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The Global Alliance for Sustainable Coal

FutureCoal submission to the Select Committee on Information Integrity on Climate Change and Energy 11 September 2025

Select Committee on Information Integrity on Climate Change and Energy
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Introduction

FutureCoal's submission to the Senate's Terms of Reference for the "Information Integrity on Climate Change and Energy" inquiry underscores the vital role of independent data verification, insisting on transparency in energy modelling and consistency in emissions reporting to ensure that public dialogue is both informed and accountable.

Global and national energy models often present themselves as roadmaps demonstrating that achieving and affording carbon neutrality is possible. However, these scenarios are based on a series of optimistic assumptions that distort reality. They assume steady and uninterrupted decreases in renewable and battery costs, while minimising the challenges of balancing variable supply with storage, transmission, and backup capacity. They depend on the indefinite continuation of subsidies and policy measures that are politically and fiscally unsustainable on a large scale. They expect quick consumer adoption of new technologies and overlook material, supply chain, and geopolitical risks. Importantly, these models are constructed backwards from the target, with inputs manipulated to make net zero seem inevitable rather than conditional. The outcome is a false impression of low-cost transition routes that can mislead policymakers, investors, and the public into believing that ambition alone will achieve results, when in fact the path is far more difficult, expensive, and risky.

The debate over the future of coal is often shaped by simplified cost comparisons, particularly the use of the Levelized Cost of Energy (LCOE). While LCOE offers a standardised measure of generation costs, it is an incomplete and frequently misleading tool when used to compare coal with renewables. Although renewable energy generation costs (LCOE) have decreased significantly, this widely employed metric omits key system-level costs, underestimates resilience and balancing requirements, and ignores strategic factors such as assets that are already amortised. A more balanced analysis should incorporate integration costs, realistic assumptions, and the differing economics of legacy versus new energy assets. It fails to consider system integration costs, assumes uniform technological progress, and does not account for the economics of existing assets relative to new ones.

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This paper explores these misconceptions and highlights coal's continued importance as a strategic asset in energy security, affordability, and system resilience.

The Limitations of the most common metric for comparing costs - LCOE

The *Levelized Cost of Energy* (LCOE) is often used as the benchmark for comparing power generation technologies. By definition, LCOE calculates the average total cost per unit of electricity produced over the lifetime of a plant. It provides a convenient and standardised metric, but it oversimplifies a far more complex reality.

First, LCOE assumes every unit of electricity is identical. In practice, the value of power depends heavily on *when* and *how* it is produced. A megawatt-hour generated at night during peak demand has a very different economic value from one generated at noon on a sunny day, when solar supply is abundant and prices are suppressed.

Secondly, LCOE omits essential system-wide costs. These encompass expenses for balancing supply and demand, backup generation, storage, and transmission upgrades. As renewable penetration increases, these integration costs grow significantly. The International Energy Agency (IEA) and the OECD Nuclear Energy Agency (NEA) have shown that at high levels of variable renewable energy (VRE), integration costs can match or even surpass the LCOE of the generating technology itself (IEA, *The Power of Transformation* 2014; NEA, *System Costs of Electricity* 2024).

Third, a growing disconnect exists between declining LCOEs and consumer bills. While renewable LCOEs have plummeted significantly over the past decade, household and industrial electricity prices have not followed the same pattern. In fact, in many markets, they have increased. This reveals the hidden costs of infrastructure upgrades, balancing needs, and system services that LCOE does not account for (IEA, *World Energy Outlook* 2023).

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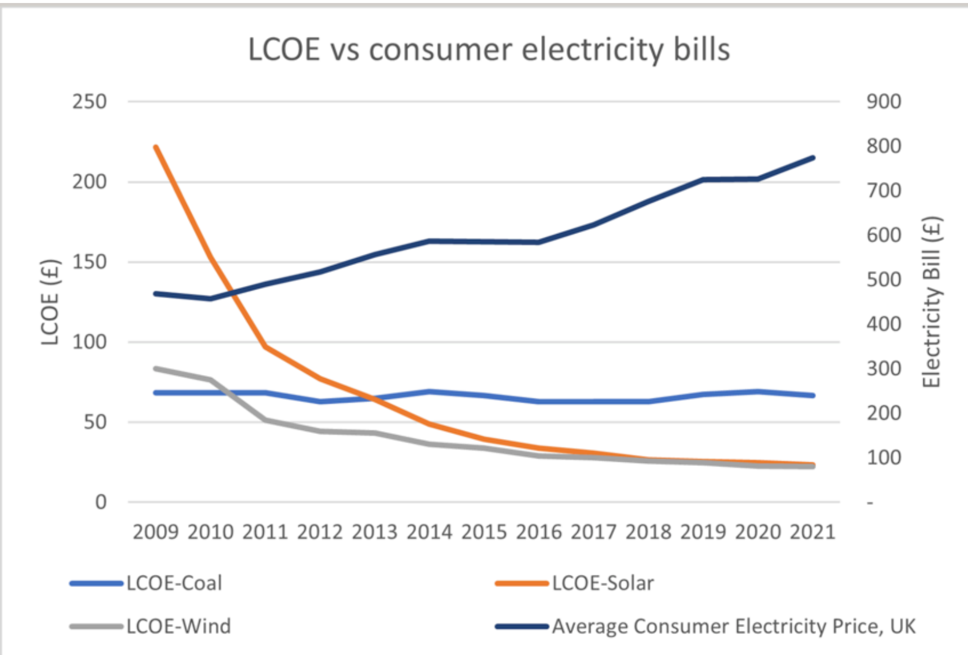

Figure 1 https://enodatech.com/news-insight/the-hidden-costs-of-delivered-renewable-energy

Summary

In brief, LCOE is a helpful but incomplete measure. It does not reflect the true costs of providing reliable electricity to consumers and overlooks the difficulties of maintaining resilience in high-renewable systems. A more comprehensive analysis—covering integration costs, consumer impacts, and system stability—is vital for effective policy-making and investment choices.

Current energy discourse compares apples with oranges

Many coal plants are already fully amortised. Their capital costs are sunk, leaving only fuel, operation, and maintenance expenses. Of the 2140 GW of plants operating, 745 GW are 20 years or older and are likely to be mostly free of the debt for initial construction. This makes them far cheaper to operate than building entirely new capacity. Every new solar or wind project must recover high initial capital costs, land, connections—often supported by subsidies or guaranteed offtake agreements due to the low-capacity factors, especially for solar. Unlike coal or gas plants, their lifespan is less than half. In fact, most turbines and panels built today may require a complete replacement or overhaul, whereas a fossil fuel plant is still in the early stages of its useful life. When this is considered, the true cost of renewables is often two to three times higher than the headline figures suggest. Because of low utilisation rates, replacing 1 GW of coal or gas requires 3–5 GW of wind or solar capacity to deliver the same output at best, not including battery storage. Pro-renewable arguments frequently omit this, relying on LCOE comparisons that ignore real system costs. Even the UK Climate Change Committee, an influential political assembly, still regard LCOE as the accepted norm.

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Comparing new renewable projects to upgrading and decarbonising existing coal assets (rather than building new greenfield coal plants) would foster a more meaningful policy debate. For electricity consumers, what matters is not the cost of new builds but the marginal cost of power from plants already in operation. Consideration of these scenarios is often overlooked. There are over 1,030 GW of coal plants worldwide where technology upgrades or retrofitting with carbon capture equipment have yet to be explored to accelerate the decarbonization of the energy sector (excluding steel and cement plants).

It is worth recognising that the cost of decarbonising existing fossil-fuel assets can also be compared with new renewable projects as an additional benchmark. This enables a more meaningful evaluation of decarbonising energy systems, where retrofitting and upgrading an existing coal plant (a brownfield project) versus building a new renewable plant (a greenfield project) to produce the same megawatt-hours presents another viable option.

A joint study with the ASEAN Centre for Energy (ACE) highlights this point. It found that investing USD 26 billion in clean coal technology across ASEAN, which involves upgrading subcritical plants to ultra-supercritical technology, would cut annual emissions by 60 million tonnes of CO_2 while providing reliable baseload power. In comparison, the same investment in offshore wind would displace only 7 GW of subcritical coal capacity, reducing emissions by just 35.8 million tonnes and still requiring subcritical plants to operate for reliability (see Figure 2). This example shows why selective comparisons can distort the debate and why technology-neutral investment assessments are crucial.

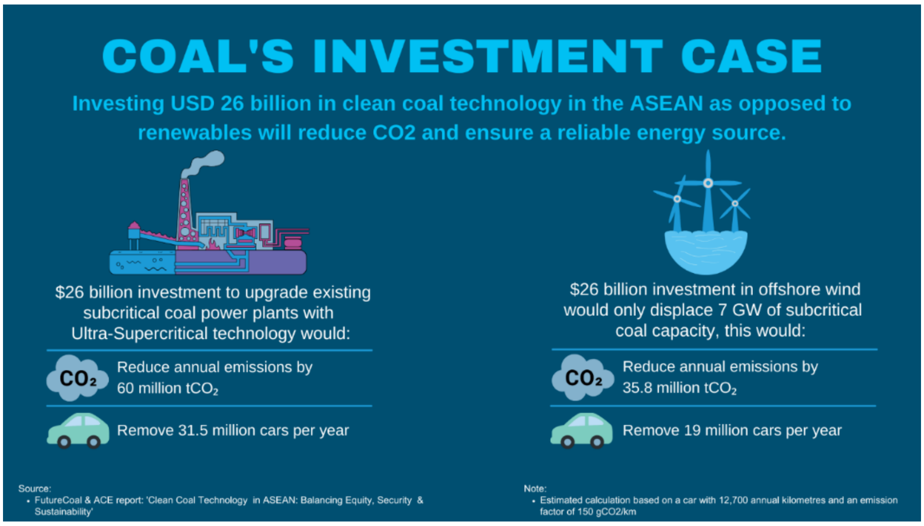

Figure 2 Joint report between FutureCoal and ASEAN Centre for Energy (ACE): "Clean coal technologies in the ASEAN": https://mcusercontent.com/c35475364a541a1bdee7dc50b/files/41eab407-db3a-900c-6656-f47dd2cec035/WCA_ACE_Clean_Coal_Technology_in_ASEAN_Report.pdf

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Rethinking "Stranded Assets": Could an Electrified Industry Be the Real Risk?

Fossil fuels were first branded as a *stranded-asset risk* in the 2000s by NGOs and academics. It remains a label today. Yet policymakers and investors overlook a parallel—and arguably more immediate—danger: the risk of *stranded industries*.

As governments promote capital-intensive sectors such as steel, cement, aluminium, and data centres to rapidly electrify, these industries are becoming increasingly vulnerable to persistently high and volatile electricity prices. The significant policy shift towards electrifying vehicles and household heating worsens this situation. In markets that rely heavily on variable renewables, without adequate firm capacity, long-duration storage, or a resilient grid infrastructure, electricity not only becomes expensive but also an unreliable service meant to perform a crucial societal function.

This creates a paradox: instead of achieving "green competitiveness," industries risk losing their global edge. Facilities could become uneconomic to operate, investment might migrate to jurisdictions with cheaper and more secure energy, and economies that once prided themselves on industrial strength may find themselves hollowed out. The real stranded-asset risk is therefore not limited to coal plants—it extends to the very industries meant to drive economic growth and energy transition. Unless power systems are built on a foundation of resilience and firm supply, electrification risks becoming a trap rather than a solution.

Furthermore, within the energy discourse, the contradiction in advocating for the phase-out of coal and its replacement with renewables, which will require critical minerals, steel, and cement, necessitates raw materials that must all be mined under the strictest environmental, social, and governance (ESG) standards. The current narrative clearly lacks discussion or emphasis on the realities of mine development, as highlighted by the experts FutureCoal has consulted. The expectation from commentators for a rapid move towards a coal-free energy transition does not acknowledge that developing mines with a zero-compromise approach, adhering to strong ESG standards, can take 15 to 20 years, and this is before the materials are refined and transformed into high-value components for energy equipment.

A summary of what the current narrative commonly omits

LCOE ≠ bills. Levelized Cost of Energy compares new-build generation but omits system costs (balancing, storage, transmission, inertia provision), which grow with higher VRE shares. OECD-NEA's 2024 system-cost work and IEA analyses underscore that planning on LCOE alone underestimates total costs borne by consumers and industry. Nuclear Energy Agency (NEA)+1

New vs. existing assets. New solar/wind are often compared against fully amortised coal. For tariff impacts and competitiveness, the relevant comparator is the marginal operating cost of existing units, not the LCOE of a hypothetical replacement. EIA's operating-expense series shows 2023 fossil-steam (coal) operating expenses for U.S. IOUs

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averaged ~$43/MWh—a useful proxy for marginal cost. U.S. Energy Information Administration

Scenario optimism. Many net-zero pathways leverage continued cost declines for solar and wind while assuming flat/upward costs elsewhere; real supply chains, commodity cycles, and financing conditions don't always cooperate. Planning should stress-test these assumptions at system level. Nuclear Energy Agency (NEA)IEA

Electrified assets—aluminium smelters, chemicals, steel EAFs, data centres, electrolysers, EV-charging infrastructure—survive or perish on power price and quality (availability, frequency, fault-ride-through). If the grid can't supply stable, affordable power, the asset—not the coal plant—gets stranded. Achieving electrification and renewable energy development may not be mutually compatible, given the raw materials required to overbuild and support the ambitions of NGOs and the goals set by Western governments to replace the world's fossil fuel assets. ESG compromises are neither addressed nor acknowledged as necessary to meet these aims.

European energy policy trends towards more price uncertainty for an electrified future

UK manufacturers paid about £258/MWh in 2023—among the highest globally—reflecting gas-on-the-margin pricing plus levies and network costs. The UK's own statistics show UK industry prices have remained well above the IEA median for years. Financial Times, Office for National Statistics. EU average non-household tariffs peaked at €0.215/kWh in H1-2023 and declined to €0.201/kWh in H2-2023, still significantly above pre-crisis levels—placing pressure on electro-intensive users. European Commission. A cascading grid event left 55 million people without power for 24 hours, with wholesale electricity prices surging 450% to €31.83/MWh the following day. Despite this spike, prices had averaged below €50/MWh for the eight days prior. The incident caused significant disruption and has accelerated grid-resilience initiatives (e.g. chiefly re-assessing the management of thermal power assets). Causation remains under review, but the blackout underscores system-wide reliability risks for the electrified industry. (Reuters AP News ENTSOE)

Dismissal of Coal's Contribution to Development Risks Preventing Poorer Nations to Develop

The current climate and energy narrative tends to focus almost exclusively on the negative side of coal's contribution by emphasising emissions, while omitting its role in human development, especially as coal continues to support not only electricity but also the steel, cement and agriculture that build communities and economies.

Affordable and reliable electricity is not just an engineering question; it is the foundation of modern society. As the graphic below highlights, there are no low-energy, wealthy countries. Nations with reliable and low-cost power achieve higher GDP per capita (see Figure 3), create more jobs and deliver stronger public services. Where electricity is expensive or unreliable, growth falters, competitiveness declines and societies are left behind.

For example, UN and World Bank data show that China alone has accounted for 80% of

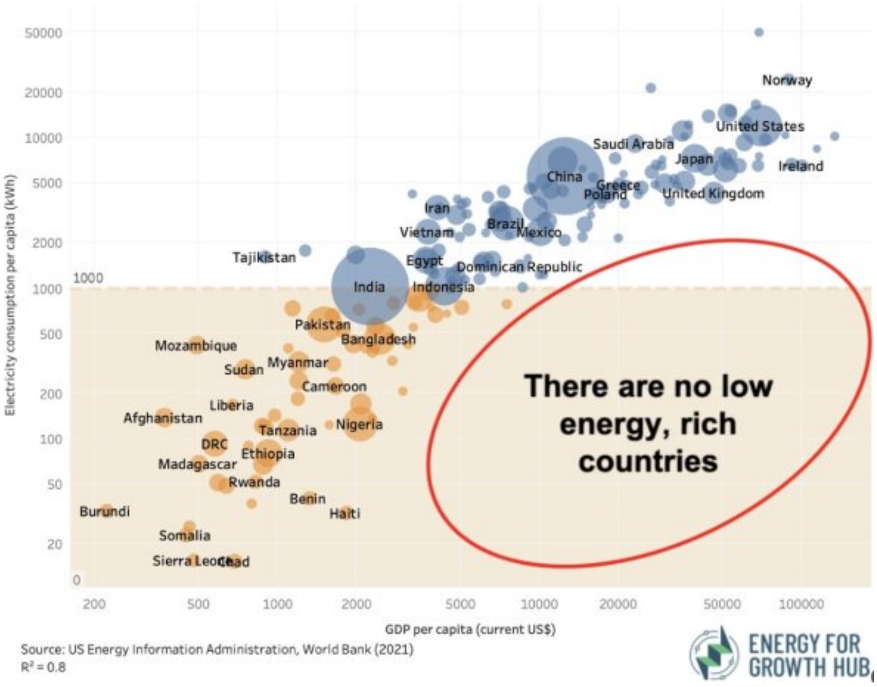

Figure 3 Electricity-rich nations create business and economic growth, and vice versa, compared with the energy-poor

global poverty reduction, bringing more than 800 million people out of poverty since the late 1970s. Most of this was achieved within the last 20 years. This achievement was powered by affordable electricity and the modernisation of its energy system with coal as a bedrock. This raises a vital question. Where would China be today if coal had been phased out 20 years ago? By ignoring coal's role in development, the narrative misses the real-world lessons of how nations move from poverty to prosperity and risks repeating mistakes that could slow development elsewhere.

What this implies for "stranding"

If system costs and reliability issues push industrial tariffs significantly above the marginal cost of existing dispatchable capacity, electrified industrial plants, commerce, logistics, and other sectors of the economy may become stranded assets (uneconomic to operate at contracted or expected prices). Where coal units are amortised and can operate within environmental limits—or upgraded (HELE/CCS)—they can provide firm, inertia-rich capacity and price risk insurance while grids scale storage, firm low-carbon, and transmission. This doesn't negate decarbonisation goals; it sequences them with reliability. Nations that maintain security in their grid system are less likely to face disruptive market and price pressures when electrifying automobiles, industry, household heating/cooling, commerce, and other sectors.

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Conclusions on Identifying and Interpreting Misinformation or Disinformation.

- Move beyond LCOE and discard any analysis or expert opinion that relies solely on this metric: Use system-cost metrics (including balancing, storage, transmission, and resource adequacy) in procurement and planning. Nuclear Energy Agency (NEA).
- Differentiate asset archetypes: Keep amortised coal vs. new-build renewable economics as a separate but relevant assessment and do not rely solely on new thermal vs new wind and solar.
- Pair VRE expansion with firm capacity (CCS, nuclear, hydro, long-duration storage) and grid-forming technologies – do not replace firm capacity with VRE.

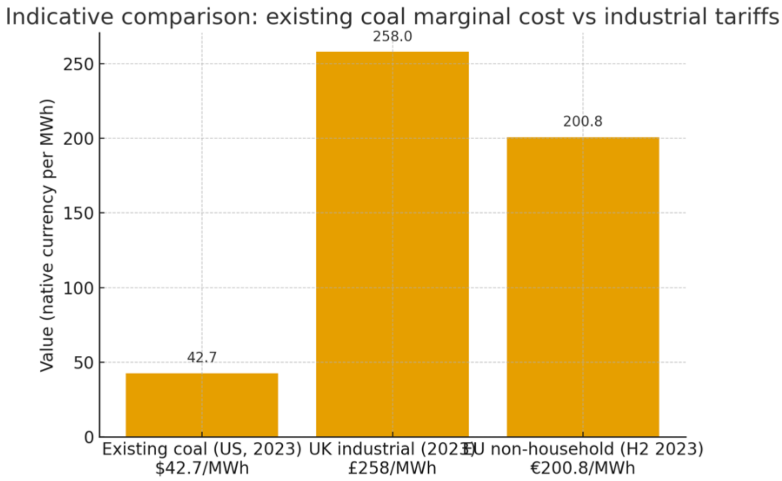

Figure 4 Industrial tariffs can vastly exceed the marginal cost of existing coal generation in the US – all other things being equal, coal power could make US potentially much more competitive than European based on energy prices.

(1) Existing coal (US IOUs, 2023) operating expense ≈ $42.7/MWh (EIA Table 8.4)
(2) UK industrial electricity (avg 2023) ≈ £258/MWh (FT, citing DESNZ/IEA)
(3) EU non-household price (H2-2023) ≈ €200.8/MWh (Eurostat)

(Source U.S. Energy Information Administration Financial Times European Commission)

Unrealistic Assumptions in Net-Zero Scenarios

Many net-zero pathways rely on a downward cost bias based on past trends—assuming renewable costs will continue to fall sharply. Meanwhile, fossil and other technologies stay flat or increase. These scenarios are often *stylised exercises*, with inputs tweaked to produce the preferred outcome rather than genuinely reflecting market realities.

In practice, achieving net-zero trajectories depends on a complex web of subsidies, mandates, and policy levers—support that cannot be assumed to continue indefinitely or at unlimited scale. Business leaders recognise that such mechanisms have limits: fiscal,

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political, and social. Ignoring these constraints risks creating targets on paper that cannot be sustained in reality economy.

(IEA Blob Storage, Nuclear Energy Agency (NEA))

Many net-zero roadmaps assume solar PV costs are projected to halve. China's solar industry has excess manufacturing capacity, which could lower costs but also raise strategic concerns. Maintaining low prices might aim to dominate markets and create dependency on Chinese technology, potentially impacting future supply chains. Historically, low costs in markets such as gas turbines allowed for penetration until prices rose, implying that higher costs in China's solar sector could burden foreign economies and increase reliance on China.

Scenarios built on optimistic cost curves may align with political aspirations but often fail to account for industrial, financial, and geopolitical constraints. Under real-World constraints and geopolitical tensions, supply chain volatility, resource competition, and industrial incentives can derail these projections. Scenario planning should reflect industry objectives, market dynamics, and geopolitical risks—not just ideal cost curves.

About us: FutureCoal: The Global Alliance for Sustainable Coal

FutureCoal is a global industry organisation dedicated to advancing sustainable coal stewardship, promoting cleaner technologies, and ensuring coal's role in sustainable, affordable, and resilient energy systems. As an international information organisation, it aims to strengthen this inquiry's objectives by supplying reasoned perspectives on past evidence and experience, enhancing transparency of assumptions, engaging in constructive dialogue, and addressing misinformation risks. In doing so, FutureCoal aims to position itself as a credible partner to ensure climate and energy debates are approached independently and grounded in fact rather than ideology.