

Vietnamese Farmers
Embrace Tech

Direct Air Capture:
Trillion Dollar Industry

Solar Mountain:
Sustainable Infrastructure

World's Largest
ZEBRA

Aussie
Billionaires
Energize Asia

Welcome

Seeing Things for the First Time

Humans have always been in the prediction business: we want to know what comes next and many in this generation like previous ones feel the end is nigh as climate change has brought about the negatives over the positives.

While we have significant problems to address, the world is a much better place than it used to be. According to Boston Consulting Group's recent analysis, the green economy is expected to create an estimated 67 million new jobs by 2030. As the new technologies arrive, so will the new jobs, creating the new world of work for net-zero.

We are also seeing innovative new things for the first time. But disruptive technology has been with us for centuries. Imagine being a reporter on February 21, 1804, covering the rollout of the world's first ever steam railway journey that ran a mere 15km from the ironworks at Penyarden to the Merthyr-Cardiff Canal, South Wales?

We will always marvel at the spectacle of technology: in this edition, we are witnessing even greater eye-popping first looks like how LED lights are being used to raise healthier and more resilient crops; how direct air capture sucks the CO₂ from our atmosphere, and public spaces integrating renewables in spectacular fashion; and how wind blades 62 meters in length are providing energy for entire cities.

And perhaps grander yet, how Asia is literally plugging into Australia, coming together to share resources for a magnificent clean energy project, the Australia-Asia Power Link, a 5,000 km undersea cable that will power 15 per cent of Singapore's energy needs.

Keeping it Clean
The HUB Team

Cover image: Solar Mountain by Nuru Karim and Anuj Modi uses solar photovoltaic, and recycled materials to contribute 300 MWh of electricity per year and interactive spaces for play and exercise. A top ten submission to the LAGI 2020 Fly Ranch Design Challenge.

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With new decarbonization laws in place, the Philippines is electrifying its transportation sector and with that, saying goodbye to the traditional Jeepney unfortunately without, for now, the vibrant colors, paintings of favorite animated characters, religious images or words of wisdom.



this issue.

OnePointFive

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OnePointFive^o

DECARBONIZING UPDATES & EVENTS

Skin in the Game

One of the world's largest skincare brands, [Beiersdorf](#), recently announced a long-term agreement with Singapore-based [TotalEnergies](#) for a rooftop solar PV installation to power 20 per cent of its Indonesian plant with clean energy. The company's manufacturing site, which produces international skincare brands such as Nivea, will be equipped with a 540 kWp solar power system installed by TotalEnergies. The system will reduce carbon emissions by around 660 tons per year; that's equivalent to charging 71 million Indonesian smartphones annually.

Pertamina Accelerates Transition

Indonesia's national energy company, [Pertamina](#), plans to spend up to US\$11 billion from 2022 to 2026 to develop its renewables business, a portfolio up from one per cent of the energy mix last year to 17 per cent in 2030. Pertamina also plans to reduce carbon emissions by 30 per cent in 2030.

The planned allocation for renewable energy represents 15 per cent of Pertamina's overall capital spending over the four-year term.



Philippines Fast Tracks Decarbonization

[Based on risk and industry research](#), changes in policies and regulations adopted by the Department of Energy (DOE) have led to the faster decarbonization of the energy sector. The DOE's Renewable Portfolio Standard (RPS) and the Green Energy Option Program (GEOP) have expanded the government's renewables project pipeline some 10 times compared to 2021. The RPS requires power distribution companies, electric cooperatives, and retail electricity suppliers to source part of their supply from RE. Under GEOP, consumers should have the option to tap RE for their energy needs.

Mumbai Details Net-Zero Plan

Considered one of the planet's most polluted cities, Mumbai recently provided detailed plans to zero out carbon emissions by 2050, that's two decades ahead of India's national goal, making it the first city in South Asia with a set timeline. The need for urgency is clear: the city of 19 million and its southern coast of fishing villages are expected to experience rising sea levels and severe flooding in the coming years.

Vietnam to Ramp up Renewables

Vietnam is eager to develop renewable energy and reduce its coal dependency by nearly doubling its total installed power generation capacity to 146,000 megawatts (MW) by 2030 and restricting development of coal-fired power plants. The plan takes into account Vietnam's commitment to turning carbon neutral by 2050. Vietnam is a regional manufacturing powerhouse, the largest electricity generator in Southeast Asia with a total installed capacity of 76,620 MW at the end of 2021, according to state-run utility EVN however wind and solar account for only 27 per cent of total capacity.

Industrial Supply Chains Decarbonization in SEA

A [report by Global Efficiency Intelligence](#) provides a detailed analysis of obstacles to supply chain decarbonization and highlights economic, information-related, and market barriers. Economic aspects such as high investment costs, hidden costs, and low profitability can often hinder suppliers, especially Small Medium Enterprises (SME), from implementing low-carbon projects. Insufficient information on costs, benefits and technologies, as well as a lack of technical expertise to develop energy management or decarbonization plans poses another major challenge. In addition, market barriers in the form of existing technical and regulatory hurdles across multiple geographies also need to be overcome.

Wind Needs to Stay On Course



The global wind industry enjoyed its second-best year ever in 2021, with almost 94GW of capacity added globally despite a second year of the COVID-19 pandemic. This is just 1.8 per cent less than the year-over-year wind energy growth rate in 2020 and a clear sign of the incredible resilience and upward trajectory of the global wind industry. The Global Wind Report 2022 from the [Global Wind Energy Council](#) makes clear that this growth needs to quadruple by the end of the decade if the world is to stay on course for a pathway to net-zero by 2050.

Regional Report: Few Committed to New-Zero

A staggering three billion people around the globe are highly vulnerable to the effects of climate change, with a large proportion of the most at-risk populations in Asia Pacific. However, few Asia-Pacific companies have fully embraced net-zero carbon emission strategies, a recent report by the Carbon Disclosure Project (CDP) has found. There are grounds for cautious optimism, however, as leaders in emissions strategies in the region announce ambitious targets and test innovative decarbonization methods. The report discovered that by the end of 2021 just eight per cent of companies in Asia-Pacific had committed to plans to reach net-zero carbon emissions. Furthermore, less than one-third of responding companies had adopted [science-based targets](#).

Study: Asian Banks Fall Short on Decarbonization

Asian banks, while critical to supporting the transition toward low carbon economies, have not kept pace with changing decarbonization expectations, according to Asian Research and Engagement (ARE). ARE, which “brings the voice of investors to Asia’s sustainable development challenges,” researched 32 leading banks listed in nine major Asian markets, basing their grades on governance, risk management, policies, and opportunities. ARE found none of the banks take sufficient action to meet the Paris Agreement objectives. The [report](#) indicates most banks are misaligned with their own national policies for decarbonization and mispricing exposure to carbon-intensive assets that are increasingly difficult to refinance or transfer.

Off-Grid Data Centers Powered Cleanly

Australian-based [Edge Data Centers](#) has closed a Series A funding round eyeing a rollout of facilities in Southeast Asia led by Cloud Link Solutions (CLS), a single investor based in Singapore. The firm offers data center facilities powered by on-site wind and/or solar power while being connected to the main grid as backup. Each data center provides roughly 1MW of solar infrastructure and a battery that supports 64 1kW quarter racks. Edge Data Center Founder Jon Eaves tells HUB: “We are very excited about the opportunity in Indonesia and currently considering several locations in Jakarta and Batam, which could potentially be our first Edge Centre.” Eaves adds that his company is on track to deploy 10 facilities across Asia in the next year that includes Thailand and the Philippines, in addition to Indonesia.

2022 Virtual & In Person HUB Events

July 8

Virtual - Indonesia, Philippines, Vietnam

Integrating renewables into public spaces

Panel discussion with live Q&A

August 10

Virtual - Indonesia, Philippines, Vietnam

Carbon capture & storage in SEA

Panel discussion with live Q&A

September 27

In person - Location: Jakarta

Providing incentive for battery recycling

Panel discussion with live Q&A

October 10

In Person - Location: Sanur, Bali

Rooftop solar opportunities for the tourism industry

Panel: Associate Director- Business Development, Cleantech Solar, Indonesia

November 30

In Person - Location: Nusa Dua, Bali

G20 Coverage

Panel discussion with live Q&A, and Post-event open networking session

December 10

Virtual - Indonesia, Philippines, Vietnam

Financing Cleantech Entrepreneurs

Panel discussion with live Q&A, and post-event open networking session

About Hub

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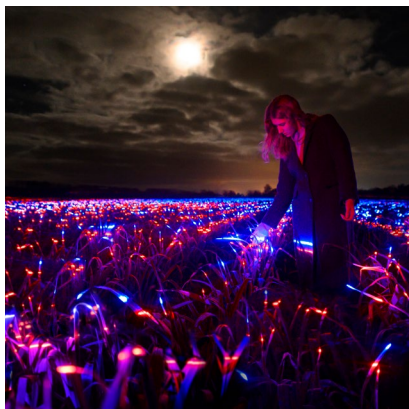
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Agri-Tech.

Shedding Light on Farming



Dutch designer and artist [Daan Roosegaarde](#) has transformed a field of common leeks into a radiant light show, in celebration of the crops that feed the world. Using LED lights, the show, called GROW, brings attention to how photobiological science – essentially light spectrums – can raise healthier and more resilient crops. The project from Studio Roosegaarde is one of a series of Dreamscapes which looks to “make the farmer the hero” and celebrates the planet’s life-sustaining agrarian traditions through art and science. The fields of leeks are transformed by night into a stage upon which millions of beams of light cast from projectors at the boundaries of the paddock reflect on every leaf. Roosegaarde tells HUB: “GROW highlights the importance of innovation in the agriculture system, cutting-edge light design helps plants grow more sustainably.” He added that Southeast Asia’s terraced rice fields could be considered for a future project.

Growing with Seed Funding

Singapore-based agri-tech start-up [Glife](#) has secured US\$1.2 million in seed funding. Investors include Global Founders Capital and 500 Start-ups. The company plans to create an online platform that connects farmers with restaurants directly, filling an apparent gap in the agricultural supply chain. The company intends to spend the newly-raised funds on technology development, particularly on a consolidated invoicing system that tracks and manages perishables in order to reduce food waste.

ARIA Secures Pre-seed Funding

The lack of new employee recruits to manage large amounts of crops is a growing issue in the Indonesian agriculture industry, resulting in many farmers experiencing crop failures and large losses. Agri-tech start-up [ARIA](#), headquartered in Jakarta, provides a solution using drones and IoT to increase productivity by providing prevention and predictive agricultural resources. Drone technology brings the added benefit of attracting young farmers with an interest in technology – platforms that could help growers achieve quality agricultural products with enhanced planting processes while minimizing labour in the field. The ARIA business model provides drones to farmers at a low-cost service per hectare. The model has also caught the attention of investors, with pre-

seed funding led by [GK-Plug and Play Indonesia](#), East Ventures, and market leaders in agriculture and logistics such as Triputra Group, Waresix, and Sahabat Group. This funding will develop ARIA's infrastructure network for distribution points in 17 branches across Indonesia while addressing a 40 billion-hectare market potential.

Vietnamese Farmers Embrace Tech

Hanoi is aiming to create a smart, high-tech and sustainable agriculture industry that can adapt to climate change. The city will focus on improving product value of longan, Canh oranges, Dien pomelos, flowers, ornamental plants, and seeds, while supporting the building of concentrated and safe production areas, developing key products and attracting business investment. The high-tech Cuoi Quy Organic Vegetable Cooperative in Dan Phuong district is seen as one of numerous agricultural models entered into the final round of the "I am a Farmer in the 4.0 period," a contest organized by the Vietnam Farmers' Association.

Sayurbox Aims to Reduce Waste

E-grocery start-up [Sayurbox](#) has raised US\$120 million in a Series C funding round led by Northstar and Alpha JWC Ventures (with participation from the World Bank's International Finance Corporation). The farm-to-table distribution platform offers more than 5,000 products, including vegetables, meat, poultry, snacks, and ready-to-eat

dishes, serving about one million customers in Jakarta, Surabaya, and Bali, and working with more than 10,000 farmers nationwide. The company's proprietary demand forecasting, inventory planning, and route optimization algorithms enables full visibility of its entire agri-supply chain – meant to help reduce food wastage and lower fulfillment costs.



Australian Agri-tech Hub

[Western Sydney University](#) is aiming to create a world-leading Agri Tech Hub from its Hawkesbury campus. The US\$34 million facility will be Australia's first high-tech commercial, teaching, and research greenhouse complex – creating new jobs, attracting industry, and driving agriculture innovation. Spanning six hectares, it will comprise a high-tech, industry-partnered greenhouse array and house agriculture technology for teaching, research, and commercial food production at scale. The facility will support the rapid export of high-quality, high-yield produce straight from Western Sydney into Southeast Asia.

Vertical Farming Goes Wide

A robotic system for automatic harvesting and pollination

is the latest from Singapore agri-tech start-up [Singrow](#), designed to help augment its plant biology solutions. In 2021 the company applied for a Productivity Solutions Grant to build a prototype for a robotic system. Specializing in vertical farming, Singrow has launched several proprietary crop varieties, including red and white strawberries, cherry tomatoes, komatsuna, mustard, vegetables, and saffron. The company's founder, Dr. Bao Shengjie, is currently raising funds to scale further in Singapore and expand in the region with plans to build a commercial-scale farm in Singapore by the end of 2022. Singrow also plans to supply seedlings to buyers and help with farm design and construction for franchisees abroad. The start-up has signed an agreement with a franchisee in the neighboring island of Batam and additional clients in Indonesia as well as Malaysia and the Philippines.

Food Waste Remains Issue

An estimated one-third of all the food produced in the world goes to waste, amounting to 1.3 billion tons of fruits, vegetables, meat, dairy, seafood, and grains that never leave the farm, get lost or spoiled during distribution, or are thrown away in hotels, grocery stores, restaurants, schools, or home kitchens. Research shows about six to eight per cent of all human-caused greenhouse gas emissions and methane, an even more potent greenhouse gas, could be reduced by stopping food wastage.

Carbon Capture.



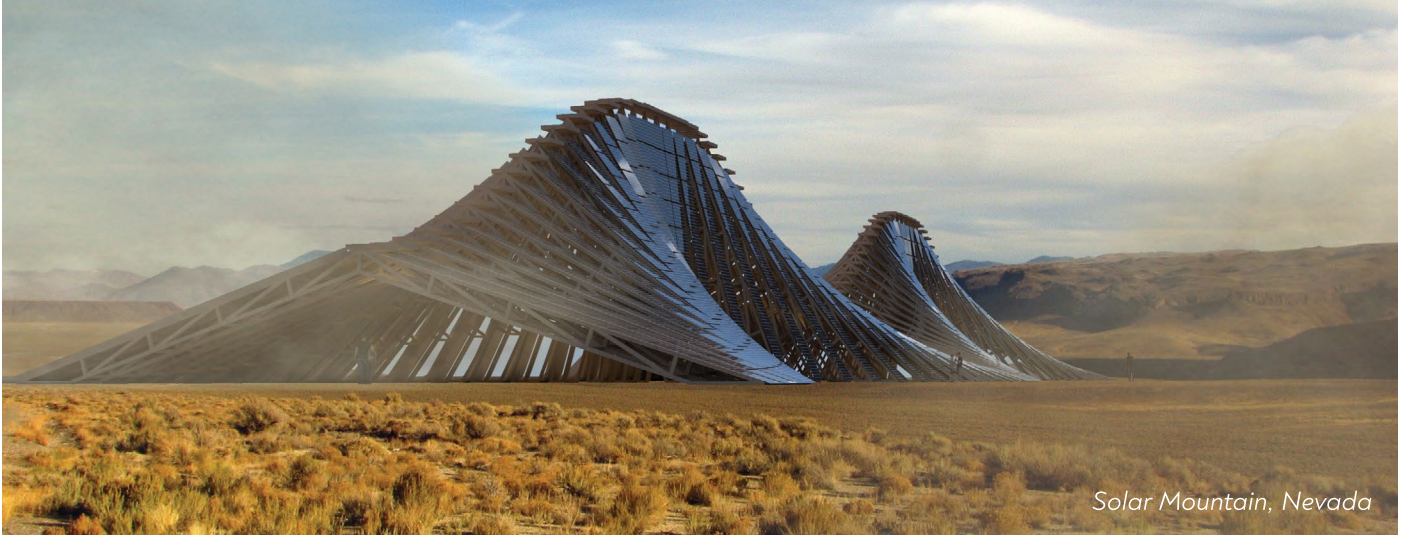
Time for Swiss Precision

Swiss-based [Climeworks](#) has signed an equity round of US\$650 million co-led by Partners Group. Climeworks has pioneered Direct Air Capture (DAC) technology and is widely considered the most advanced industry player with the world's largest direct air capture and storage plant launched last September. When the removed air is combined with underground storage, it allows the permanent removal of excess

and legacy CO₂ emissions, which can no longer contribute to climate change. The new base of funds come from several of the most renowned and largest institutional technology and infrastructure investors globally. The funding will unlock the next phase of growth, scaling DAC technology up to a multi-million-ton capacity and implementing large-scale facilities as carbon removal looks to become a trillion-dollar market.

Located in Iceland, Orca is the world's first large-scale carbon dioxide removal plant, making the vision of industrial-scale direct air capture and storage a reality. Climeworks has been able to intensify the procedure leading to increased CO₂ capture for an optimized process that means more carbon dioxide can be captured and stored than ever before.

Renewables.



Integrating Renewables into Public Spaces

Intentionally-beautiful and thoughtful architectural designs are having a greater influence on how infrastructure impacts the physical and visual environment, with engineers, architects, and artists exploring new ways of reimagining public spaces to minimize encroachment on the natural environment.

Mumbai-based architects, [NUDES](#), threw their proposal, Solar Mountain, into the bid for the [LAGI 2020 Fly Ranch](#) design challenge in Northern Nevada, a partnership between the [Land Art Generator Initiative](#) (LAGI) and Burning Man Project, the organization behind the annual Burning Man event celebrating anti-consumerism and self-expression.

LAGI helps design renewable energy and other sustainable infrastructures to create beautiful places for people. Working with governments such as Australia's State of Victoria, communities like the Ologresailie Maasai Women Artisans, and cultural organizations

like the Burning Man Project, LAGI is helping realize sustainable infrastructures as sculptural works of art.

"There is a great opportunity for Southeast Asia to demonstrate leadership on climate solutions that double as cultural destinations," LAGI Founding Directors, Elizabeth Monoian and Robert Ferry tell HUB. "Solar power projects need not look the same in every part of the world, and by using existing technology it is possible to design new energy landscapes that reflect the vibrant local culture of the communities where they are installed."

Solar Mountain incorporates a massive array of solar panels stretching from its central spine. NUDES calls the unconventional

curving a good fit to the dynamic landscape of geysers, wetlands, and hot and cold springs. The Solar Mountain design is made up of 182 solar panels rated at 300 W (1.2 kWh per day) for a total of 728, with a daily energy output of roughly 873 kWh (318,645 kWh per year).

Roof shingles are another example of redefining solar use in building integration. California-based [GAF Energy](#) (covered in the HUB January edition) uses photovoltaic roof tiles designed to solarize millions of residential roofs (which they call "roofs with energy").

[Sistine Solar](#) is another company increasingly considering aesthetics in the design of its residential and commercial plans.



The Massachusetts-based solar specialist says homeowners can now even design customized solar panels that blend in with their existing roofs, whether they are made of green architectural shingles, red Spanish tiles, or any other material.

Renewables.



The country is on the cusp of onboarding decent volumes of renewable energy

UPC Renewables Power Indonesian Provinces

Construction will soon begin on a 150-megawatt wind farm located in Sukabumi, West Java, developed by [UPC Renewables](#) and targeted for completion by 2024, says the Institute for Energy Economics and Financial Analysis (IEEFA). UPC Renewables has also developed and launched the operation of a 100-hectare Sidrap wind farm in South Sulawesi, the first utility-scale wind power project in the country, achieving its Commercial Operational Date (COD) in April 2018. Established in 1995 and active in Asia since 2006, the company operates 13 offices globally, with 11 offices in nine countries throughout the Asia Pacific region. UPC Indonesia Director, Dacre Purchase tells HUB: “The country is on the cusp of onboarding decent volumes of renewable energy from multiple sectors such as wind, biomass, solar, geothermal, with plenty of options once the government’s roadmap for delivery is better understood and supported.” For now, Indonesian Energy and Mineral Resources Minister Arifin Tasrif states that wind is the second-biggest renewable energy source in terms of the country’s estimated potential, able to deliver up to 155 gigawatts (GW) once fully developed in line with its potential. Specifics about the strategy have not yet been detailed.



Preserving Salt and Rice with Wind

Norwegian renewable energy solutions provider, Scatec, has refinanced wind power plant, Dam Nai, in Vietnam. The wind farm, situated in Ninh Thuan province, is approximately 350 kilometres north of Ho Chi Minh City.

The power assets, located in the middle of rice fields, will not only provide green power to thousands of homes but also preserve natural sea salt and rice production, two industries that are vital to the local economy.

Wind Milestone

Wind turbines now generate over 2,000 gigawatt-hours of electricity in the U.S. – more than nuclear and coal – says the [Energy Information Administration \(EIA\)](#). In 2021, wind was the fourth-largest electricity source, generating close to 380 terawatt-hours for the year (a terawatt is a thousand times bigger than a gigawatt). Germany also recently broke records for wind energy and is reported to be surpassing the U.S. The offshore wind market enjoyed its best-ever year in 2021, with 21.1 GW commissioned, representing three

times more than the previous year. China’s mammoth year of offshore installations accounted for 80 per cent of that growth, helping it pass the U.K. as the world’s largest offshore wind market in cumulative installations. The [Global Wind Energy Council](#) states, the wind industry enjoyed its second-best year, but scaling up for net-zero requires a policy breakthrough. Record years for several regions and offshore wind reflect strong market growth, but installations must still quadruple by the end of the decade to meet a net-zero pathway.

Renewables.

62-meter prototype blade is made with Elium resin



World's Largest ZEBRA

General Electric (GE), the multinational conglomerate led by French-based IRT Jules Verne, has unveiled the world's largest thermoplastic blade, designed to serve as a full-scale example of a fully recyclable wind turbine blade. IRT Jules Verne project manager, Céline Largeau tells HUB: "Work on the ZEBRA project is progressing according to schedule, and has all the necessary expertise for the deployment of sustainable thermoplastic wind turbine blades. The manufacturing of this first blade is a great success for the entire consortium and the wind industry in general." Thermoset composite turbine blades cannot be recycled (a University of Cambridge study suggests that there will be 43 million tonnes of blade waste around the world by 2050). [The Zero Waste Blade Research \(ZEBRA\)](#) project is working on identifying more sustainable materials, in the form of thermoplastic composites. The 62-meter prototype blade is made with Elium resin, a glass-fibre reinforced thermoplastic – material that is 100 per cent recyclable and delivers a similar level of performance to thermoset resins, favoured for their lightweight and durability.

Strong Offshores in Philippines' Favor

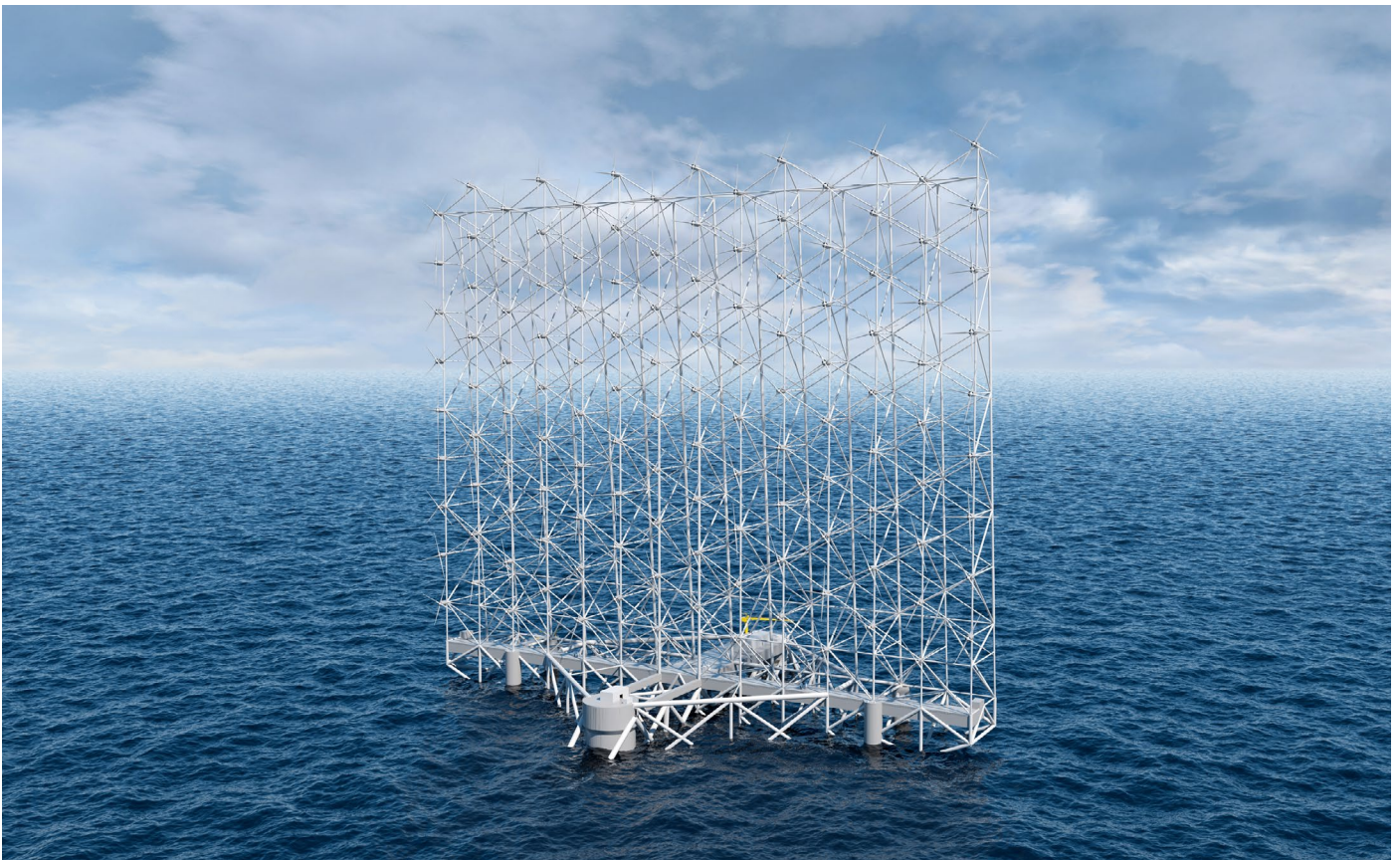
A roadmap for wind energy in the Philippines was recently released by the Department of Energy (DOE) and the World Bank Group (WBG) highlighting the enormous potential for offshore wind power, albeit with a need for long-term vision, infrastructure development, investment, and good policies. [A WBG press release](#) indicates two potential scenarios: the low growth scenario provides a roadmap for installing offshore wind at levels in line with the DOE's national renewable energy program, and the high growth scenario provides a roadmap for installing much elevated levels, which could drive competition, investments, and additional cost reduction. Analysis of the low growth scenario suggests that the Philippines has the potential to install 3GW of offshore wind by 2040, making up three per cent of the country's electricity supply. Analysis of the high growth scenario shows the potential to install 21GW, making up 21 per cent of its electricity supply. Mordor Intelligence says the greatest wind resources in the country are in the northern and central areas of the Philippines, including Batanes and Babuyan, and central Luzon.



This first blade is a great success for the entire consortium

Vietnam Captures Wind Opportunities

A collaborative offshore wind power project in Vietnam is in the works between Tokyo-based [Renova](#) and Ho Chi Minh City-based [Petrovietnam Technical Services Corporation \(PTSC\)](#). In a [joint press release](#), PTSC said they will establish a cooperative relationship regarding scouting, preparation, offshore survey, development, construction, implementation, operation, and maintenance of the offshore wind power project, with a view toward commercialization. Renewable energy specialist, Renova, stated it aims to assist in the "decarbonization of the country in cooperation with the Vietnamese government, partner companies and residents." A [report by McKinsey](#) affirms Vietnam's commitment to increasing its energy capacity using renewable sources and favourable macroeconomic conditions that may create valuable opportunities for wind investors and developers.



Towering Wind Platform

An offshore floating “windcatcher” grid that rises over 300 meters offers a renewable power design of integrated turbines, the latest innovation by Norwegian-based Wind Catching Systems (WCS). Moored to the ocean floor, it can generate five times the annual energy of the world’s biggest single turbines – sufficient energy to power as many as 80,000 homes. WCS says the array of small turbines eliminates the need for a massive single component, making them easier to manufacture, install, and maintain. After the floating platform is deployed, the installation and maintenance work can largely be conducted on-site, without the need for specialist cranes or vessels. Backed by North Energy and Ferd, the company claims its windcatcher units will have a 50-year service life, unlike the 30-year lifetime of a conventional wind turbine. WCS CEO, Ole Heggheim, tells HUB that Southeast Asia has prime locations for its systems: “The World Bank has

shown that Indonesia as an example seems to have an underutilized potential for bottom-fixed wind and there are areas of good potential for floaters as well. On the equatorial line it is important to utilize the available pockets of high wind, and our system has the benefit of highly concentrated production.”

Hydro Plant to Operate in Sarangani

Alsons Power currently operates four power facilities in Mindanao generating 468 megawatts and this year will provide an additional 14.5 megawatts of clean energy with the completion of its Siguil Hydro Power Project in Sarangani. The run-of-river plant will capture the flow of Siguil River from Barangay Nomoh to Barangay Amsipit. The water will return to the Siguil before discharged into Sarangani Bay. Alsons is also looking at putting up seven more run-of-river hydro power facilities in various parts of Mindanao and Negro Occidental.

Solar Farm in Cagayan

Aspiring to be the largest listed renewables platform in Southeast Asia, Philippines-based, ACEN and CleanTech Renewable Energy 4 Corp. have formed a joint venture company, Natures Renewable Energy Development Corporation (NAREDCO) to develop, own and operate a 133 MW solar farm and transmission line project located in Lal-lo, Cagayan. Once completed, the facility will produce 188 GWh of renewable energy annually, enough to power 75,000 households while avoiding approximately 112,405 MT of CO2 emissions annually. About 1,000 job opportunities and community partnerships could be created during the solar farm’s construction stage. It is expected to be operational by early 2023.

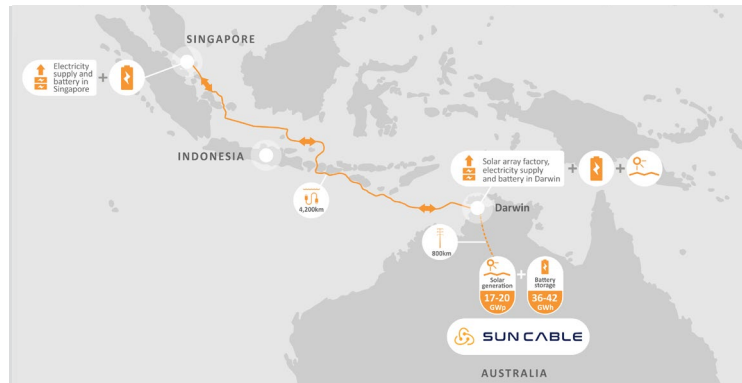
Aussie Billionaires Energize Asia

Australia's two richest men have jointly led Sun Cable's US\$152 million capital raise for an ambitious project (cost at US\$22+ billion) to supply Singapore with solar power (15 per cent of Lion City's energy needs) via a 5,000 km transmission system. Sun Cable tells HUB its Australia-Asia Power Link will harness solar energy from the world's largest solar farm and battery facility in Australia's Northern Territory and export it from Darwin to Singapore via a subsea cable system that wends through the Indonesian archipelago.

The private companies of Andrew Forrest's Squadron Energy, founder of iron ore giant Fortescue Metals Group Ltd, and Mike Cannon-Brookes' Grok Ventures, co-founder of software maker Atlassian Plc, raised their investments as the Sun Cable project moves toward becoming a supplier of renewable energy to the region. Once completed, the infrastructure will facilitate large-scale industrial development through the electrification of new and existing industries and support regional decarbonization.

HUB Cleantech discusses Indonesia with David Griffin, Founder and CEO of Sun Cable

HUB: Indonesia is an important part of Sun Cable's strategy. How will your activities increase trade and strengthen ties between Indonesia and Australia, especially ahead of the G20 Summit in Bali?



CEO,
David Griffin



Singapore's Clean Energy Conundrum

According to the Ohio-based [Institute for Energy Economics and Financial Analysis](#) (IEEFA), Singapore's clean electricity success rests on support from exporting nations. The city-state's serious commitments to shift its energy dependency from natural gas power imports could be at stake. This is due to Indonesia's lack of clarity on power export regulations and Malaysia's ban on renewable energy exports. IEEFA stated that In April 2022, Singapore-based Sun Cable submitted its Environmental Impact Statement to Australian authorities. Designed to support Singapore with 17-20 GW solar farm and 36-42 GWh of battery energy storage in Australia's Northern Territory. The future of the Australia-Asia Power Link project now rests on authority approval in the Indonesian waters.

Griffin: Sun Cable is a committed long-term partner of Indonesia. We want to assist the country to be at the heart of the new renewable electricity industry. The Australia-Asia PowerLink project will drive transformational benefits to Indonesia's economy, including investment of up to US\$2.5 billion in the country over the life of the project. This includes procurement of system components such as acquiring batteries from Indonesia's new factories, subsea cable installation and cable maintenance.

HUB: A key pillar of the upcoming G20 is "sustainable energy transition." Given Sun Cable's renewable energy and transmission expertise, how can this be leveraged for greater regional benefit?

Griffin: Sun Cable is looking forward to deepening knowledge sharing partnerships with Indonesian entities, to support positive renewable energy outcomes in the country. To achieve this, we will build upon existing relationships with leading Indonesian universities and overall look forward to continued work with Indonesia as the country seeks to access its renewable resources.

The Circular

8 Questions

with **Yeni Tjiunardi**,
Investment Director of New Energy Nexus Indonesia, the world's leading ecosystem of funds and accelerators supporting diverse clean energy entrepreneurs.



1 HUB: What do you look for as the perfect candidate to receive your organization's Smart Energy Grant funding?

Yeni: A good candidate will have clear activity and output planned, with obvious technical expertise, initial understanding of its first market as well as ambition to build a scalable and impactful business. Apart from the candidate's team, technical feasibility, a business model and business partnerships are some of the factors that New Energy Nexus Indonesia will take into consideration in awarding the grant.

2 HUB: Tell me how efficient SWAP Energi is for daily commuters around Indonesia and what was the moment that New Energy Nexus realized this company fits all the criteria for funding?

Yeni: E-motorcycles that have been sold so far in Indonesia are using plug-ins for recharging the batteries that require four to six hours to charge. We think that the very low adoption of e-motorcycles indicates that the plug-in model is not preferred by Indonesians when it comes to adopting e-motorcycles due to an expensive acquisition price (compared to ICE motorcycles), lack of after-sales service availability, and charging inconvenience.

With SWAP Energi's retail price not being far from that of ICE motorcycles, combined with deployment of portable batteries readily available whenever needed, we think that SWAP Energi could change the current landscape and spur an uptick adoption of e-motorcycles in Indonesia, especially in Java in the near term where more than 50 per cent of Indonesia's population resides. Apart from the retail price, SWAP has also developed an app to help its users access all information about their electric motor and the battery and find the nearest SWAP Points, which we think

is important in supporting the transition in the user's behavior.

3 HUB: Do you look at geothermal and ocean energy pitches as closely as you do solar and wind?

Yeni: As New Energy Nexus' global mission is to support clean energy entrepreneurs and companies, such as geothermal and ocean energy activities that require big tickets of investments are not our priority for New Energy Nexus Indonesia.

4 HUB: New Energy Nexus has supported some 60 start-ups in Indonesia through incubation and acceleration programs; how many more can we expect in the coming year and can you give us a clue as to anything exciting we must know about?

Yeni: We aim to support a total of 75 start-ups through our Smart Energy Program (accelerated and incubated) by the end of 2022. We are also organizing [RE]Spark Clean Energy Festival which will be conducted on the 2nd and 3rd of June 2022 in Jakarta, where we will invite and gather stakeholders (such as the ministry of energy



and mineral resources, private sectors, clean energy start-ups, NGOs) to participate in a series of activities such as hackathon, exhibitions, series of workshops as well as investment speed dating to match potential start-ups with prospective investors.

5 HUB: In this edition we cover how solar can be applied to all kinds of structures, even art installations; do you think as solar and renewables become related to lifestyle rather than just utility that we will expect more of the populace of Indonesia to get onboard?

Yeni: Every aspect or sector that uses energy can be shifted to be more sustainable and efficient. For example, we're seeing start-ups developing more products and services to support more sustainable energy use in the tourism industry. NEX globally supports diverse clean energy entrepreneurs, from emerging tech to clean energy deployment and adoption—with accelerators, training and mentoring, funds, as well as networks to provide global solutions and put the equity at the center of the clean energy economy. We know that

getting the right resources for entrepreneurs at the right time will unlock the clean energy solutions the world needs to tackle the climate crisis and make clean energy accessible for 100 per cent of the population.

6 HUB: Tell me about your (RE)Charge series, “Boot Camps” correct? This program is open to engineers, developers, designers, energy professionals and entrepreneurs passionate about clean energy; tell me about a few of the positive outcomes so far.

Yeni: [RE]Charge Series is a two-day deep dive Bootcamp that helps NEX Indonesia identify potential start-ups to join our incubation/acceleration program (Smart Energy Program). [RE] Charge series helps start-ups discover their potential customers, market research, as well as team building. Through the series, we are able to find promising start-ups and partner with them.

From one of the latest [RE] Charge series, we were introduced to BANANA & Partners, a start-up that focuses on Waste Management,

Renewable Energy, Circular Economy, and Blockchain. BANANA & Partners then joined our incubation Smart Energy Program. Up until 2021, BANANA & Partners were able to reduce 1,452 tons of Plastic Waste.

7 HUB: New Energy Nexus is headquartered in California with offices worldwide; does the Indonesian office share ideas on new energy solutions with your counterparts that could be developed right here in Indonesia?

Yeni: Yes, we do believe that networking is the key to keeping us running better programs, and seeking more innovative solutions for our mission. We're actively connecting our start-ups with our global and local networks.

8 HUB: Is the future for renewables bright for Indonesia?

Yeni: Yes, if we accelerate investment in RE and address challenges in the RE infrastructure and if the government's commits to focus on increasing renewable energy that is aligned with our goal to achieve net-zero emissions by 2060.

Energy Storage.

Startup Builds Giant Toaster Oven

What about the idea of heating metal blocks to extremely high temperatures to produce electricity on-demand or, direct heat energy, inside a modular box roughly the size of a shipping container? Not so unlikely: the California-based [Antora Energy](#) team has been developing the concept since 2018 and this year secured US\$50 million from Bill Gates's Breakthrough Energy Ventures, Lowercarbon Capital, and other established climate tech investors. Antora runs electricity through blocks of graphite causing them to heat up like a giant toaster oven to reach 2,000 degrees Celsius. The company says planet-warming gases generated by industrial activities are traditionally tough to clean up and the industry contributes roughly 30 per cent of greenhouse gas emissions, including factory processes and the electricity they consume.

Ramon Hydro Storage

Norway's [Scatec](#) together with the Philippines' [AboitizPower](#) have announced a joint venture for a 20 MW battery energy storage system (BESS) project at the Magat hydropower plant in Ramon, Isabela. Final preparations for construction are underway aimed at starting in the last quarter of this year with targeted commercial operation by 2024. Scatec says the Magat facility is a significant step

forward to its renewable energy ambitions over the next 10 years, capable of dispatching energy to the grid at times of peak demand primarily for ancillary services.

Waste-to-Energy Product.



HomeBiogas Apparatus

Converting organic household waste into energy for cooking is going commercial and [HomeBiogas](#) aims to provide a realistic proposition for eco-conscious households. The Israeli company first emerged as a crowdfunding campaign offering families a way to produce homegrown cooking gas by feeding food scraps into a digester chamber. The company has recently reworked its design, based on customer feedback, to come up with a re-imagined digester shape, allowing for a larger bacteria biodome and 30 per cent more cooking fuel. The redesign boosts biogas production, which the company says is sufficient for two hours of cooking each day. The HomeBiogas consists of an inlet, outlet, digester, and gas bag: to create greater efficiency, it is best suited for sunny areas and merely requires animal manure to catalyze the digestion process.

EV Roadways & Waterways.

Formula 1 Could Go All-Electric By 2035

The recent launch of the [Gen3 Formula E](#) at the Monaco E-Prix presents a significant development in performance and technology for the electric racing series. However race experts believe, a major decision will need to be made to go all-electric or not. For now, the Gen3 Formula E car will be introduced for the 2023 season. The car now has an additional 250kW (335hp) motor on the front that is entirely used for regeneration, while the power of the rear 250kW motor has been increased to 350kW (469hp). Formula E cars can complete an entire 45-minute race using just a 52kWh battery with a top speed of nearly 325 kph.



A major decision will need to be made to go all-electric



Sharging Ahead

Thai EV charging solutions company [Sharge Management](#) has teamed up with Chao Phraya Express Boat Co to replace its belching, oil-fuelled boats and help drive the expansion of the EV industry in Thailand. The public transport operation is a well-known brand that has been carrying passengers on the rivers between Bangkok and Nonthaburi for some 50 years. The company will build a total of 30 electric boats, increasing to 40 over five years. The vessels will be charged by 360-kilowatt direct-current charging outlets, the first of which will be installed at Maharaj pier. The new EV service is scheduled to start in late 2022 with each boat carrying up to 250 passengers. Sharge also plans to expand its EV charging business to homes and condo projects.

Sailors Get Feet Wet with Hybrids

Electrification of ships in the Atlantic Canadian waters is well underway, led by [Glas Ocean Electric](#), a young company specializing in electric boats and renewable energy. The marine builder was founded by Sue Molloy, a naval architect and ocean engineer specializing in ship propulsion. Molloy began the task of conversion with a research project (in partnership with Transport Canada) to retrofit the Alutasi, a 20-year



old, heavy and inefficient Cape Islander vessel.

The Alutasi is currently enjoying its second life as a hybrid EV, equipped with a new 135-kilowatt motor that handles all the ship's low-speed propulsion needs. The result is 40 to 60 per cent lower fuel costs, as well as a 60 per cent reduction in maintenance costs (its diesel engine is now only used for high-speed maneuvers). Glas Ocean Electric is also undertaking the retrofit of a fishing boat from the rugged Northumberland Strait, and a further 10 clients are booked over the coming months. The efficiency of electric motors and the energy density of lithium-ion batteries have advanced to the point that Southeast Asian boat builders also have the opportunity to consider similar hybrid retrofits, allowing sailors to begin electrification without having to part with vessels that remain in good shape.

Farewell to the Iconic Fossil-Fueled Jeepney

While many Filipinos oppose the

planned phase-out of the country's beloved public transport bus, the Jeepney, its days may be numbered.

The [Philippines Electric Vehicle Industry Development Act](#) includes a new regulation designed to promote the manufacturing and development of EVs in the country, along with the end-to-end installation and maintenance of charging stations. Jeepneys are an iconic part of daily life in the Philippines and were first cobbled together using Jeep parts left behind after World War II, then adapted into transport vehicles. Modernized passenger buses seating 23 passengers – e-Jeepneys – recently did a “demo run” and proved to be ready for the road, powered by a 15 kW electric motor and 96V lithium-ion battery pack that allows the e-Jeepneys a range of 55km per full charge and a top speed of 45 km/h. There are between 180,000 and 270,000 franchised Jeepneys in the Philippines, and roughly 75,000 in Metro Manila alone.



Toyota Beams in Land of Smiles

Thailand is moving quickly to provide EV incentives, tax breaks, and subsidies to fortify its position as an Asian EV manufacturing hub. A recent deal with Toyota appears a good move, given that roughly a third of Thailand's vehicle market is a Toyota Motor Thailand customer. The company is looking at launching its bZ4X EV model later this year. In 2021, the Thai government hastened its plans to transition the country's automotive sector to electric mobility – supported by a healthy supply of nickel for battery components from Indonesia. Companies with electric vehicle components and production facilities in Thailand include Daimler, Toyota, Nissan, Honda, BMW, Mercedes, Evelomo, Foxconn, Gogoro, and more recently, SAIC. The production of zero-emission vehicles and components in the country includes both Battery Electric (BEV) and Hydrogen Fuel Cell vehicles (FCEV), from micro-mobility to heavy duty-long-haul vehicles.

EV Fleets Deliver

Canada: A round-up of fully-electric vehicles are coming to Canada for companies looking to electrify their fleets. A recent study found that more than 60 per cent of fleets would see financial gains if they electrified their vehicles today, due to the long-term fuel savings that EVs offer. A number of significant fleets, such as Pride Group, the Ontario-based logistics firm, have already signed deals. And Amazon has commissioned Rivian to produce its electric Prime van, with an estimated 100,000 EVs to be on the road by 2030.



Indonesia: Mitsubishi Motors Krama Yudha Sales Indonesia recently signed a deal with Pos

Indonesia, Haleoya Power, Gojek, and DHL Supply Chain Indonesia for a pilot study on commercial EVs. The four companies are examining the usage of a Minicab–MiEV, a model currently marketed in Japan. The study will aim to understand and explore commercial EV applications by verifying actual usage data, including mileage, charge history, and delivery routes.

Philippines: Meralco, under its Green Mobility program, has committed to electrifying its vehicle fleet while DHL Express Philippines will deploy a new fleet of EVs to handle deliveries in Metro Manila and other major cities. The Ayala group, through its industrial arm, Integrated Micro-Electronics Inc., has deployed additional charging stations into Ayala shopping malls.

Space-age Batteries Charge Quickly

With the help of NASA, Nissan has come up with an extremely efficient battery that looks set to revolutionize the world of EVs. The new all-solid-state battery will replace the lithium-ion battery by 2028 and be about half the size of current models though able to achieve a full charge in a mere 15 minutes.

EV Batteries.



Singapore Sets New Standard for EV Battery Swapping

Global technology leader, [Gogoro](#), has announced a new standard for two-wheel battery swapping in Singapore that establishes requirements for safe installation, maintenance and operation of EV charging – a significant path to accelerating EV adoption in the city-state. A statement by Gogoro says: “One of the greatest challenges of our time is transforming our urban transportation into a new generation of smart and sustainable electric two-wheel vehicles that are accessible and that people can embrace.” The Gogoro Network provides an open and interoperable battery swapping platform that is recognized as the

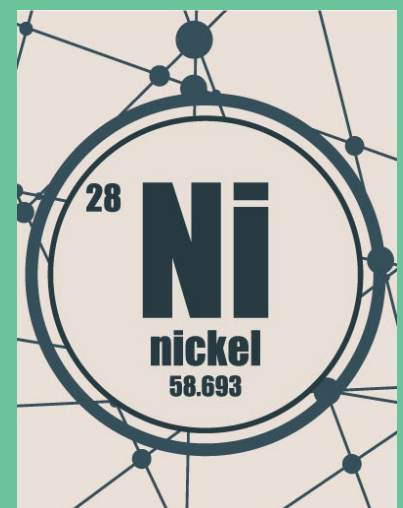


Indonesia has the world’s largest nickel reserve

leading battery swapping company for lightweight urban vehicles worldwide. Gogoro Network describes itself as a new generation of swappable battery refuelling that is smart, scalable, and continually optimizing itself to be dynamic and versatile for people, communities, and businesses. With more than 455,000 riders and over 10,000 battery swapping GoStations at over 2,300 locations, Gogoro Network is hosting 340,000 daily battery swaps, with more than 280 million total battery swaps to date.

Nickel: The New Gold

Indonesia, with the world’s largest nickel reserves, at around 21 million metric tonnes, is looking to convert this lucrative resource into finished products, as reported by the [Asian Pacific Foundation](#). With the rising demand for electric vehicles (EVs), nickel, the key component of EV batteries, is becoming a hot commodity. For Indonesia, exporting nickel ore would be the quickest and easiest way to profit from this global “nickel rush.” However, the ore is significantly less valuable than the batteries themselves, and moving nickel up the domestic value chain is imperative to boosting the country’s profit margins through value-added products and increased job creation.



Sustainable Travel.



Boutique Resorts Good Fit for Renewables

Many travellers to Southeast Asia want to know they are getting there and staying sustainably. However, when it comes to making choices on assurance renewables as part of their experience, it's often unclear who the truly green accommodations are – beyond lodgings that promise to recycle single-use plastics and encourage guests to reuse their towels.

Tourism can play a significant role in addressing climate change through two main strategies, according to the journal *Advances in Climate Change Research*: mitigating measures which tackle the causes of climate change,

such as renewable energy, environmentally-friendly infrastructure, and best practices in solid waste and water management – and adaptation measures to cope with its effects.

The region's tropical corners have many advantages: natural flowing water and plenty of sun certainly help meet net-zero power needs for boutique properties. Charlie Hearn of Bali-based [Inspirial Architecture and Design Studios](#) tells HUB: “Over the years our clients have become far more receptive to integrating green tech into our buildings, due to both the long term ROI, as well as the reaction of the public being drawn to genuinely green developments.” Hearn and his studio are behind

the design of [Ulaman Eco Resort](#) located in Tabanan, Bali, which combines photovoltaic panels, solar thermal, and a number of hydroelectric generators. Ulaman Eco Resort owner, Dino Magnatta, tells HUB: “Renewable integration here at the property – that is sun and wind and additional energy from the Ulaman River and lake – generates power through custom-designed hydro systems.” The Canadian expatriate explains that water turbines can generate power continuously, day or night, and that hydropower, along with the resort's 138 solar panels over the parking area, provides plenty of energy with any extra sent back to the grid.

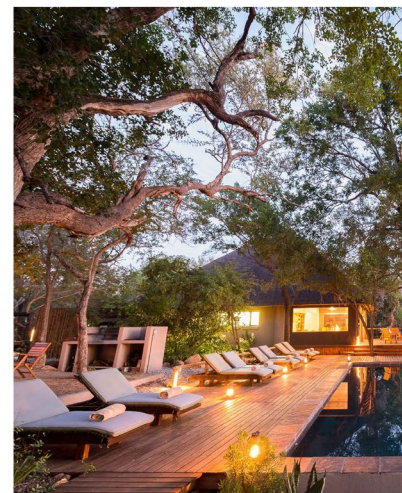
Sustainable Travel.

Sustainability Shaping the Future of Travel

Booking.com's annual [Sustainable Travel Report 2022](#) (now in its seventh year), gleaned data from over 30,000 travellers across 32 countries and territories – and it's an eye-opener for both travellers and those in the hospitality trade. The details of the report are clear: travellers seek planet-first options like never before and are spending more time searching for brands that are sustainable. As the climate crisis experiences new challenges and global awareness increases, data reveals that sustainable travel is no longer the purpose of the few. The report exemplifies the desire to make more conscious choices beyond transportation and accommodation, and deeper than merely recycling and limiting waste. Says Booking.com: "With a growing respect for the world's local communities, the environment and biodiversity, a regenerative philosophy is starting to influence decision-making... with more travellers making decisions informed by climate concerns and ever mindful about how far they travel and how they get there."

Asia Pacific Airlines Commit to Net Zero

The trade association for the [Association of Asia Pacific Airlines \(AAPA\)](#) has pledged to aim for net-zero emissions by 2050.



The renewed commitment is much more ambitious than in the past, with a built-in comprehensive sustainability agenda, and a 1.5 per cent fuel efficiency improvement while stabilizing CO2 emissions through carbon-neutral growth. Sustainable aviation fuels (SAF) play a large part in the commitment to almost completely replacing fossil fuels on commercial flights by 2050. AAPA says support from governments and stakeholders to "commercialize SAF through research and development, subsidies, incentives, as well as

the allocation of resources for its development and distribution" is tantamount to ensuring supply demands meet overall needs. AAPA says adequate quantities of SAF will be needed by the airline industry, as some 80 per cent of emissions are from long-haul flights, since aircraft powered by alternative energy such as electricity and hydrogen are not currently available. The Asia Pacific region will amount to an estimated 40 per cent of global SAF demand, however AAPA stresses that "production and supply facilities in the region are lacking."

Airlines Onboard to Tackle Food Waste

Teaming up with social impact company, “[Too Good to Go](#),” Swiss International Air Lines (SWISS) is testing the possibility of offering its customers unsold fresh food items inflight at reduced prices, in a bid to minimize waste. The Certified B Corporation, says food waste is putting the planet under enormous strain; entire forests are cleared to grow produce that will never be eaten, and scientists have learned how food releases harmful greenhouse gases when it is disposed of unsustainably.

[All Nippon Airways \(ANA\)](#) will begin offering expanded inflight meal options on select international routes, featuring healthier dishes and ingredients with less environmental impact. The new dishes align with the values of [ANA Future Promise](#), the airline’s initiative to promote sustainability. Approximately 248 tons of food waste and 28 tons of oil are collected every year by ANA catering, and since 2008 the ANA Group has recycled 100 per cent of the waste into compost and animal feed. By uniting a range of programs under a single banner, ANA employees are empowered as they work together to achieve 2030 and 2050 sustainability benchmarks.

The Lufthansa Group has been offering innovative food services on its flights through the [Austrian](#)

[Melangerie initiative](#), a novel proposal for passengers to take home any food that was not consumed during their flight. For a small contribution, one or two products will be provided in a paper bag, together with wooden cutlery.

China Airlines (CAL) recently operated a flight from Taipei to Singapore to demonstrate its commitment to sustainable development. The [flight featured up to 100 environmental](#) and carbon reduction initiatives, including fuel-efficiency route planning, apron operations, online check-in, and in-flight catering, including food sourced mostly from local and seasonal Taiwanese ingredients.

Singapore aviation catering provider ([SATS](#)) will design an advanced food hub in Singapore’s Jurong Innovation District. The company will deploy automation and robotics to achieve operational efficiency and hone vital new skills for the future. The food hub will be networked with the IoT technology to provide data that will aid planning, increase asset utilization, and reduce food waste.

Hotel Sustainability Roadmap

The Singapore Hotel Association (SHA), GSTC Destination Member and Singapore Tourism Board (STB) worked together to launch the Hotel

Sustainability Roadmap at the inaugural Hotel Sustainability Conference and Marketplace, the Global Sustainable Tourism Council (GSTC) [reported](#). In line with the [Singapore Green Plan 2030](#), the roadmap sets out targets and strategies for hotels to adopt in their sustainability journey. This, in turn, enables the industry to contribute to sustainable development goals, capture new opportunities presented by the Green Economy, strengthen enterprise resilience, and tap new visitor segments. The roadmap envisions a hotel industry that integrates sustainability as a core value across the entire hotel ecosystem, establishes a living lab, uses sustainability to drive business competitiveness and growth, and is recognized as a leader in environmental sustainability in the region.

Marine & Ocean Energy.

Inflatable Wing for Cargo Ships

Leading mobility company, Michelin, has launched its WISAMO project, a cleantech solution to help decarbonize maritime shipping. [The Wing Sail Mobility \(WISAMO\) project](#) is an automated, telescopic, inflatable wing sail system that can be fitted on both merchant ships and pleasure craft. The system is the product of a collaborative



venture between Michelin Research and Development and two Swiss inventors who share an “all sustainable” vision. The project’s revolutionary design enables a ship to reduce its fuel consumption and thereby have a positive impact by lowering CO2 emissions. The system is installable on most merchant ships and pleasure craft. Especially suitable for roll-on roll-off ships, bulk carriers and oil and gas tankers, it can be fitted as original equipment on newbuilds or retrofitted on in-service vessels. The telescopic mast is retractable, making it easy for a ship to enter harbours and pass under bridges. In all, the system can improve a ship’s fuel efficiency by up to 20 per cent. The WISAMO system will first be fitted on a merchant ship in 2022, when Michelin expects it to go into production following the completion of the trial phase. The project is Michelin’s

contribution to enabling greener, softer, maritime mobility in advance of anticipated future regulations.

Geothermal.

Indonesian Takes Control of Thailand’s Star Energy

A Singapore-based company, Green Era has snapped up a third of Star Energy Thailand, giving Indonesian billionaire Prajogo Pangestu full ownership of its geothermal projects in Indonesia. Green Era, which is controlled by Pangestu, will launch a Southeast Asia renewables asset portfolio to complement its three West Java projects – Wayang Windu Geothermal power plant, Salak Geothermal power plant, and Darajat Geothermal power plant – and will invest US\$2.5 billion to increase its capacity to 1,200 MW by 2028.

Vietnamese Wave Project Planned



South Korean wave energy developer, **ENGINE**, is revealing ambitious growth plans for 2022, plotting further global expansion and new projects to accelerate commercialization. The Seoul-headquartered engineering firm will celebrate its 10th anniversary with strong momentum as it approaches a landmark fifth year of wave energy operation in North-East Asia. Additional international projects include a Vietnamese and Korean initiative in Quang Ngai province involving a five-party consortium: Quang Ngai People’s Committee, **ENGINE**, **SK Innovation**, **Doosan Vina**, and **VinGroup**.

Geothermal Updates.

A US\$700 MILLION GEOTHERMAL power plant in Pagar Alam, South Sumatra, is now in operation. The plant contributes its output to the PT PLN (Persero) Sumatra grid transmission system, the current facility considered a reliable source of clean energy for the next 30 years.

Source: *Marubeni*

THE PHILIPPINES DEPARTMENT of Energy is planning a risk mitigation policy targeted to help encourage investments into geothermal development. The Renewable Energy Management Bureau of DOE is leading efforts to overcome the high capital cost and risk involved, particularly in the early stages of development. The Philippines' geothermal power generation previously led the world in its capacity but fell behind Indonesia in 2018.

Source: *PhilStar*

FILIPINO ICT FIRM, CONVERGE, has secured a geothermal energy contract to power its data center. Converge ICT Solutions Inc. announced last week that it has switched to 100 per cent energy to run its data center in Angeles City, Pampanga, which is owned and operated by its parent company, ComClark Network and Technologies Corp.

Source: *DataCenterDynamics*

KS ORKA THROUGH PT SOKORIA Geothermal Indonesia (SGI) has announced that the Sokoria



geothermal power plant in Ende Regency, East Nusa Tenggara, has achieved its Commercial Operations Date (COD) milestone as of March 2022. This follows 72 hours of Unit Capacity Rate (URC) tests. PLTP Unit 1 of the project has a power generation capacity of 5 MWe.

Source: *GeoEnergy*

PERTAMINA GEOTHERMAL ENERGY (PGE) announced that the company remains open to opportunities for cooperation in developing geothermal power plants with potential partners, to address global warming and decarbonization, citing alliances that can include “co-generation, co-production, and co-development.” Indonesian state

oil and gas giant, Pertamina, is aiming to double its geothermal capacity in the coming years, with an estimated investment of up to US\$4 billion, including the adoption of technology that cuts development costs.

Source: *PT Pertamina*

JAPANESE TRADING COMPANY Sumitomo has acquired the 15 per cent equity stake of ENGIE in the PT Muara Laboh Geothermal Power Project in Indonesia, increasing its stake in the project to 50 per cent.

Source: *GeoEnergy*

Clean Design.



Bladeless Wind Stick Quietly Develops

Located in the rolling hills of Avila, northwest of Madrid, [Vortex Wind Energy](#) is catching wind –and attention – for its inimitable wind energy design: think wind stick, instead of a massive tower with blades – a simple, slender, vertical poll that oscillates and wobbles to gather kinetic energy. The tower

has no gears or brakes, is self-running, standalone, lightweight, uses minimal raw materials, and is harmless to wildlife. Vortex Energy’s Jorge Piñero Ramos tells HUB: “Indonesia and Southeast Asia are fortunate in terms of renewables, since coastal areas are where you can find more

constant winds that are perfect for small wind generators of low maintenance, like Vortex, that can connect all areas on smart grids.” The company was one of the Top 100 Innovators of the Reuters Global Energy Transition Report for 2022.