

Energy Transition and Renewable Energy

Energy transition, Industrial developments, legal issues and outlook



Speakers

Session Chairs

- Vincent Qian Dentons, Beijing; China Working Group Liaison Officer, Asia Pacific Regional Forum
- Nick Dingemans Penningtons Manches Cooper Singapore LLP, Singapore

Panellists

- Maree Myerscough, COO & General Counsel, Asia Pacific Aquila Capital Renewables Asia Pte. Ltd
- Tim Rockell Managing Director, Energy Strat Asia Pte. Ltd.

Agenda

Overview of the Asia Pacific Energy Market and energy transition

Investor viewpoint - the developed markets of Asia Pacific

The view from China

Major trends in the wider Asia Pacific region



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the legal profession®

Tim Rockell

Energy Strat Asia Pte Ltd

Overview of the Asia Pacific Energy
Market and Energy Transition

Tim Rockell, Managing Director



Tim Rockell

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Sectors

Energy, Oil & Gas, Power and
Infrastructure, Trading, Technology

Education, Certifications and Memberships

Fellow of the Energy Institute, UK,
2020

Executive MBA, Ecole des Ponts,
Paris, France, 2001

Diploma in International Business,
University of Bristol, UK, 2001

Member and Diploma holder of
Chartered Institute of Marketing,
Cookham, UK, 1992

BSc (Hons) Physical Sciences,
Oxford Brookes University, Oxford,
UK, 1988

Biography

Tim founded Energy Strat Asia in 2019 to support specialist energy services and technology companies innovate, develop and grow in Singapore and Southeast Asia.

He spent over two decades in KPMG establishing and building the Energy & Natural Resources practice as Global Executive Director. He came to Singapore in 2012 and has relationships with international and national energy companies, government, regulators, industry bodies, academia and financial players.

Industry sector roles include:

- ❑ Management Board Member of the Energy Studies Institute at National University of Singapore
- ❑ Vice Chairman of the Energy Institute (UK) Singapore Branch Committee
- ❑ Chairman of the British Chamber of Commerce's Energy & Utilities Business Committee
- ❑ Committee Member of the Women in Energy, Asia network
- ❑ Board Advisor to Newcastle University (UK) and Research Institute in Singapore
- ❑ MD Singapore & SEA, Valuer.ai, Denmark

Tim has strong interest in urban infrastructure development, mobility and energy transition pathways. He has project experience in strategy, risk, M&A advisory and management consulting.

He is a regular participant at the Singapore Energy Summit at the Singapore International Energy Week, hosting the regulatory session in 2019 and the Low Carbon Economy panel session and COP26 ThinkTank Roundtable in 2020 and Regional Interconnectivity, Technology, Asian Downstream Summit and COP26 ThinkTank Roundtables in 2021.

Tim moderated the ASEAN energy dialogue series with the International Energy Agency's Executive Director. He is a regular panellist on diversity & inclusion roundtables.



AGENDA

- APAC Overview
- Headlines
- Solar Energy Trend
- Wind Energy Trend
- Energy Storage Trend
- Electric Vehicle Trend
- Summary of key trends

APAC OVERVIEW



Installed capacity

- Hydro Power – 413.5 GW
- Solar Power – 392.6 GW
- Wind Power – 365.4 GW
- Nuclear Power – 55.5 GW

Forms ~42.9% of total electricity capacity



Installed capacity

- Solar Power – 61.62 GW
- Wind Power – 41.84 GW
- Bio Power – 10.7 GW
- Hydro Power – 4.92 GW

Forms ~31.5% of total electricity capacity



Installed capacity

- Hydro Power – 54.83 GW
- Solar Power – 24.05 GW
- Bio Power – 8.65 GW
- Wind Power – 6.22 GW

Forms ~15.1% - 81.9% of total electricity capacity



Installed capacity

- Wind Power – 8.82 GW
- Hydro Power – 7.99 GW
- Solar Power – 5.20 GW
- Bio Power – 0.62 GW

Forms ~42.6% of total electricity capacity



Installed capacity

- Solar Power – 22.87 GW
- Wind Power – 8.95 GW
- Hydro Power – 8.52 GW
- Bio Power – 0.88 GW

Forms ~77.9% of total electricity capacity



ASEAN Energy Outlook 2050

ASEAN DEEPER DIVE

In line with rapid economic growth, energy demand in the region is expected to triple by 2050 under the Baseline Scenario. Total final energy consumption (TFEC) is expected to reach 473.1 Mtoe in 2025 and 1,281.7 Mtoe in 2050.

- Fossil fuels are projected to continue to supply most of the regional energy demand, with oil accounting for 47.4% of TFEC, followed by electricity (20.3%), coal (14.5%), and bioenergy (9.2%).
- Cooking and cooling will remain the primary energy use in the residential sector, making up about 80% of the sector's demand.
- Petroleum remains the primary energy source in the transport sector (accounting for 91% of sectoral energy consumption in 2050), and transport remains one of the highest energy-consuming sectors in the region.

The Total Primary Energy Supply (TPES) is expected to grow by a factor of about 3.7, from 653 Mtoe in 2020 to 2,648 Mtoe in 2050.

- Natural gas, oil and coal dominate the region's energy supply, accounting for about 88% of TPES in 2050, leaving renewables at 11.9%. In the medium term, without policy interventions, the region is projected to reach renewable energy (RE) share of only 14.4% of the TPES by 2025, little changed from the 2020 value of 14.2% and falling short of the APAEC RE target (23% of the TPES by 2025).

Without significant discoveries or additions to existing production infrastructure and with the expected rate of utilisation of fossil fuels, ASEAN is projected to become a net importer of natural gas by 2025 and coal by 2039.

- ASEAN electricity generation is expected to increase threefold by 2050 from the 2020 level, reaching 3,388 TWh in that year. Electricity generation capacity reaches 959 GW in 2050 and consists mainly of coal (33.8%), natural gas (26.1%), and hydropower (21.6%), following the region's historical dispatch.



Installed capacity

- Hydro Power – 54.83 GW
 - Solar Power – 24.05 GW
 - Bio Power – 8.65 GW
 - Wind Power – 6.22 GW
- Forms ~15.1% - 81.9% of total electricity capacity



RECENT ACTIVITIES

Singapore has formally launched its national hydrogen strategy on 25th October 2022 as the low-carbon fuel that could meet 50% of Singapore's power needs by 2050 - SIEW 2022

SOUTHEAST ASIA'S LARGEST ENERGY STORAGE SYSTEM OPENS ON JURONG ISLAND IN PUSH FOR SOLAR POWER

[Channel News Asia, 2 Feb 2023](#)

- Its rapid response time to store and supply power in milliseconds is essential in mitigating solar intermittency caused by changing weather conditions in Singapore's tropical climate
- Singapore aims to increase solar capacity to at least 2 gigawatt-peak (2 GWp) by 2030, equivalent to powering about 350,000 households a year

Vietnam in talks with Sembcorp to build power line linking to Singapore

[Reuters, 10 Feb 2023](#)

- Sembcorp Utilities and a unit of Vietnam's state oil firm PetroVietnam on Friday also reached an agreement to develop offshore wind projects to export electricity to Singapore, the government said in a statement, without elaborating.
- PetroVietnam said the agreement would pave the way for the companies to develop wind farms with a combined capacity of 2.3 gigawatts by 2030.



RECENT ACTIVITIES

RENEWABLE ENERGY: WHAT CHINA IS DOING ON SOLAR AND WIND POWER STORAGE TO SECURE SUPPLY AMID WEATHER CHALLENGES

South China Morning Post, 29 Jan 2023

- China is fast-tracking its wind and solar capacity in the current five-year plan ending 2025, likely to hit its 2030 target ahead of time
- Focus on developing Long Energy Duration Storage (LDES) capabilities to cope with fluctuation in energy production due to climate change



INDIA'S GREEN ENERGY FOCUS IN SYNC WITH ONGOING G20 PRESIDENCY

The Economic Times, 4 Feb 2023

- The government announced an outlay of USD 250m for the recently launched National Hydrogen Green Mission
- It has a target of the annual production of 500 MMT (5 million metric tonnes) of green hydrogen by 2030

India Energy Week News, 7 Feb 2023

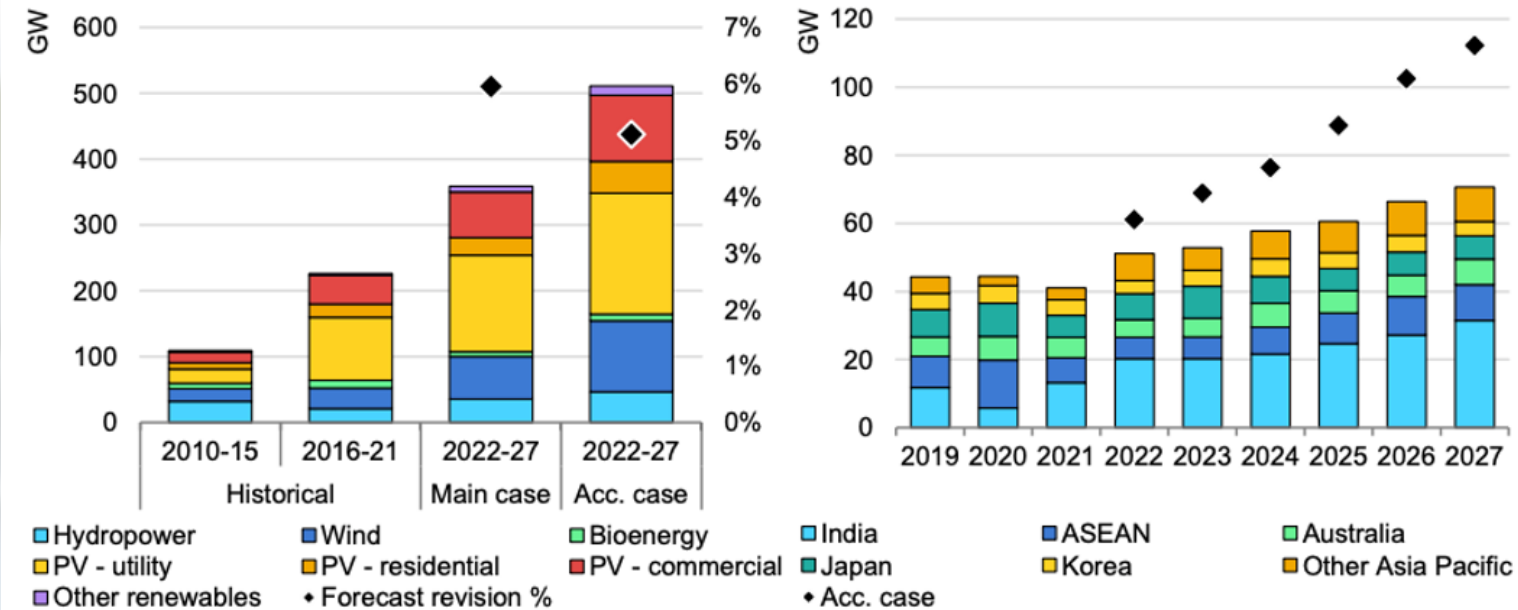
- Modi: India's rising prowess as an energy transition powerhouse – officially launched E20 a 20% blend of ethanol with petrol



TRENDS IN APAC

SOLAR ENERGY

Figure 1.25 Asia Pacific renewable capacity additions by technology, 2010-2027 (left) and annual capacity additions by country, 2019-2027 (right)



IEA. CC BY 4.0.

Notes: Acc. case = accelerated case. ASEAN = Association of Southeast Asian Nations. Asia Pacific excludes China.

Renewable capacity in the Asia Pacific region (excluding China) is expected to grow by 360 GW (+70%) over 2022-2027.

Solar PV accounts for over two-thirds of renewable deployment.



TRENDS IN APAC

WIND ENERGY

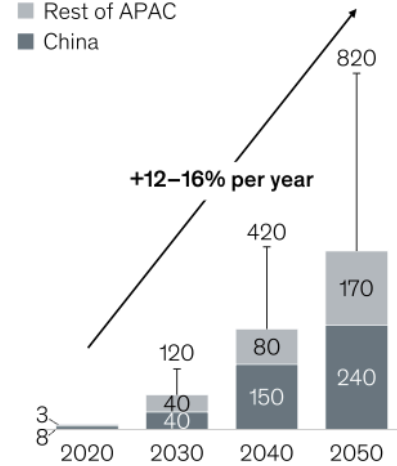
The offshore wind market is expected to grow significantly, with the Asia–Pacific region showing the greatest long-term growth potential.

Installed capacities, gigawatts (GW), 2021 base case¹

┆ 2021 accelerated case²

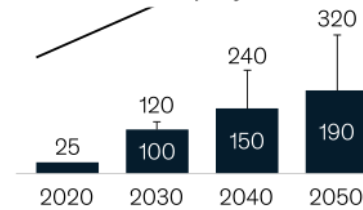
Asia–Pacific (APAC)

- Rest of APAC
- China



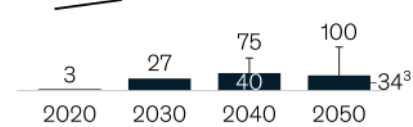
Europe, Middle East, and Africa (EMEA)

+7–9% per year



Americas

+9–13% per year



Note: APAC includes OECD Asia–Pacific and non-OECD Asia; EMEA includes OECD Europe, Eurasia, Middle East, and Africa; Americas includes OECD Americas and Latin America.

¹ McKinsey's view on current path of energy transition without major shifts in production and consumption compared to today.

² McKinsey's view on an accelerated energy transition, including several conceivable shifts in production and consumption compared to today.

³ Capacity decrease due to forecasted decommissions.

Source: McKinsey Global Energy Perspective 2021

The Asia–Pacific region (APAC), which had 11 GW of installed offshore wind in 2020, is projected to strongly increase its capacity, surpassing Europe, the Middle East, and Africa (EMEA) by the mid-2030s

Source: McKinsey and Co



Offshore Wind Overview| APAC

Key Countries

Taiwan:

5.5GW by 2025, 15.5GW by 2035

- Local content rules for Round 3 tender: 60%
- 9 projects awaiting EIA to take part, results 2023

Japan:

10 GW by 2030, 30-45GW by 2040

- Third auction launched Happo-Noshiro, 356MW

South Korea:

12GW by 2030

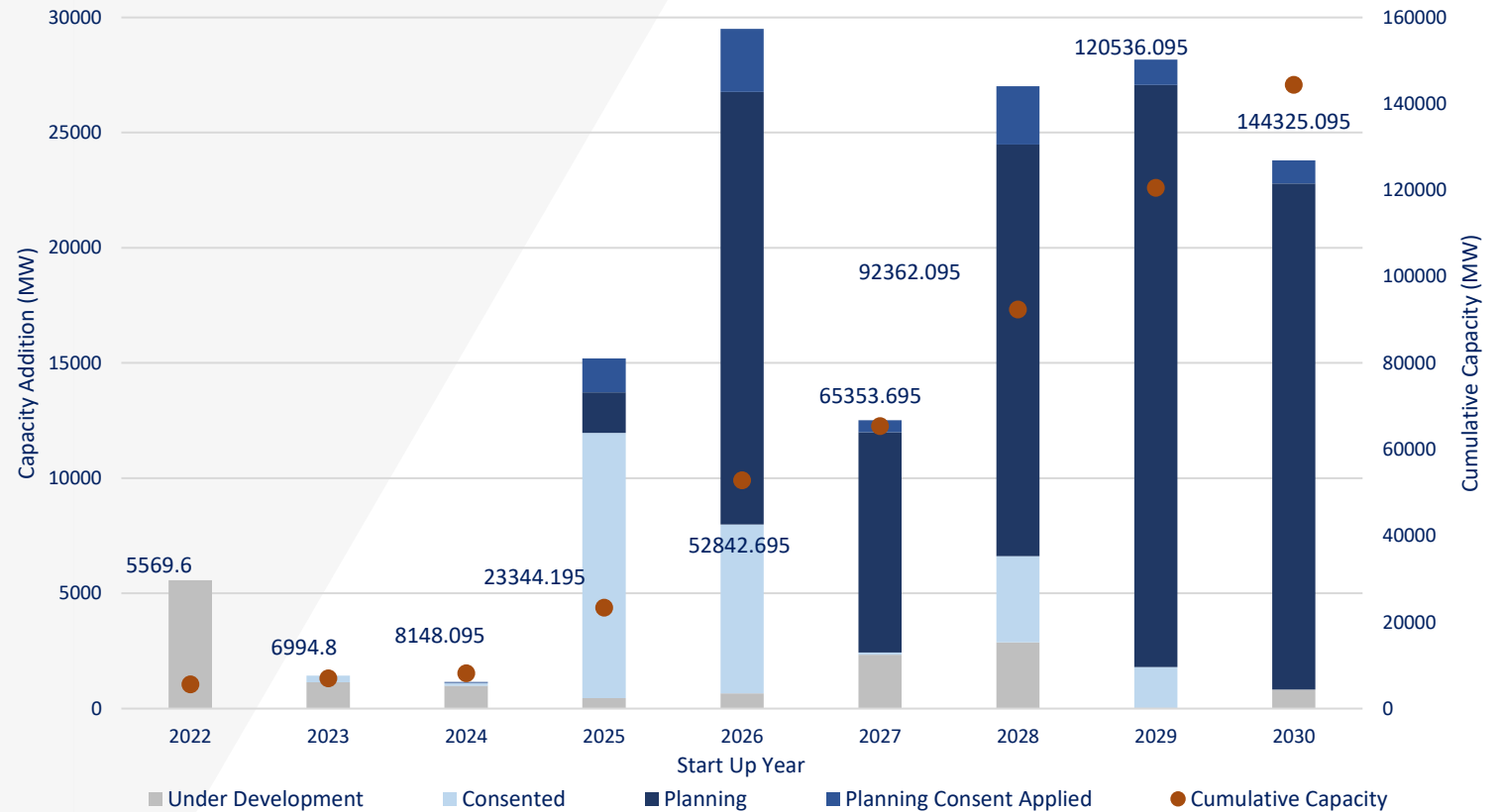
- Large early-stage pipeline
- Floating drive from international players

Vietnam:

5GW by 2030

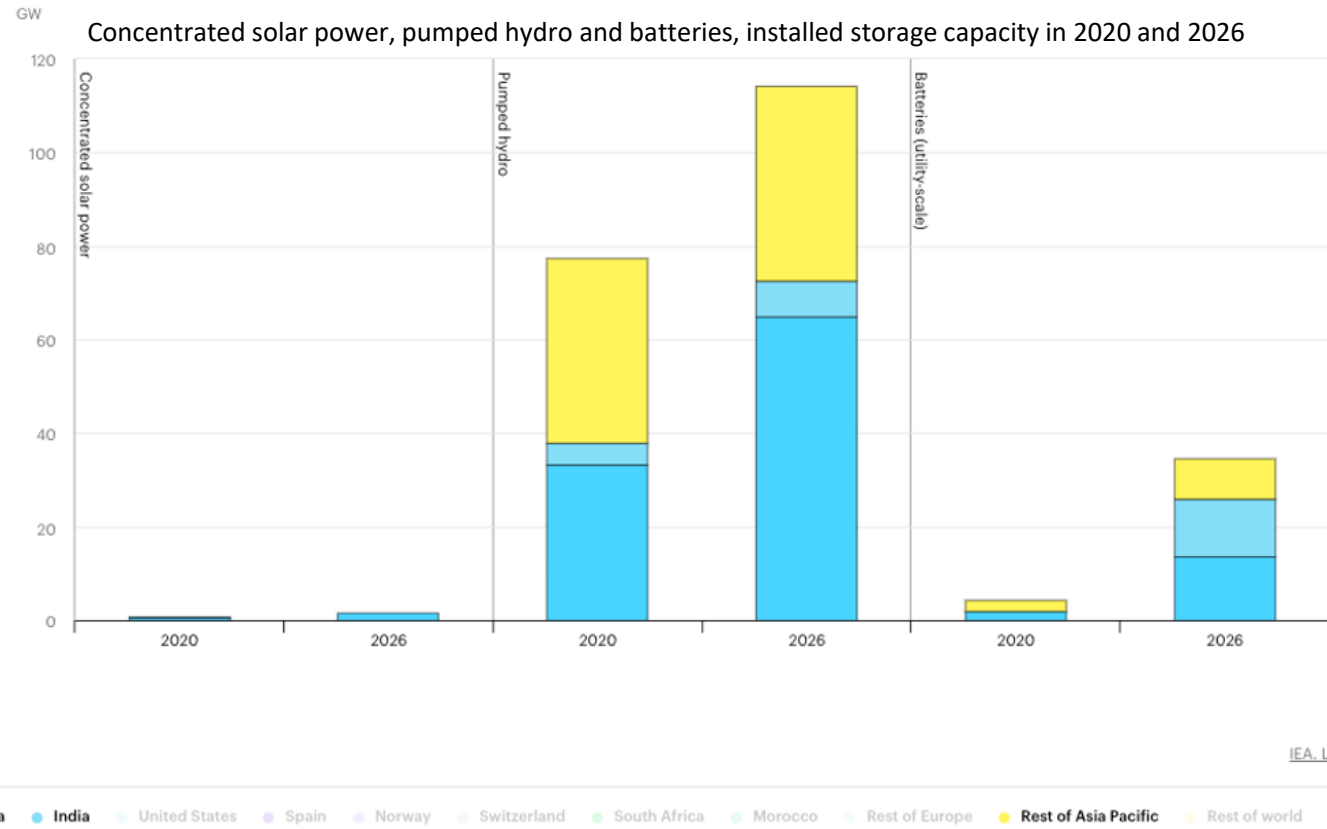
- Target expected to increase

Asia-Pacific Capacity Pipeline up to 2030 (excluding China)



TRENDS IN APAC

ENERGY STORAGE



Installed storage capacity in APAC is forecast to expand over the next few years.

The main driver is the increasing need for system flexibility and storage to fully utilise and integrate larger shares of variable renewable energy (VRE) into power systems.

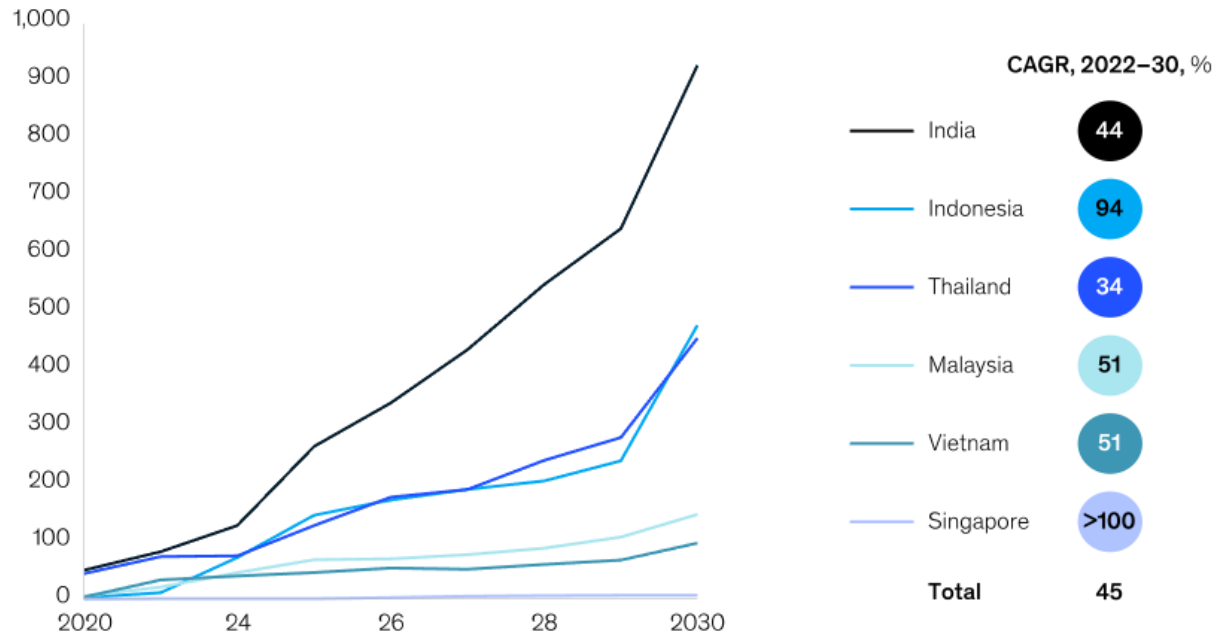
Source: IEA

TRENDS IN APAC

ELECTRIC VEHICLES

Production of electric four-wheelers (E4Ws) is forecast to grow at a robust rate of 45 percent in emerging Asia.

E4W production in selected countries, thousands of vehicles



Source: IHS Markit Light Vehicle Powertrain and Alternative Propulsion Forecast Model; McKinsey analysis

Source: HIS and McKinsey and Co

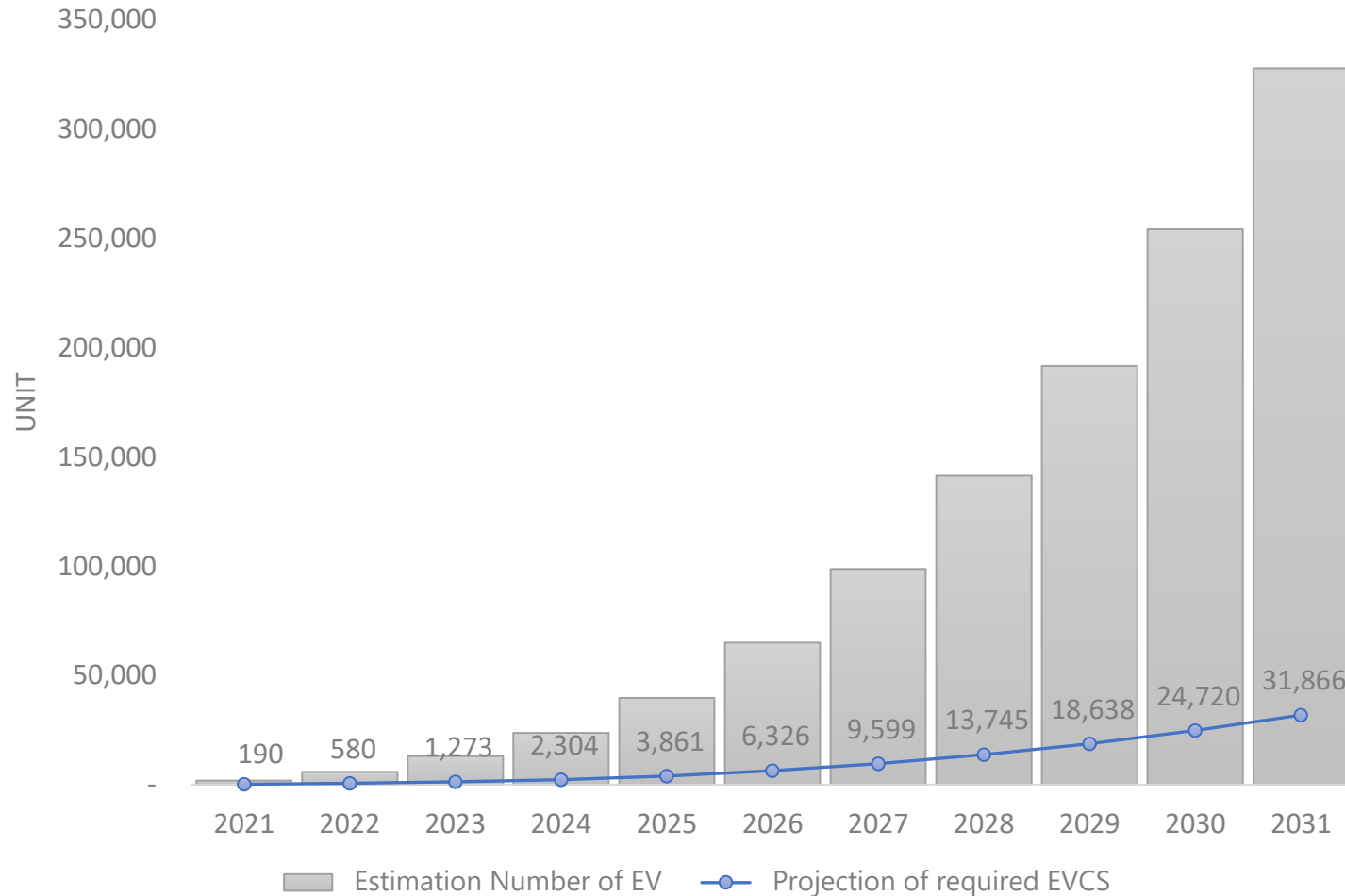
In emerging Asia, production of E4Ws will pick up rapidly.

Thailand and Indonesia are already major regional automotive production hubs in ASEAN.

E4W production will scale rapidly from low levels to a significant share in these markets, growing at a combined 45 percent.

Tim Rockell

Estimated Demand Growth of EVCS and EV to 2031 in Indonesia



KEY POINTS

Estimation of EVCS point needed per year with ratio 10 EV : 1 EVCS

Estimation also take into account the *Fast Charging* and *Medium Charging Level*

The estimation include the national requirement that provided by PLN or other Parties

Some of the benefit of EV implementation including:

Reduce Oil Import

50k of EV shall reduce IDR 1 Trillion/year of oil expenditure

Reduce Emission

EV car emission equivalent to 30% of ICE Car Emission

Low Operational Cost

EV operational cost is 1/5 of ICE operational cost

SUMMARY OF KEY TRENDS

1

Installed capacity for Solar and Wind energy will continue to rise
Fossil fuels won't disappear

2

Energy storage development and capacity will continue to rise.
Grid connectivity increasing

3

Electric vehicle production and adoption rates are forecast to increase.
Charging Networks pace an issue

4

Greater shift of Electricity generation from renewable energy sources including biofuels and hydrogen





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Maree Myerscough

Aquila Capital Renewables Asia

Investor viewpoint - the developed markets of Asia Pacific



Maree Myerscough

COO & General Counsel

Aquila Clean Energy Asia Pacific

Maree Myerscough is the COO & General Counsel of Aquila Clean Energy Asia Pacific (ACE APAC), a clean energy platform that funds, develops, builds and operates clean energy assets across the region. In her capacity as COO & General Counsel, Maree is responsible for leading ACE APAC's operations and legal affairs. ACE APAC is part of Aquila Capital, a sustainable investment and asset development company focused on generating and managing essential assets on behalf of its clients.

Prior to joining Aquila, Maree led legal affairs in Asia Pacific for Conergy, which involved establishing and growing the function for the region. As part of the senior management team, she provided strategic advice and counsel including guiding the team through two M&A processes. Other prior roles included in-house counsel at Sun Edison where she advised on renewable energy project financing transactions and her work in private practice with Latham & Watkins in Singapore and Mallesons in Sydney where she gained extensive transactional, finance, corporate and commercial experience.

Maree holds a BA and LLB from University of Wollongong and serves as a board member for the Association of Corporate Counsel (ACC) in Singapore.

About Aquila Capital

Aquila Capital is an investment and asset development company focused on generating and managing essential assets on behalf of its clients.

Aquila Capital

Owner-managed, founded in 2001 in Hamburg. Own fully BaFin regulated KVG

Employees

Around **630** employees
16 locations in
15 countries

Assets under management

We manage around
EUR 13.2 bn on behalf of
institutional investors worldwide

Diversity

48 different nationalities
46% female employees

Clean energy

11.9 GW clean energy capacity
from wind, solar PV and
hydropower plants. Active in
energy storage and energy
efficiency

Infrastructure portfolio

1.9m square metres
of real estate and green logistics
projects completed or under
development



Source: Aquila Capital Investmentgesellschaft mbH, as at 30.06.2022.

Asia Pacific: Target markets



*Source: Wood Mackenzie
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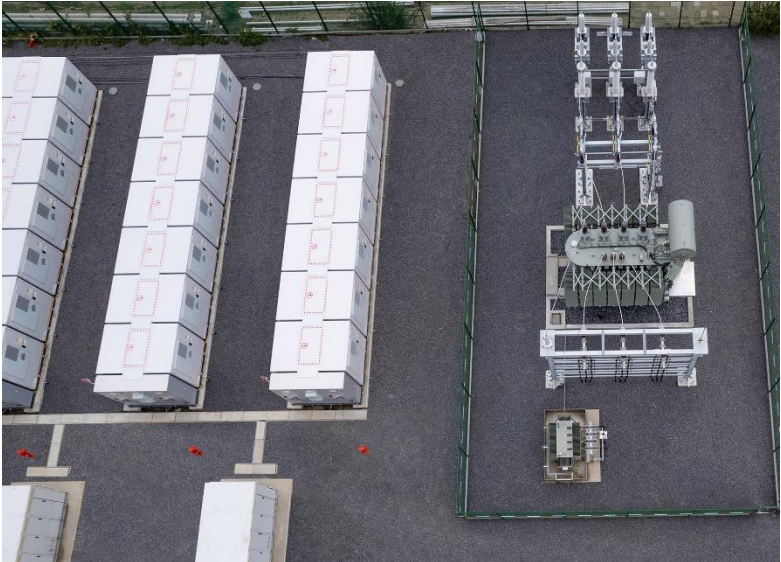
The clean energy technologies we invest in APAC



Tabernas solar park, Spain



Desfina Wind farm, Greece



Kairos Battery Energy Storage System, Belgium

Challenges & Trends



Grid connectivity & infrastructure



Hybrid solutions



PPAs



Regulatory environment



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Vincent Qian Dentons

The view from China

钱学凯

高级合伙人

大成律师事务所

执业领域：矿业与自然资源，公司并购重组，跨境投资与贸易，
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For presentation on occasion of:
7th IBA Asia Pacific Forum Biennial Conference RE Session
Singapore
February 24, 2023



Vincent Qian

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China Renewable Energies

-Opportunities in the Context of Climate Change and Energy Transition

- **The Rise of Renewable Energy in China**
 - The Latest RE Statistics
 - RE Industry Market Change Trends
 - Challenges Facing the Renewable Energy Industry
- **Opportunities in the Context of Climate Change and Energy Transition**
 - China Ambitious Carbon Emission Reduction Goals and Action Plans
 - Renewable Energy as China's Development Strategy
 - Industrial Opportunities of Renewable Energies
- **New Opportunities for Legal Professionals**

The Rise of Renewable Energy in China

Solar energy



Geothermal energy



Wind energy

Biomass energy

Hydro-energy



Renewable Energy Developments in China

New installed capacity in 2022: 152GW

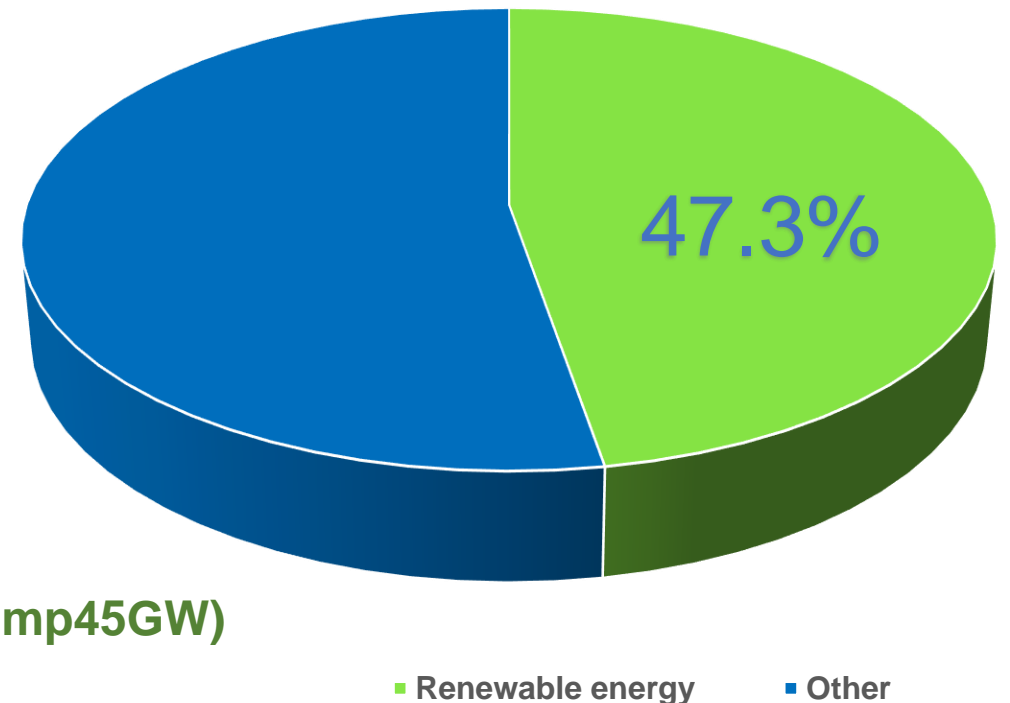
- Photovoltaic: 87.41GW
- Wind: 37.63GW
- Hydropower: 15.95GW
- Biomass:3.34GW

RE: 1213 GW, 47.3%

Including:

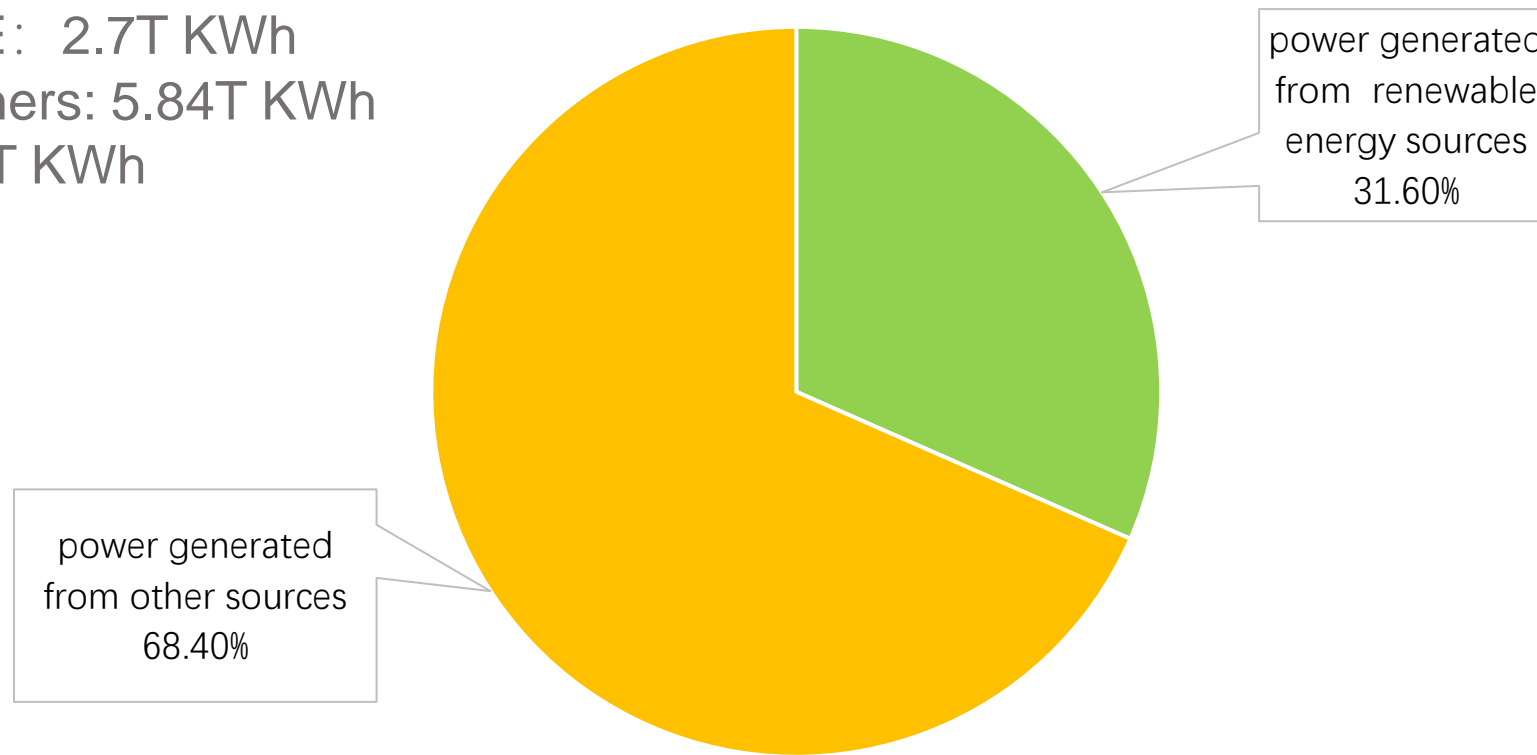
Wind power	365 GW
Photovoltaic power	393 GW
Hydropower	413 GW(conventional 368GW, pump45GW)
Biomass power	41 GW

Installed capacity

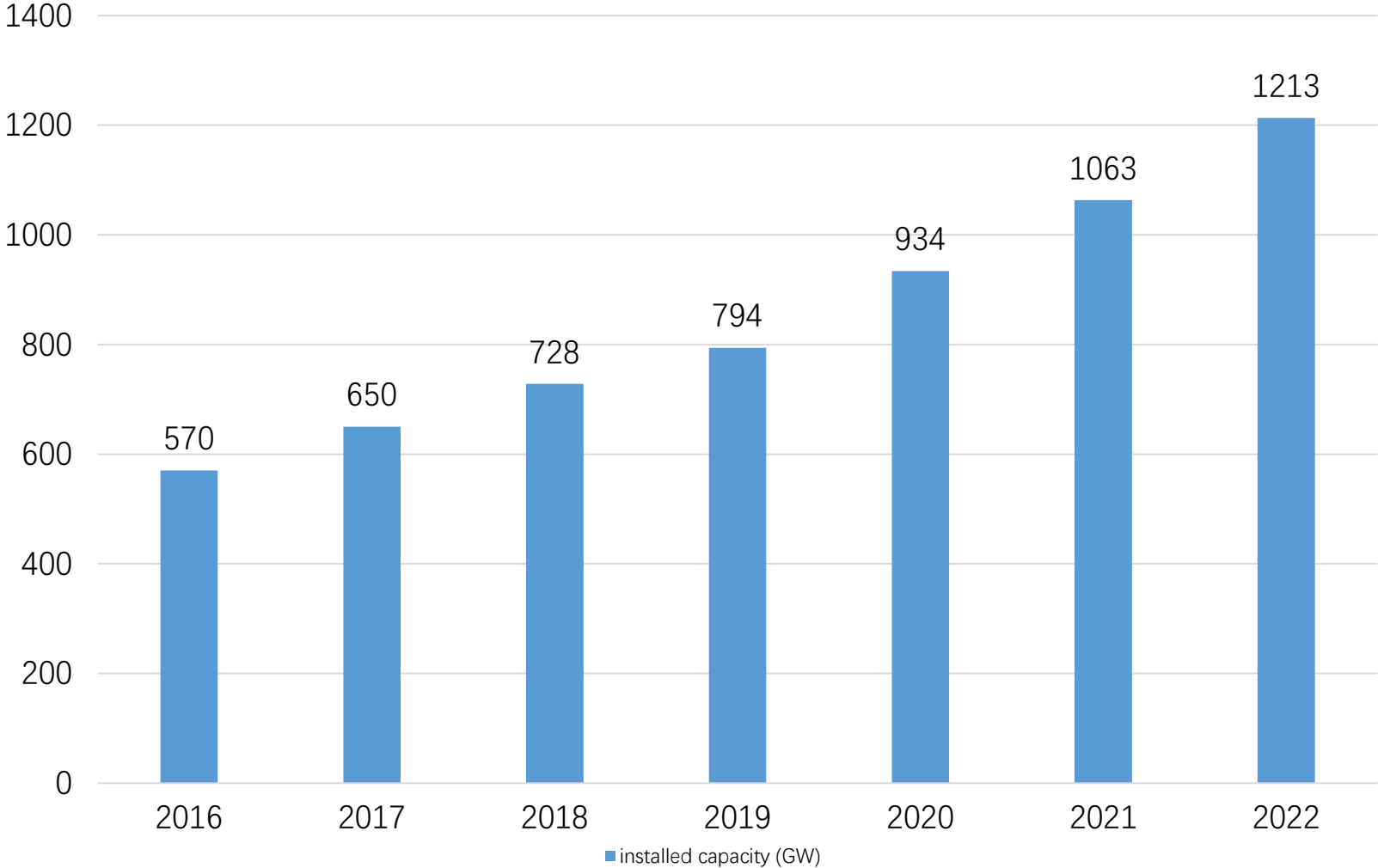


China RE Electricity Generated Accounts for 31.60% at 2.7T KWh in 2022

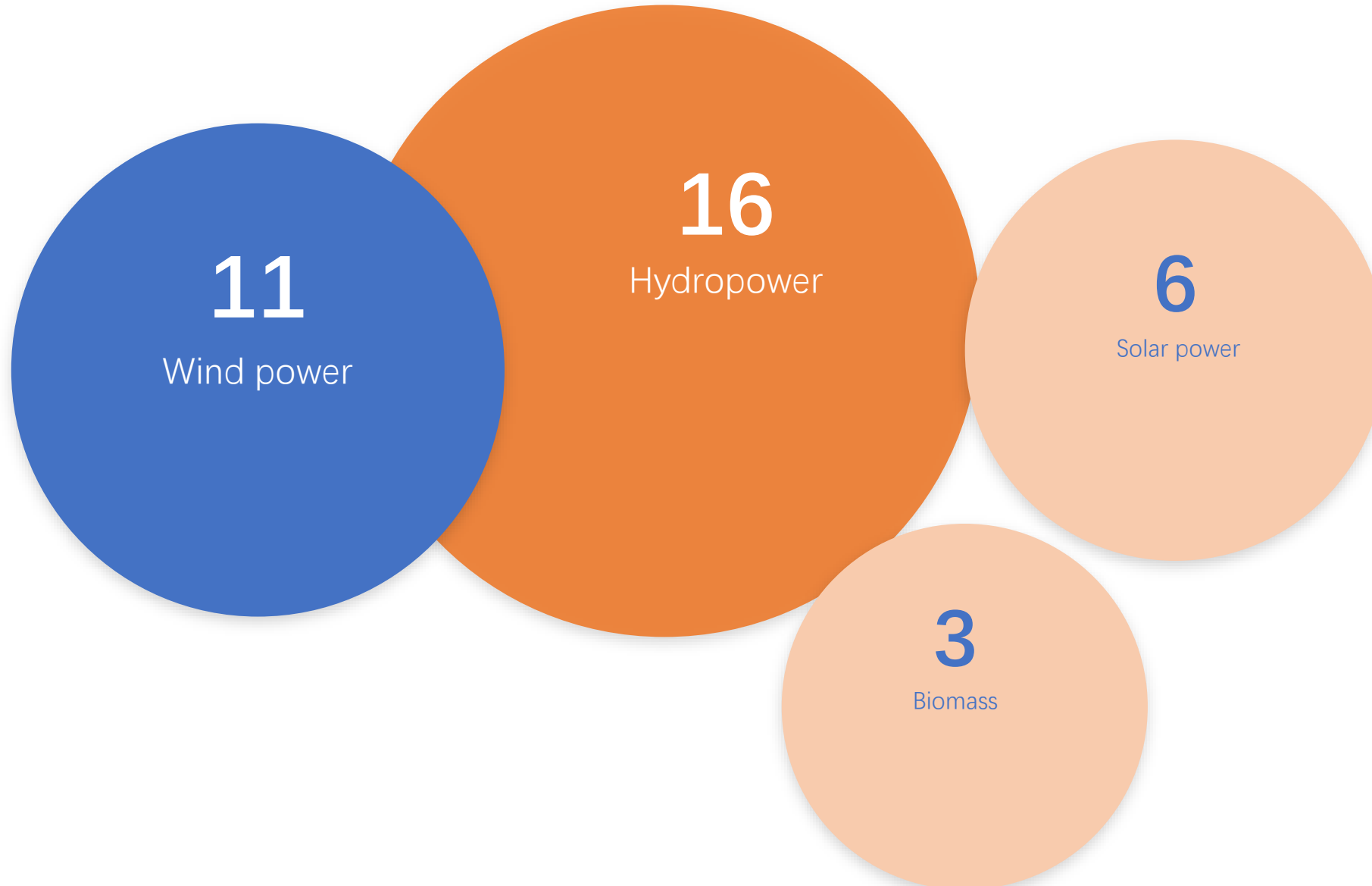
Power of RE: 2.7T KWh
Power of others: 5.84T KWh
Total: 8.544T KWh



Renewable Energy Installed Capacity in China between 2016-2022



Years China Being the World Leader of RE (as in 2020)



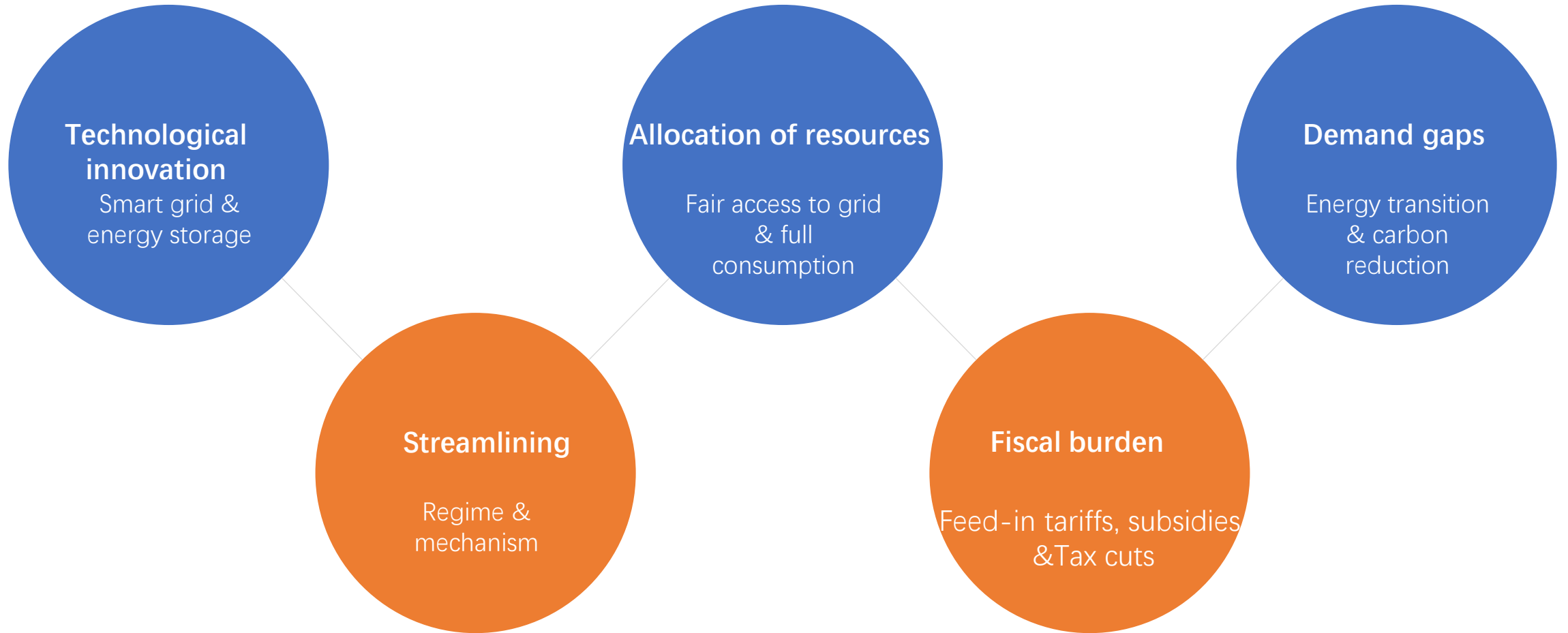
China RE Industrial Market Change Trends

1. The RE market becomes more competitive and concentrated, but new comers are entering one after another
2. Installed capacity has been increasing while M&A became more active recently
3. More RE investments from traditional energy enterprises (such as coal power to solar power)
4. The energy strorage technology is developing fast but CCUS needs more time to go
5. Stepping into the age of normal feed-in tariffs
6. Benefit by manufacturing and engineering constructing capacity, Chinese RE investors participated in glabal RE market aggresively

Solar panels, wind turbines and gearboxes account for 70% of global market value;
carbon reduction reaches 2.26 bn tons driving foreign emission reduction of 573 M tons
accounting for 41% of world carbon reduction -NEA News release Jan13, 2023

Challenges Facing China RE Industry

-from regulator's perspective



Major Risks That Should Keep Alert by RE Investors in China



subsidies & feed-in
tariffs



Approval & filing, RE
development plan &
list of subsidy
coverage



Limited land access,
ecological red line,
natural reserves

The '3060' Goals

--Reaching peak emissions before 2030 and trying carbon neutrality by 2060

By the end of 2025, non-fossil energy consumption shall be around 20%;

Carbon peaks at 2030: carbon dioxides emissions decrease more than 65% per capita as compared with that of 2005; non-fossil energy consumption shall be around 25%; wind and solar power installation capacity shall be more than 1.2bn Kw

Carbon neutral at 2060: Non-fossil energy consumption shall be more than 80 percent.

The 14th Five-Year Plan for Renewable Energy Development

- **Total renewable energy**

- total renewable energy consumption will reach about 1 billion tons of standard coal by 2025. Renewable energy accounted for more than 50% of the increase in primary energy consumption

- **Renewable energy power generation target**

- by 2025, the annual power generation of renewable energy will reach about 3.3 trillion kWh. The increment of renewable energy power generation shall account for more than 50% of the increment of electricity consumption of the whole society, and the power generation of wind power and solar energy shall be doubled

- **Renewable energy power consumption target**

- in 2025, the national total renewable energy power consumption responsibility weight will reach about 33%, the renewable energy power non-hydropower consumption responsibility weight will reach about 18%

- **Non-electric utilization target of renewable energy**

- in 2025, the scale of non-electric utilization such as geothermal energy heating, biomass heating, biomass fuel and solar energy thermal utilization will reach more than 60 million tons of standard coal

Renewable Energy Development Promotion Policy

No.	Date	Name	Main Content
1	Published 2021.10.21	The 14th Five-Year Plan for Renewable Energy Development	<p>Ⅲ. To optimize the mode of development and develop renewable energy on a large scale</p> <ol style="list-style-type: none"> 1. To promote the development of wind and photovoltaic power generation base 2. To promote distributed development of wind power and photovoltaic power generation 3. To promote the integrated development of water, wind and solar comprehensive bases 4. To steadily promote the diversified development of biomass energy 5. To actively promote large-scale development of geothermal energy 6. To steadily advance the demonstration development of Marine energy
			<p>Ⅷ. Supporting measures</p> <ol style="list-style-type: none"> 1. To improve the evaluation and service system for renewable energy resources 2. To strengthen land and environmental support for renewable energy 3. To strengthen fiscal policy support for renewable energy 4. To improve the green finance system for renewable energy

Supportive Measures for RE Industrial Developments

- Renewal energy enjoys various supports and subsidies from the government
- For wind power, solar power, biomass and other renewable projects, owners of the projects may obtain price subsidies, land acquisition supports and discounts, cash grants, tax deductions, etc.
- The NDRC at the central government level recently issued three policy guidelines, respective on the price and price subsidies for wind power (2019), solar power (2019) and new energy in general (2021). Many provincial governments have their own support and subsidy policy.
- Carbon emission rights trading and other carbon finance tools will play more important role in promoting RE development



New Opportunities for Legal Professionals

- New technology and new financing required for the renewable energy industry: photovoltaic, wind power, smart grid, energy storage technology, etc.
- New investments and new M&A in the renewable energy industry: The rush of the SOEs to march into renewable energy industries
- Structuring and qualifying programs for attaining subsidies
- ESG disclosure
- China outbound investments in RE industry



New Opportunities for Legal Professionals (cont'd)

--Carbon Finance

Capping carbon emission for Key Emission Sectors:

-power generation, building materials, steel, non-ferrous metal, petro-chemical, chemical, paper mill, and civil aviation

Capping carbon emission for Key Emission Entities (KEEs)

KEEs are allowed to purchase CER to offset a maximum of 5% carbon emissions

Seven carbon credits trading markets established

Trading of Green Power Certificates also available



Thank you

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Nick Dingemans

Penningtons Manches Cooper

Major trends in the wider Asia

Pacific region



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Nick advises clients on corporate mergers and acquisitions as well as on commercial matters. He has particular experience in advising on cross-border and emerging market transactions in the energy, natural resources and infrastructure sectors.

These include acquisitions, disposals, corporate restructurings and joint ventures in oil and gas, LNG, solar, wind and conventional power as well as mining and commodities. Nick has also advised clients on a wide range of mergers and acquisitions in other sectors including shipping, technology and financial services.

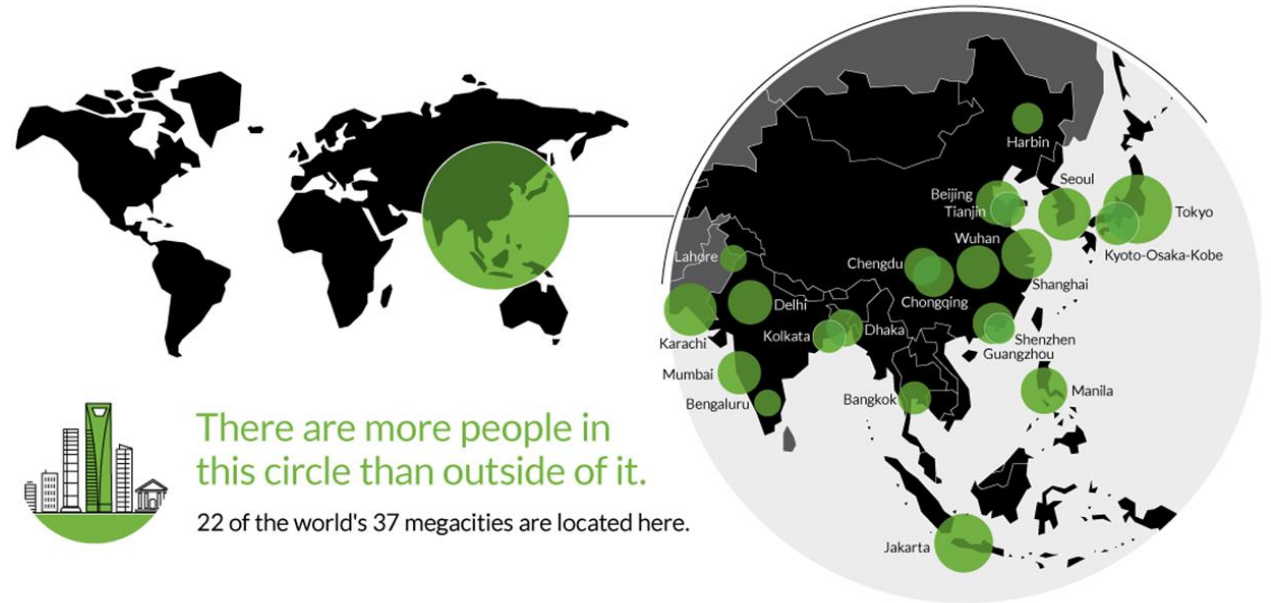
Nick is praised by Chambers Global for his 'commercial understanding and industry knowledge' while The Legal 500 describes him as 'an exceptional corporate lawyer.'

Nick Dingemans
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Key Trends

- Energy Trilemma
- Approach to Net Zero
- Carbon Markets
- Hydrogen Economy
- Carbon Capture and Storage



Energy Trilemma

“...the need to find balance between energy reliability, affordability, and sustainability and its impact on everyday lives...

...the challenges faced by businesses, organisations and individuals in balancing these 3 core elements is vital to achieving goals such as Net Zero.”

- **Reliability:**
 - Security of supply
 - Impact of Ukraine
- **Affordability:**
 - A just transition
 - Cost of Energy
- **Sustainability:**
 - Impact of decisions made for Reliability and Affordability on ESG
 - Long term ability to supply

Paris Agreement and Net Zero Legal Commitments

Indonesia:
2060
(Declaration)

Malaysia:
2050
(Declaration)

Singapore:
2050 (Policy
Document)

China: 2060
(Policy
Document)

Vietnam: 2050
(Declaration)

India: 2070
(Declaration)

CONCLUSIONS:

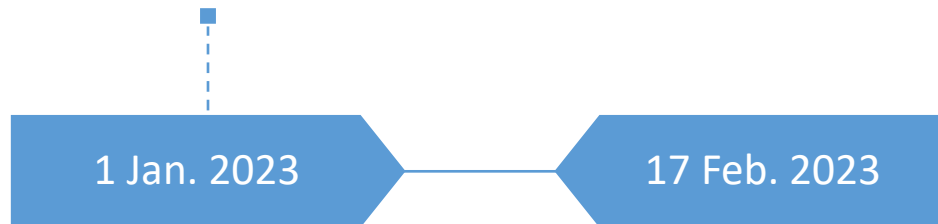
Energy Transition will accelerate as intent terms to legal certainty

Legal Status of Net Zero Commitments likely to become binding legal commitments

Business must start its own transition

Carbon Markets

From 1 Jan 2023 EU effectively established a carbon border tax with addition of Shipping and Aviation to its Emissions Trading Scheme (Cap and Trade scheme)



As of 17 Feb 2023 EU Carbon Permit price was Euro 100.69 (approx. USD 107.62) per tonne.

- Singapore (Industrial facilities): Carbon Pricing Act – set price at SGD 5 per tonne with progressive increases to S\$50-80 per tonne by 2030
- China (Power): launched its ETS in July 2021. Market price moved from 48 CNY/t (~USD7) to a maximum of 61 CNY/t (~USD8.90).
- Malaysia: No carbon tax/ETS. Voluntary market established in 2022.
- Indonesia: No market at this stage. Tax of USD 2.10 per tonne (Coal fired power). Legislation being discussed for carbon price and markets.
- Vietnam: Law enacted. Market priced ETS from 2025
- India: No Carbon price. Empowering legislation enacted December 2022. Market to commence during 2023

Why Hydrogen?

- Hydrogen does not exist freely in nature and is only produced from other sources of energy, it is known as an energy carrier.
- It is a clean-burning fuel, and when combined with oxygen in a fuel cell, hydrogen produces heat and electricity with only water vapor as a by-product.
- Hydrogen can be used to decarbonise industrial processes that are hard to decarbonise by electrification or other means
- The hydrogen rainbow is a handy tool, used within the energy industry, which can be used to decipher the kaleidoscope of hydrogen sources based on the production used and the emissions created in the process.

Hydrogen Value Chain

- Hydrogen can be locally produced (e.g. Green Hydrogen from renewable power; Blue Hydrogen from hydrocarbons with CCUS; Pink hydrogen from nuclear power).
- Many Countries now have a Hydrogen Strategy:
 - China; Korea; Japan; Australia; New Zealand; Singapore
 - Use case for Hydrogen rapidly developing in mobility (fork lifts and long distance trucking), industry (cement, fertiliser), shipping (ammonia) and aviation (AirBus Hy 2035 plan)
- Development of a hydrogen economy needs new infrastructure; new markets and new regulations



Carbon Capture Utilisation and Storage

- CCUS provides a physical tool to reduce carbon emissions (e.g. CO₂ from Power) and also to support Direct Air Capture
- Capture Carbon at source + Utilise OR Store (sequester) permanently in depleted petroleum reservoirs or saline aquifers
- Market:
 - Carbon price creates the financial incentive to reduce emissions
 - Ability to earn and sell Carbon Credits through abatement is further incentive
- Cross Border CCUS: creates many potential issues. Regulatory framework and a cross border treaty required
- Regulatory Certain needed for Cross Border structures:
 - London Protocol
 - Impact on NDC on each state
 - Monitoring, Verification and Report
 - Liability Regime
 - Fiscal Stability



First commercial Direct Air Capture Plant (DAC) in Iceland



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