

### ***China's new found energy source***

- On 22 October 2019, China achieved the world's first breakthrough in extracting scalable quantities of ***methane hydrates*** ("inflammable ice").
- Methane hydrates are a lot less polluting but ***ten times more energy- rich per unit*** compared to coal, oil, and natural gas.
- ***Global reserve*** of methane hydrates is 2X all other known fossil fuels combined, ***enough for 1,000 years*** of human consumption.
- China's gas hydrates reserve is estimated at ***100 billion tons of oil-equivalents***, of which ***80% lies in the South China Sea***.

### ***World Energy Scenario 2019, World Energy Council***

- ***Fossil fuels over 2/3*** of global primary energy in 2040. ***Coal's contribution giving way to gas. Oil demand peaks between 2025 and 2030.***
- ***Central Asia (including India) is the largest driver of primary energy demand growth, while East Asia (including China) succeeds in curbing growth*** in all scenarios
- ***By 2040, 20-31% of the energy system will be electrified*** - mix increasingly ***shifts towards renewable sources from 26% of total power generation in 2020 to 33-43%***
- ***Hydrogen and CCUS (Carbon Capture, Utilization and Storage)***

***A better path for Africa's energy future, 19 February, 2018*** Rachel Kyte, Former CEO and Special Representative of the UN Secretary-General for Sustainable Energy for All

- ***Solar and wind energy costs*** plummeting, as are the costs of storage
- More commitments by African leaders, e.g. ***Ethiopia, Ghana, Rwanda, Senegal and Zambia***, to making ***reliable, affordable and clean energy available to all***, especially remote and marginalized populations.
- Financial innovation backing clean energy growth and development, such as Nigeria's first-ever ***green bonds*** and the African Development Bank's new lending for ***off-grid electricity and partnerships***.

- *Integration of both centralized and decentralized energy sources*
- *Power purchase agreements (PPAs) with transparent processes to attract long-term investors in grid connected renewables.*
- *Subsidize clean energy for the poorest - clean cooking fuels and electricity – Morocco to Malawi - renewable energy, energy efficiency and greater energy access.*

***International Renewable Energy Agency (IRENA)- Africa 2030: Roadmap for a Renewable Energy Future (October, 2015)***

- *Africa's energy requirements expected to double/triple by 2030*
- *Plentiful renewable energy sources to meet 22% of energy needs by 2030 (2013 level of 5%)*
- *Biomass for cooking, hydro, wind and solar*
- *Regional cooperation – regulation, infrastructure, access*

***Global Energy System based on 100% Renewable Energy, Energy Watch Group and LUT University, Finland – 12 April, 2019 –***

- *100% renewables for Africa possible by 2050*

***Evaluating Africa's largest hydropower projects, Hydro Review, 8.6.18 (the Grand Ethiopian Renaissance Dam (GERD), and the DRC's Grand Inga Dam)***

- *Colonial-era cross-border tributary rights of the Nile hamper the Ethiopian project whereas the Congo River is 100% owned by DRC.*