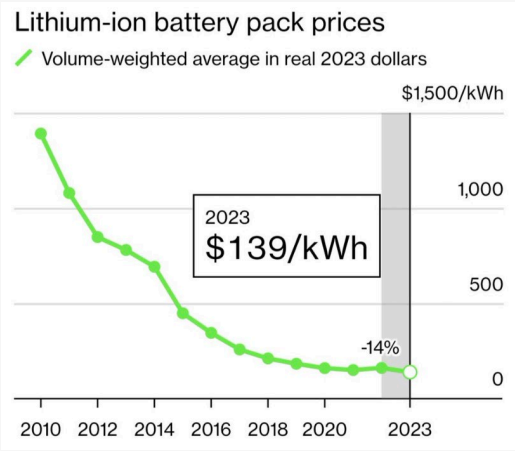
# The unit costs of some forms of renewable energy and of batteries for passenger EVs have fallen, and their use continues to rise.




Solar PV

Typical module price now US$0.16/W

Global new build 2023 ~400 GW

2023 ~ +50%

# Energy networks

Electricity: trend towards decentralized energy resources

… more resilient systems

… lower network costs

… VTG decentralization opportunity

→ Create comprehensive incentives for efficient integration

Gas: trend towards smaller (or no) distribution networks

… spiral could go fast in residential gas networks

… networks private owners' interests diverge from public interests

→ Regulation or public ownership

# CO2 removal as an energy issue

Net-zero: remaining CO2 emissions = CO2 removal

CDR not just biological but technological – magnitude, land competition, relative cost

Australia has comparative advantage for technological CDR

… direct air capture, enhanced silicate weathering

… potentially very large industry, similar characteristic with green H2/iron

… but will someone pay?