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We screen new energy technologies with world-changing potential, including: The Energy Transition. Our work points to an economic decarbonization of the entire energy industry by 2050, with a CO2 price that averages \$40/ton.. The Ascent ...

Posted on March 7, 2024 March 11, 2024 by Thunder Said Energy. Power grids: the biggest bottleneck in the world? Power grids will be the biggest bottleneck in the energy transition, according to this 18-page report. Tensions have been ...

Thunder Said Energy is a research firm focused on energy technologies and energy transition. We publish research reports, data, economic models and patent screens into opportunities ...

To contextualize the growth that lies ahead, we have compiled data on US power generation installations, year by year, technology by technology, running back to 1950, including implications for turbine manufacturers, on pages 14-16.. The impacts of AI on US gas and power markets sharply accelerate US electricity demand, upgrade our US shale forecasts, especially ...

Some commentators argue that energy demand will naturally plateau as GDP rises in the future - or at least the beta between energy use and GDP will fall dramatically. As evidence, the energy consumption within developed world countries has hardly increased over the past 20-years, even as GDP per capita rose by 25%.

25% of global electricity came from burning 150bcfd of natural gas in 2023, generating 6,750 TWH of electricity from a fleet of 1.9 TW of gas turbines. The basic functioning, cost and efficiency of a typical gas turbine are described on pages 2-3.. Our goal in this report is to forecast the market for gas turbines through 2030. To predict the future, however, it is first ...

Decarbonizing aviation is challenging because of the requirement for very energy dense fuels. Jet fuel might reach 12,000 Wh/kg, while batteries today are 250 Wh/kg and will at best reach 1,250 Wh/kg (). We have evaluated sustainable aviation fuels, such as renewable jet, biogas-to-liquids, bio-ethanol-to-jet and e-fuels, but generally find them to be very expensive, hard-to-scale and ...

Human civilization will consume 80,000 TWH of useful energy in 2023. This is equivalent to a kitchen toaster, running 24 hours per day, 365 days per year, for every man, woman and child on the planet. 35% of global energy is used in manufacturing and materials, 30% is used in transportation and shipping, 20% is used in homes as heat and electricity, and 15% is used in ...

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analysis and company screens -- for one calendar year.. Additional terms: All our content can be shared fully within your organization.

Solar is the new energy source that excites us most, with potential to abate 11 GTpa of CO2 emissions by 2050 in our roadmap to net zero, ramping 18x from 2022, to supply 25,000 TWH of useful energy in 2050, or 20% of total global useful energy. But how much can solar grow? The answer hinges on relative costs. When global electricity demand is growing, then as a general ...

Silicon carbide material is one of the hardest crystalline composites known to mankind, with an enormously high melting point of 2,700°C and very high chemical resistivity. Hence it is used in the steel/metals industry, aerospace, brake pads of high-end automobiles and bullet proof vests. Silicon carbide material is made by super-heating high-grade silica (SiO2) with petcoke (C) in ...

Thunder Said Energy is a research consultancy that helps decision-makers find economic opportunities in the energy transition. The firm's research is fully unbundled, with backup models available for download.

Electricity Prices and CO2 Intensity Data. Retail electricity prices average 11c/kWh globally, across 28,500 TWH of global electricity demand in 2021, which is mostly composed of electricity consumption in 80 larger countries. The lower quartile is 7c/kWh and the upper quartile is 17c/kWh. The lower decile is 4c/kWh and the upper decile is 22c/kWh.

Thunder Said Energy | 2,631 followers on LinkedIn. The research consultancy for energy technologies | Thunder Said Energy is a research firm focused on energy technologies and energy transition. We publish research reports, data, economic models and patent screens into opportunities that can meet the energy needs of the world, while removing all of the net CO2. ...

This database contains a record of every company that has ever been mentioned across Thunder Said Energy's energy transition research, as a useful reference for TSE's clients. The ...

The energy uplifts from solar trackers have been estimated at 10-50% in different studies. But we can do better than this broad range, and actually calculate both the energy uplift and the revenue uplift from first principles, on pages 5-8. The economics of solar trackers can therefore be modeled more effectively.

Global heat pump sales by country are tabulated in this data-file, for 14 countries/regions. Developed world heat pump sales rose at an 11% CAGR over the decade since 2012, reaching 7M units sold in 2022, but then unexpectedly fell by -10% in 2023, including YoY declines in 7 out of the 14 countries we are tracking.

In 2010, before the Fukushima crisis, Japan produced 292 TWH of nuclear electricity, which would have required about 40MTpa of LNG imports if it had all been generated by gas instead.. With all its nuclear plants shut down in 2011-12, LNG imports jumped by around 20MTpa, while the remaining shortfall was covered by ramping oil-fired power back upwards by c600kbpd.



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Our global uranium supply-demand model sees the market 5% under-supplied through 2030, including 7% market deficits at peak in 2025, as demand ramps from 165M lbs pa to 230M lbs pa in 2030. This is even after generous risking and no room for disruptions. What implications for broader power markets, decarbonization ambitions, and uranium prices?

Today's lithium ion batteries have an energy density of 200-300 Wh/kg. I.e., they contain 4kg of material per kWh of energy storage. Technology gains can see lithium ion batteries' energy densities doubling to 500Wh/kg in the 2030s, trebling to 750 Wh/kg by the 2040s, and the best possible energy densities are around 1,250 Wh/kg.

Its ambition is to use wood residues to create carbon-negative plastics, cost-competitively with petroleum products and capture a "\$1trn market opportunity".. Our patent analysis shows Origin has visibly been focused on 5-chloro-methyl furfural as a building block. For example, CMF can be reduced to MF (loss of chlorine), further reduced to DMF (loss of OH) and then combined ...

This global energy supply-demand model combines our supply outlooks for coal, oil, gas, LNG, wind and solar, nuclear and hydro, into a build-up of useful global energy balances in 2023-30. We fear chronic under-supply if the world decarbonizes, rising to 5% shortages in 2030. Another scenario is that emerging world countries bridge the gap by ramping coal.

Posted on September 19, 2024 September 19, 2024 by Thunder Said Energy. Going platinum: PGMs in energy transition? Could PGMs experience another up-cycle through 2030, on more muted EV sales growth in 2025-30, and rising catalyst loadings per ICE vehicle? This 16-page note explores global supply chains for platinum and palladium, the long-term ...

Howmet Aerospace is a US engineered metals company, which goes back to 1888, has 23,200 employees, and is listed on NYSE.. Howmet's business is c50% engine products (in turn, 70% of which comprise blades and vanes for both jet engines and gas turbines, where it is the world's #1 supplier), 20% fastening systems, 15% engineered structures and 15% forged wheels.

Thunder Said Energy is a research firm focused on energy technologies and energy transition. We work with over 250 organizations, to help them find economic opportunities, which can improve the world's energy system, and ...

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