

Ian Monroe

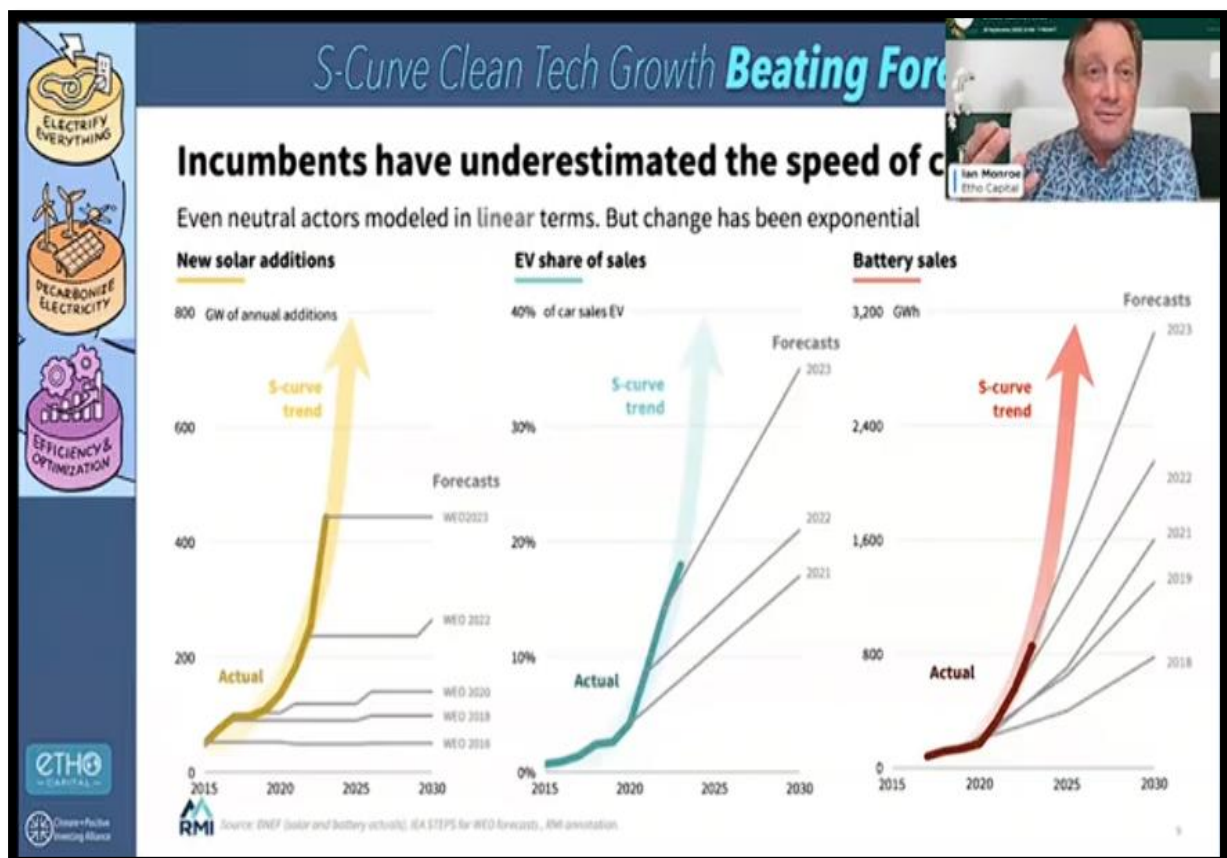
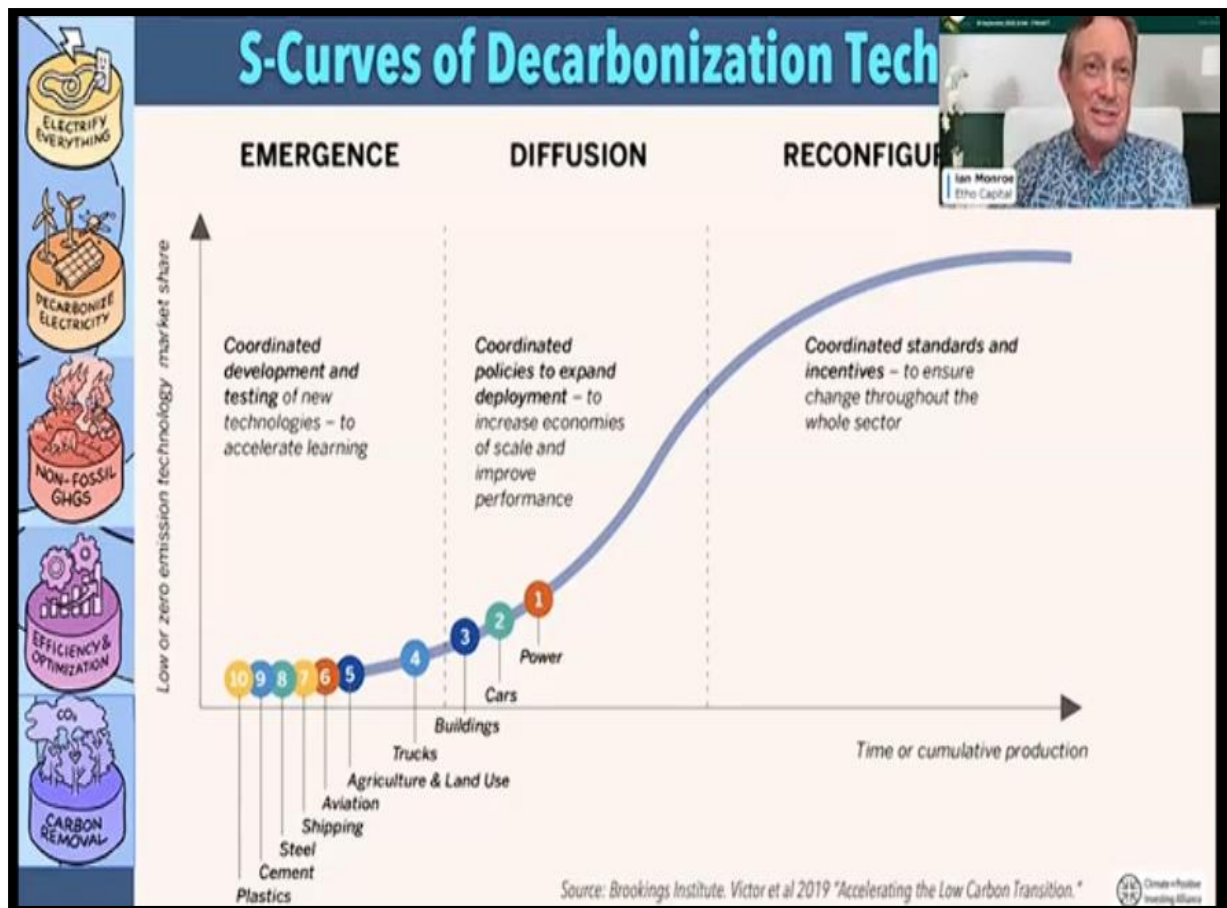
President and Chief Investment Officer, Etho Capital

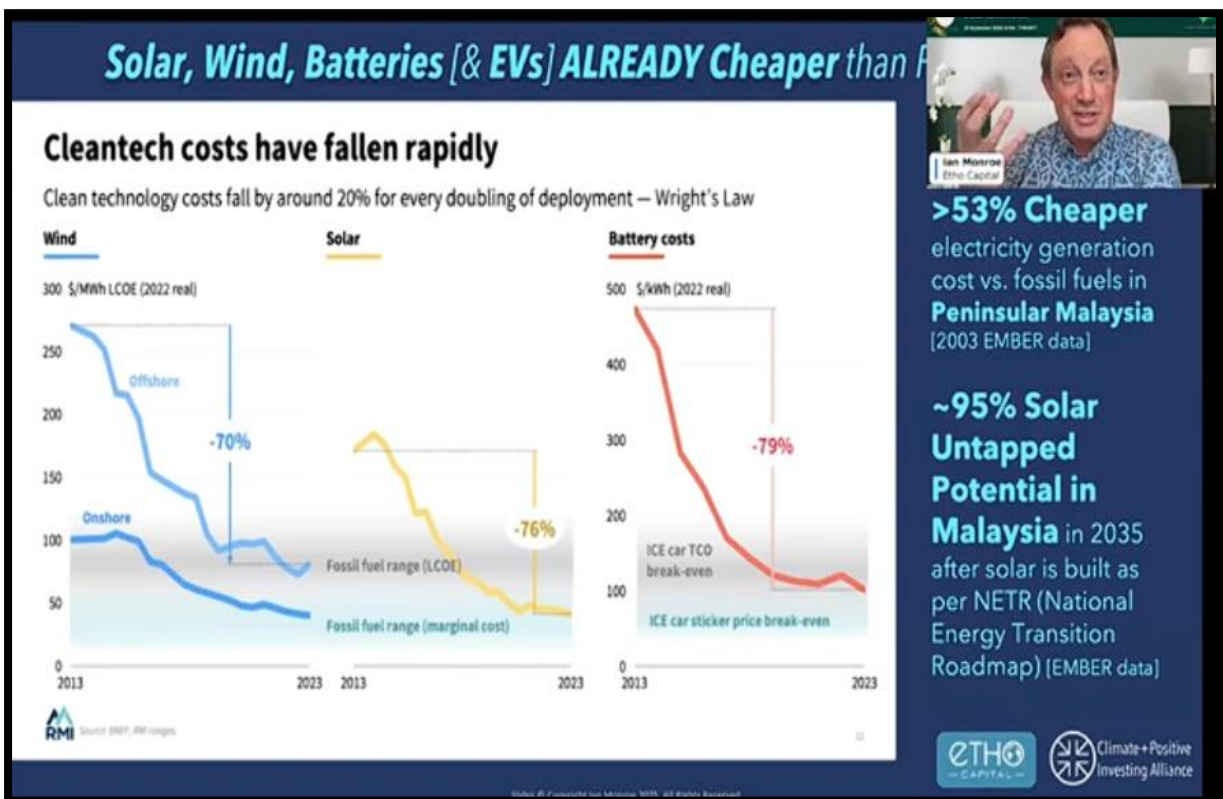
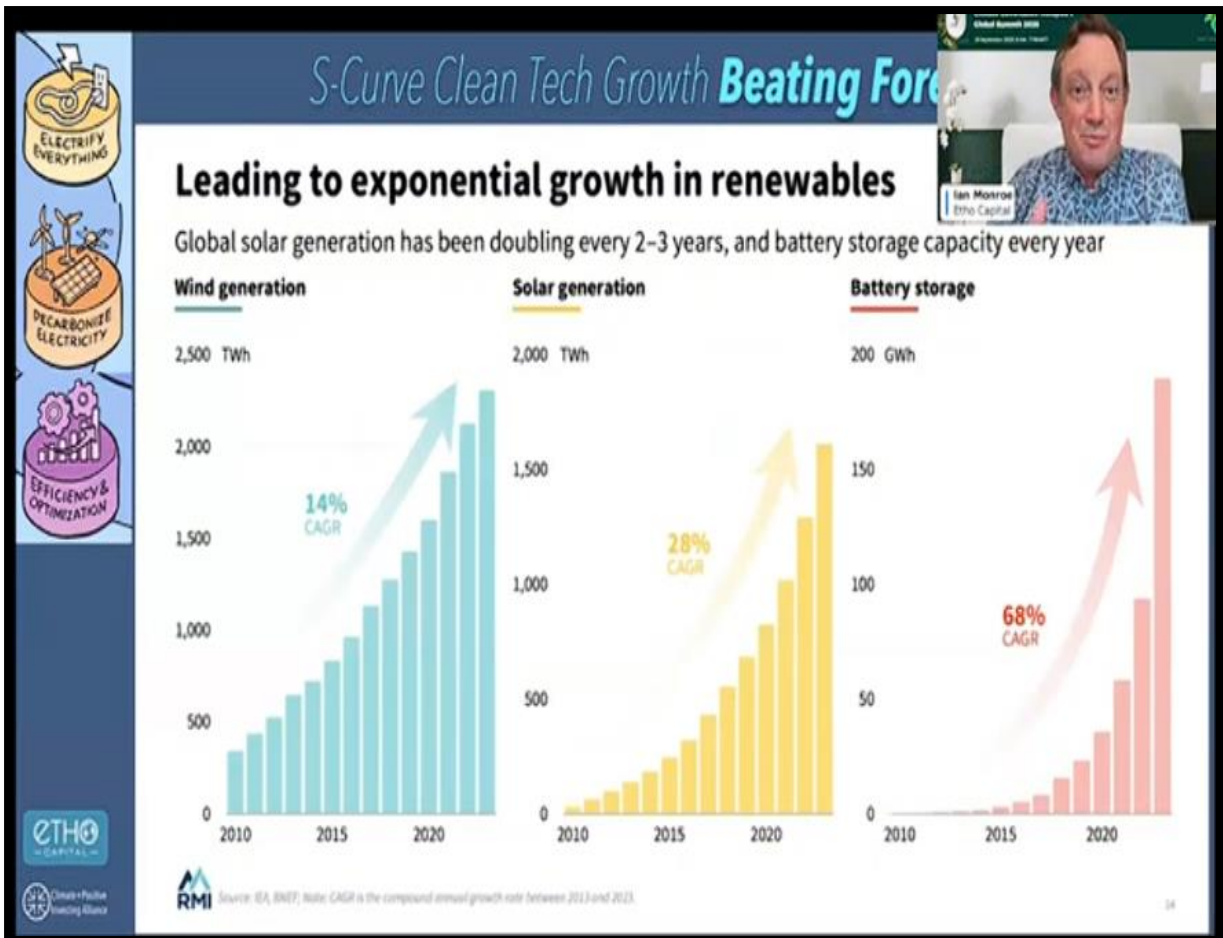
Discover how Ian drives climate-smart investing by identifying low-carbon leaders and turning data into action. Learn to align strategy with ESG, manage risks, and leverage finance to lead the net-zero transition.



Moderated by:
Chong Kok Wai
Council Member, CGM; Lead
Secretariat of CEO Action Network



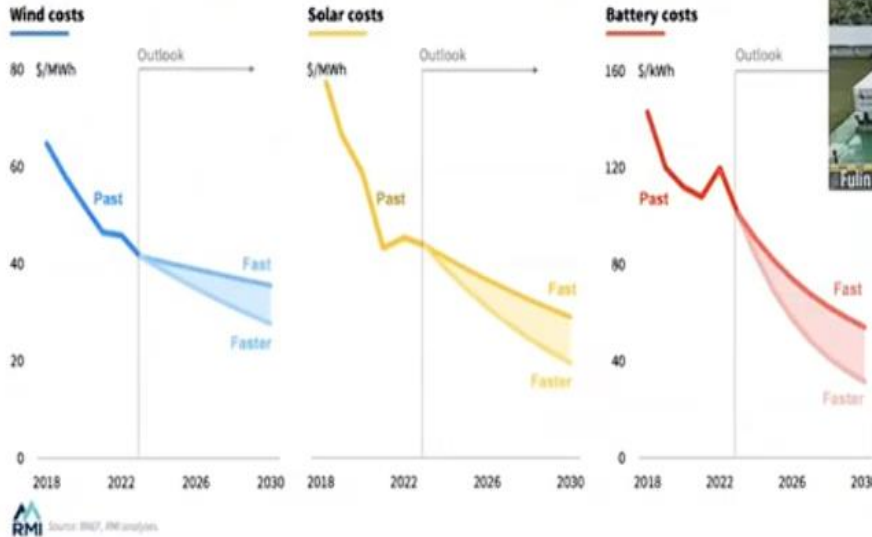




Solar, Wind, Batteries [& EVs] Soon **MUCH Cheaper** than Fossil Fuels

Cleantech costs will continue to fall

Solar, the cheapest energy source in history, will halve in price by the end of the decade



CAT



**<\$20/kWh
sodium ion
batteries?**

ETHO
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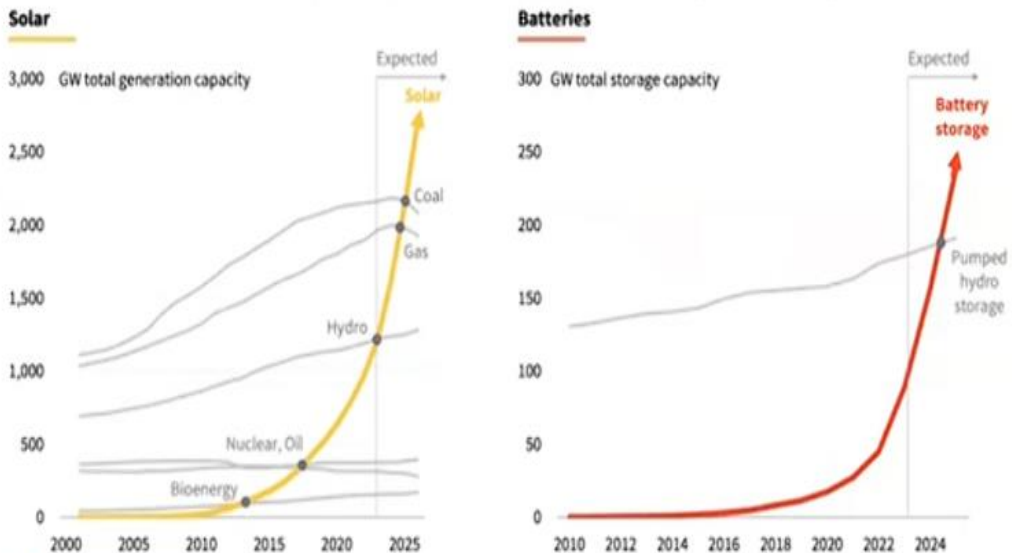
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Solar + Battery Systems Overtaking All Fossil Fuels

Solar and batteries are taking over

Solar will shortly overtake every other type of capacity, and battery storage will leapfrog pumped hydro



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RMI

Source: BNEF, IEA



Electrification = Efficiency : *Better, Faster, Cheaper*

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Agrivoltaics : Solar PV + Agriculture

- Existing herbaceous cropland in Malaysia could generate up to ~150TWh
- ~80% of Malaysia's current total electricity demand (Johnson et al 2024 "Potential of agrivoltaics in Malaysia")

28 January 2024 | The pilot project for Agrivoltaics has been successfully implemented for trial and evaluation, focusing on a variety of crops including Terengganu Sweet Melons, Passion Fruits, Sweet Corn, and Stingless Bees as an initial phase. The core of the Agrivoltaic system is a 10 kW solar array coupled with battery storage, which is designed to power a pump house. This setup facilitates the supply of electricity to 26 greenhouses and the irrigation system for Passion Fruit cultivation.

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Acqvoltaics : Floating Solar



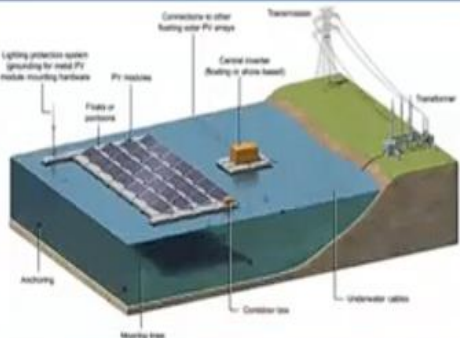
Ethos Economics Manager's
Global Summit 2024
19 September 2024 10:00 AM - 11:00 AM



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With "acqvoltaics," fish farms do double duty as solar plants

19 September 2024 10:00 AM - 11:00 AM
Ethos Capital | 100% On-Demand | 100% Free







The Batang Ai Floating Solar Project

- Malaysia Hybrid Hydro Floating Solar (HHFS) pilot on Kenyir Lake: Tenaga Nasional Berhad plans to expand 100kW pilot to **2.2GW capacity** (10% of lake's surface)
- 71MW** Batang Ai Floating Solar Project
- Floating solar or solar shades can also improve fish farms or other aquaculture [shading; bird protection]



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Solar Rooftops, Walkways, Bikeways &



Ethos Economics Manager's
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Singapore



Korea

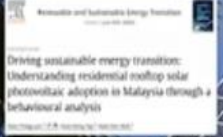


A 3.3-kilometer solar panel walkway sitting in the middle of a night-time highway connects Daegu and Daegu City in South Korea.

South Korean Ministry of Land, Infrastructure and Transport

With 1,302 solar panels installed at intervals of approximately 30 inches, the paneling covers 1 mile of the 5.5 mile cycling highway and are capable of producing an annual average of 2,300 kWh of eco-friendly electricity that powers many of the streetlights and electronic displays in Sejong. In fact, the solar panels produce an equivalent amount of energy to power approximately 600 households, according to South Korea's Ministry of Land, Infrastructure and Transport.

- Solar PV saves money;** now a cheap build
- Max co-benefits & min land-use with solar in urban infrastructure
- When **YOU** get solar it's much more likely your neighbors get solar



Driving sustainable energy transition: Understanding residential rooftop solar photovoltaic adoption in Malaysia through a behavioural analysis

19 September 2024 10:00 AM - 11:00 AM



Malaysia's first rooftop aggregation scheme for solar systems is now live. The program allows homeowners to lease or rent their rooftop for solar generation, with the electricity produced sold to commercial and domestic customers within a 1 km radius.

MAY 1, 2024 | 10:00 AM - 11:00 AM



SAVE ON ELECTRICITY SO YOU CAN SPEND MORE ON YOUR FAMILY.

Malaysia



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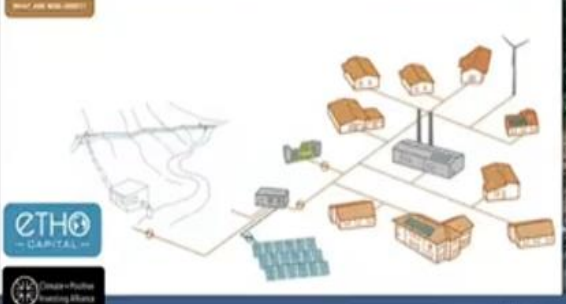




Rural Clean Energy + Battery Storage



Navigating Towards A Future Of Energy Equity, Right Livelihoods, And Wellbeing For Rural Sabahans



- cheapest, resilient & reliable
- skills training & economic empowerment
- social & ecological co-benefits

In One 11.6kW Micro-Hydro Project For A 54-Household Village, The Community Gained

- 50% energy cost savings
- 2-3X increased income
- 1,379 acres of rainforest protected
- 30,000 liters of fuel use on diesel generators diverted





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EVs : Cheaper, Safer, Better Driving Experience

- **Cheaper** to Make [at scale], Buy, Operate & Maintain
 - Costs ~70% to 80% less to drive electric vs fossil fuel
 - charge at home or office ~90% of time
- **Safer** in crashes & daily driving, **zero air pollution**
- **Better Driving Experience:**
 - quiet, smooth, fast, more responsive
 - 400km to >800km of range
 - fast-charge times, most ~20min (BYD @ 5min)

YOU get an EV → friends, family, neighbors, co-workers get EVs!

The **worst EV** already better than the best fossil vehicle...

What are you waiting for?





biggest source of

air & noise pollution



expensive & dangerous

safe, quiet, clean, cheap



better in every way!

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EVs : Prioritize Public Charging Infrastructure

- 1:10 charger-to-EV** ratio recommended (IEA)
 - Malaysia should have ~1.7 million public L2 & L3 chargers
- Policy Best Practices** : interoperability, card payments, solar shading + batteries, curbside, workplace & destination
- Smart Charging** (time w/ max solar) saves money
- Vehicle-to-Grid (V2G)** improves grid stability
- Heavy Duty Vehicle charging** (or swapping?) **corridors**











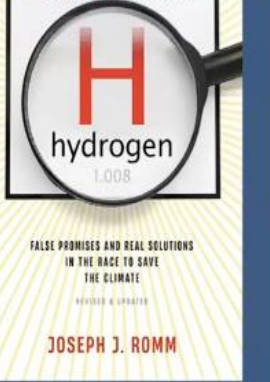


AVOID Dead-End Tech : Hydrogen for Transport

- Hydrogen is ~33x worse than CO₂ as a GHG [GWP20]
- H₂ gas leaks very easily + is **dangerous & hard to store**
- Hydrogen vehicles are often **worse for climate than fossil hybrid vehicles & much less efficient than EVs**
 - ⚡ Clean Power → EVs 🚗 = ~80% overall efficiency for motion
 - ⚡ Clean Power → H₂ → Fuel Cell Cars 🚗 = ~25-35% efficiency
 - So 2x –3x as much electricity needed for "green" FCEs vs EVs!
- H₂ filling stations very expensive vs EV charging

Why are we still talking about hydrogen vehicles?!?

~99% of H₂ from fossil fuels; H₂ production & sales = **fossil lifeline**

*Green H₂ might make sense for aviation, shipping, high-heat industrial uses, long-term energy storage & on-site uses [welding]




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Battery Production, Reuse & Recycle

- Focus on advanced **LFP + Sodium-ion** battery production
- Malaysia could be a **battery reuse & recycling leader**

Old EV batteries → 5-10+ yrs grid energy storage → 95% recycled for new batteries

EV batteries = 95%+ recyclable!

Climate Governance Malaysia's Global Summit 2021
Wednesday 24th June 11:00 AM

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Some of the world's most innovative new levels of carbon market performance.

Climate + Positive Investing Alliance

Building, Industrial & Transportation Electrification

We are poised to electrify the rest of the system

The global stock of EV cars and digital devices has been doubling every 2 years

Heat pumps

250 million

EV cars

40 million

EV trucks

400 thousand

Digitally enabled automated devices

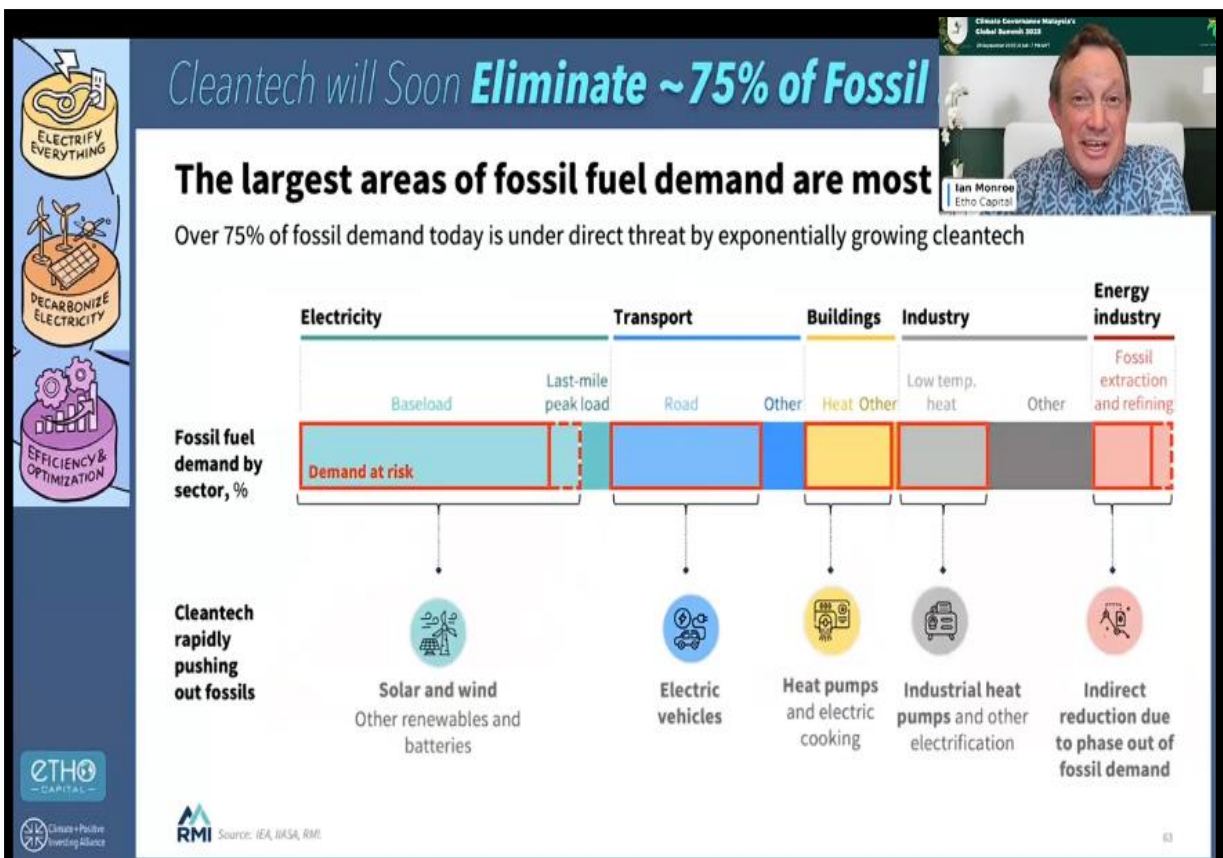
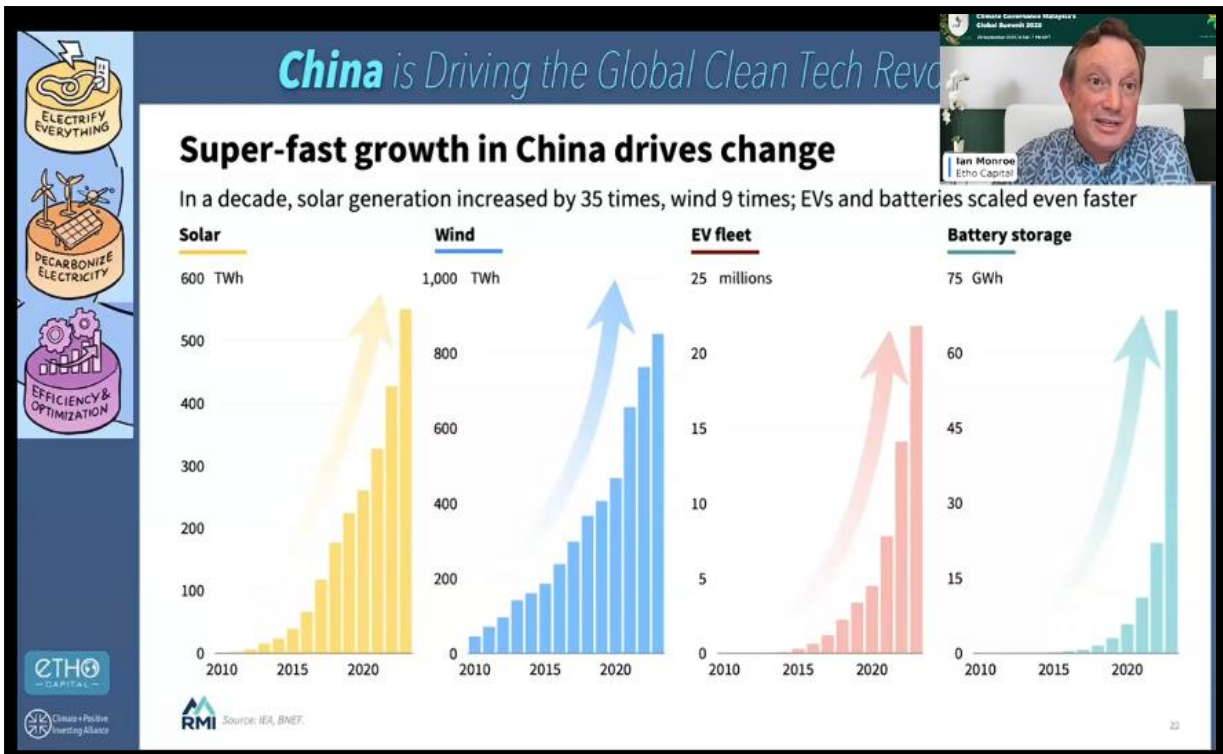
12 billion connected devices

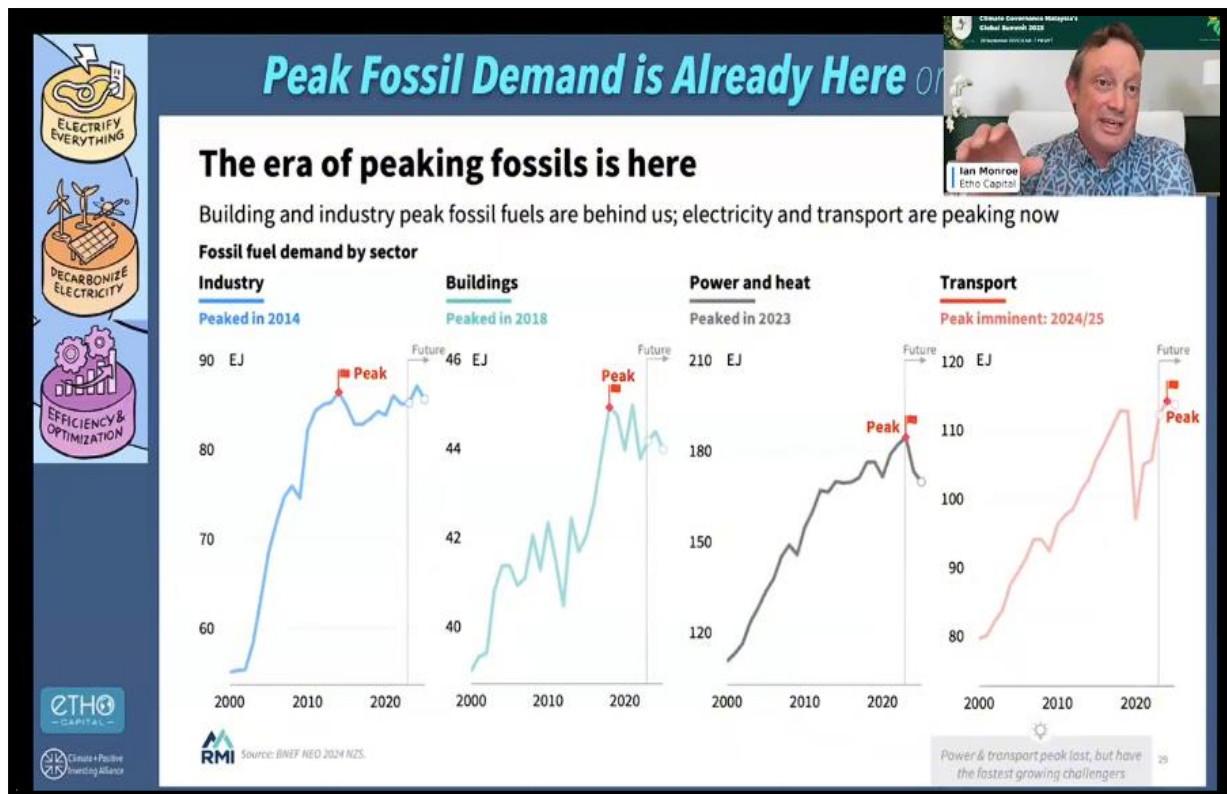
Source: IEA, Carbon Brief for heat pumps.

Climate Governance Malaysia's Global Summit 2021
Wednesday 24th June 11:00 AM

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Pricing Fossil Damages : Fossil Fuels Kill ~8 Million

Climate Solutions = Life-Saving Co-Benefits

Air Pollution Kills Far More People Than Covid Ever Will

More than 10 million people die every year from a problem that doesn't receive the attention it should.

Malaysia:

~23,000 pollution deaths/yr

MYR 303B (US\$ 73B)

~20% of GDP [Greenpeace]

Fossil fuel air pollution responsible for 1 in 5 deaths worldwide

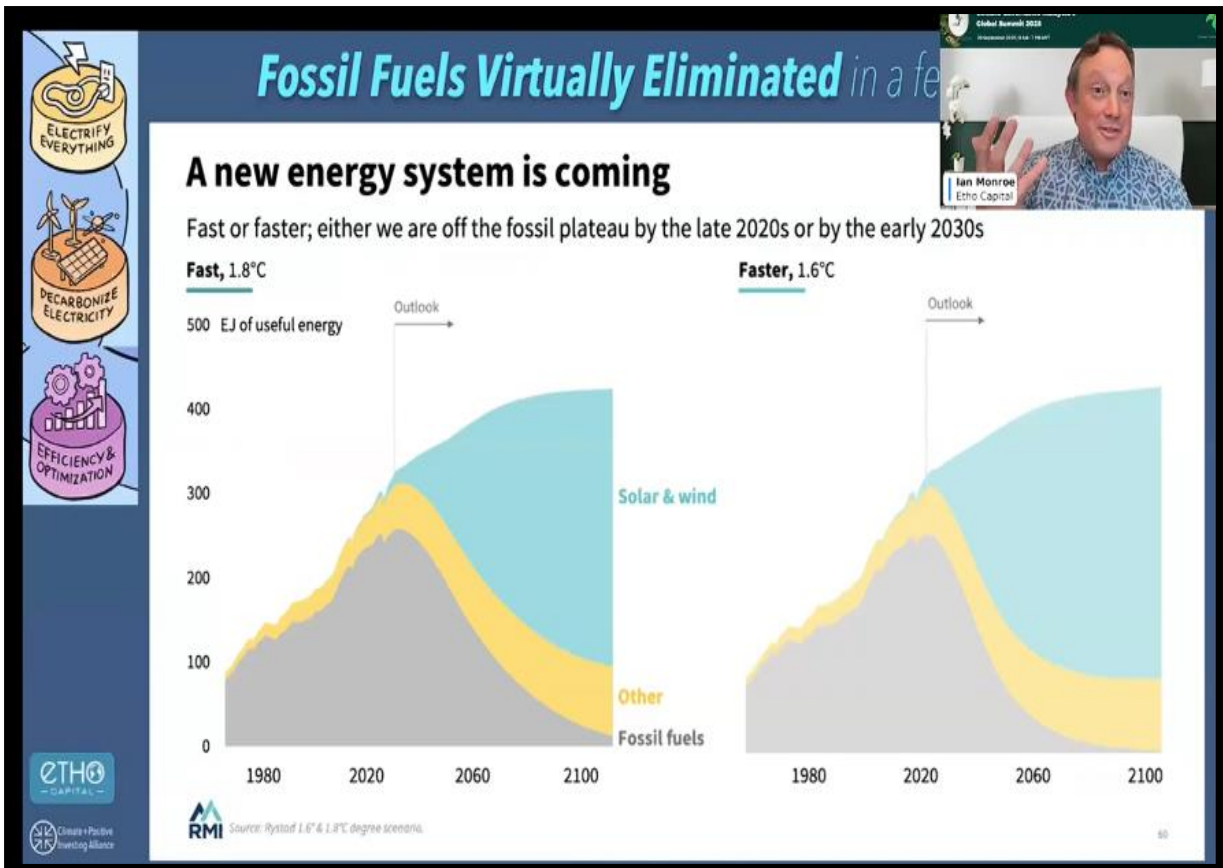
02/09/2021 | Environmental Research

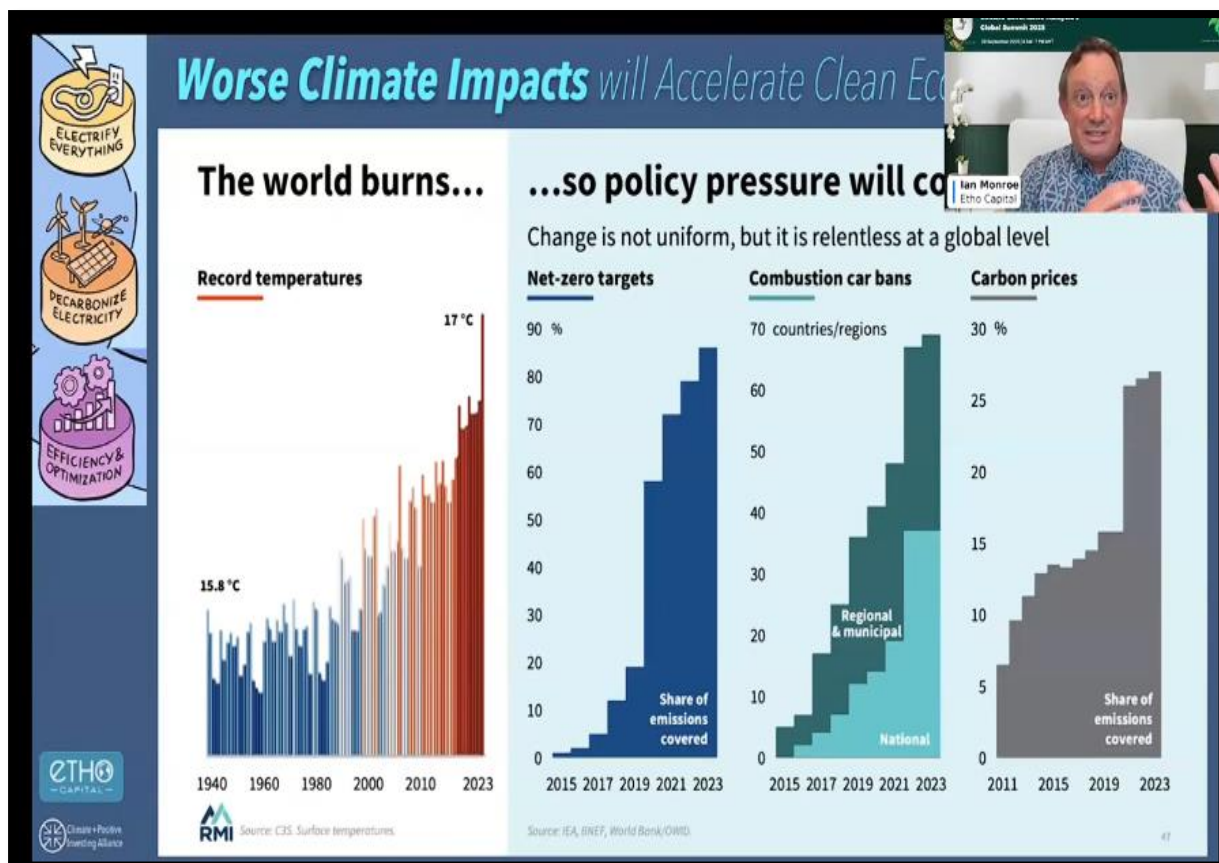
Wildfire Smoke Is Erasing Progress on Clean Air

By Mira Rojanasakul Sept. 22, 2022

Smoke from wildfires has worsened over the past decade, potentially reversing decades of improvements in Western air quality made under the Clean Air Act, according to research published Thursday from Stanford

+ fossil-funded oppression, wars, inequality, cancers & other pollution-linked diseases





AI & Climate

BAD Realities :

More energy, fossil fuels AI, consumption, waste, job loss, disinformation, distraction & conflict : **bad business models.**

GOOD Potential :

New monitoring data, materials, AI solutions, efficiency, time, engagement to drive action : **clean energy innovation!**

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Clean Energy = Essential for AI Data Centers

- **Clean energy + battery energy storage** is often the **fastest & cheapest** for new AI data centers
- **Energy deployment speed** often matters most
- **Clean AI policy mandates** can support **clean energy & grid stability**

The Global A.I. Divide

WHERE A.I. DATA CENTERS ARE LOCATED

Only 32 nations, mostly in the Northern Hemisphere, have A.I.-specialized data centers.



Source: Oxford University. • Note: Count of data centers in China excludes facilities in Hong Kong and Taiwan.

The New York Times

As countries race to power artificial intelligence, a yawning gap is opening around the world.

By Adam Satariano and Paul Mozur
Graphics by Karl Russell and June Kim
June 21, 2025

WHERE THE WORLD GOES FOR AI

Companies and countries that rely mostly on major American operators for A.I.

Companies based here ...

... that are operating A.I. facilities here



China 85% clean energy AI data center mandate

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World's Most Cost-Effective & Sustainable AI? :

Redwood Materials : Solar + Reused EV Batteries = 24/7 100% clean [& cheap]



REDWOOD MATERIALS

Crusoe

The key constraint for AI computing has really become energy and access

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Malaysia in 2035
 ~100% Electric Vehicles & Buildings, ~100% Clean Energy, ~ZERO Fossil Sales
 Agriculture & Forests → Agrivoltaics + Carbon Removal Economy

Climate Economics Malaysia
 Global Summit 2023
 28 November 2023 10:00 AM - 12:00 PM
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Health + Climate Action Starts at Home

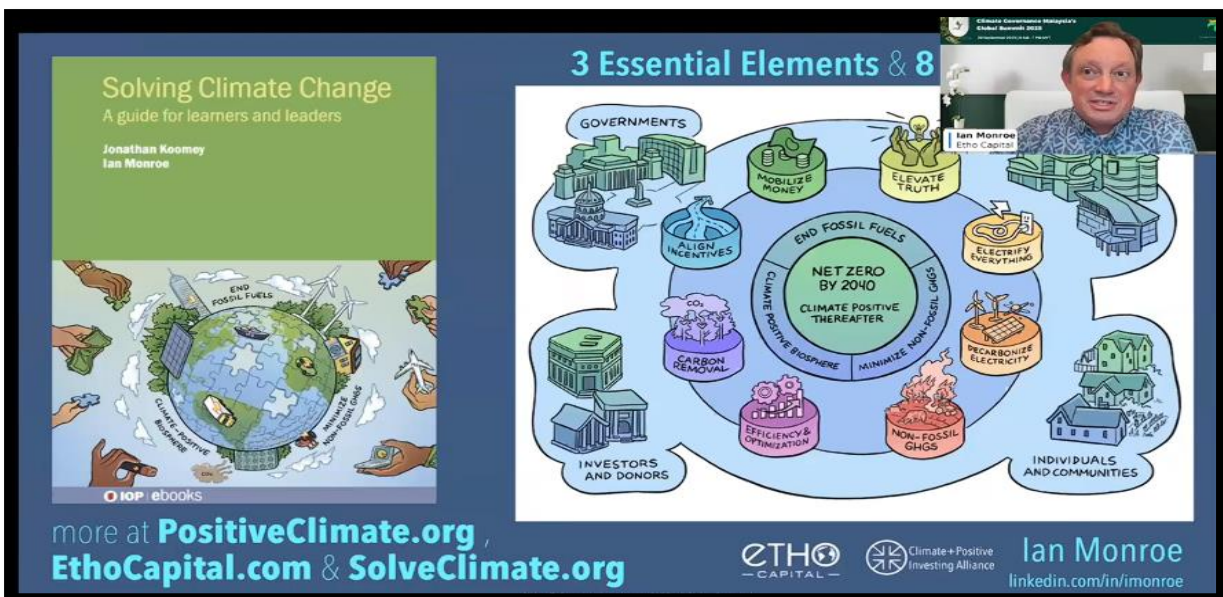
Electrify your life & inspire your community to join you!

Icons: ELECTRIFY EVERYTHING, DECARBONIZE ELECTRICITY, EFFICIENCY & OPTIMIZATION

Icons: Rooftop Solar Panels, Battery Storage System, Heat Pump HVAC, High-Efficiency Washer and Electric Dryer, Induction Cooktops, LED Lighting, Heat Pump Water Heater, Electric Vehicle, Electric Panel

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Solving Climate Change
 A guide for learners and leaders
 Jonathan Koomey
 Ian Monroe
 IOP ebooks

3 Essential Elements & 8 Climate Action Elements

GOVERNMENTS
 INVESTORS AND DONORS
 INDIVIDUALS AND COMMUNITIES

CLIMATE ACTION ELEMENTS:
 END FOSSIL FUELS
 CLIMATE POSITIVE BIOSPHERE
 NET ZERO BY 2040
 CLIMATE POSITIVE THEREAFTER
 MINIMIZE NON-FOSSIL GHGS
 DECARBONIZE ELECTRICITY
 ELEVATE TRUTH
 MOBILIZE MONEY
 ALIGN INCENTIVES
 CARBON REMOVAL
 EFFICIENCY & OPTIMIZATION

more at PositiveClimate.org,
EthoCapital.com & SolveClimate.org

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