MARCH 5TH 2023

NEED TO KNOW NOW

China, aerostats & surveillance
The Mekong, dams, sediment, and viable agriculture
Shadow fleets, dark shipping, oil & sanctions
Fossil fuels are here to stay
Indonesia's electric vehicles nickel headaches

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1. China, aerostats & surveillance

"The aerostat flying over Mischief Reef may also have electro-optical and infrared camera packages, which could provide more immediate surveillance coverage around the island. It can also act as a radio relay so that line-of-sight communications are more robust with vessels and other islands nearby...the tethered aerostat platform offers a low-cost, but persistent means of providing this kind of sensor coverage around fixed locations."

And:

"Open-source intelligence (OSINT) analysts have been tracking the construction of a giant hangar on the northern edge of Xinjiang's Taklimakan Desert since 2013. That's when the People's Liberation Army cut the foundations of a colossal new building into the sands of a research facility to the southeast of Bositeng Lake."

"Its shape was familiar. But its size was unexpected. It's now one of the largest hangars anywhere on Earth."

An giant 350m by 140m hangar in China's secretive remote Xinjiang desert military testing grounds has raised speculation that it may be building an enormous airship capable of cruising at the edge of space while monitoring everything going on below.

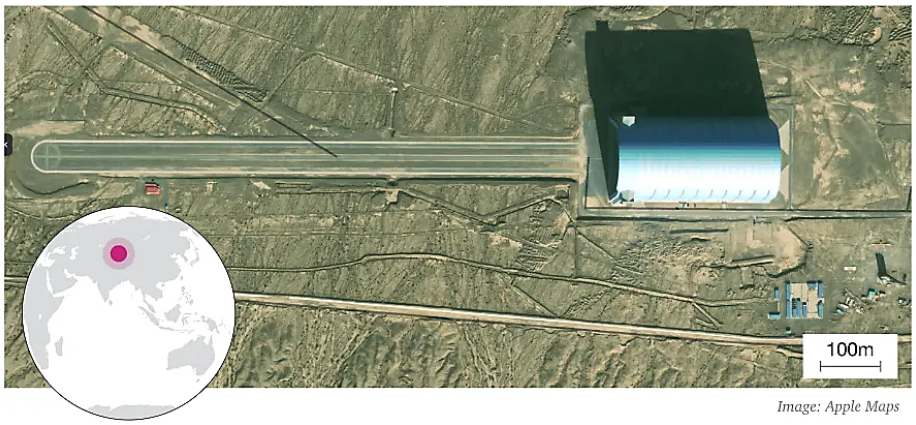


Image: Apple Maps

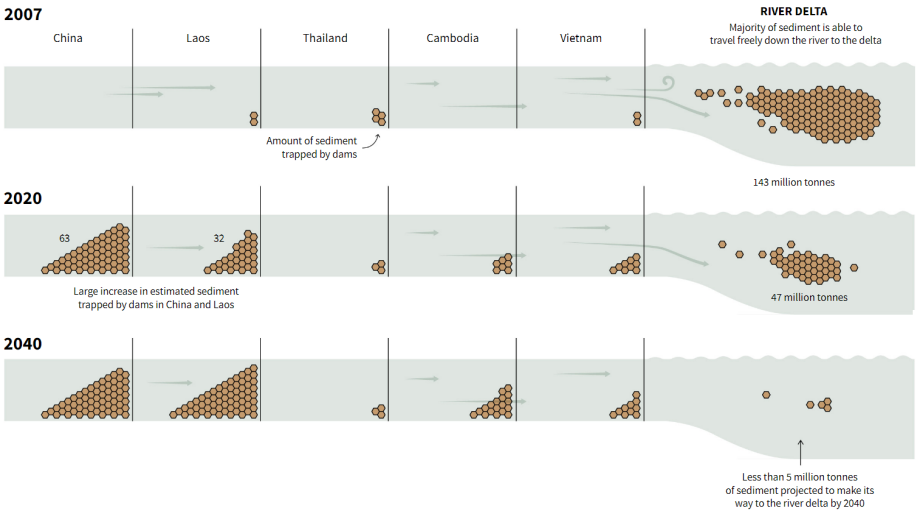
China: Aerostat-based surveillance developments in Xinjiang

2. The Mekong: Upstream dams vs downstream agriculture

"Just 15 years ago, Southeast Asia's longest river carried some 143 million tonnes of sediment – as heavy as about 430 Empire State Buildings – through to the Mekong River Delta every year, dumping nutrients along riverbanks essential to keeping tens of thousands of farms like Cung's intact and productive."

"...in 2020 only about a third of those river-borne soils would reach the Vietnamese floodplains, and at the current rate of decline, less than five million tonnes of sediment will be reaching the delta each year by 2040."

"The hydropower stations in China hold back precious sediment and water from the 65 million people living in the Lower Mekong River Basin, many who rely on the river and its floodplains for their livelihood."



Reuters: Projected sediment loss due to upstream dams on the Mekong, 2007-2040

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3. Shadow fleets, dark shipping, oil & sanctions

"Piecing together the exact size of the shadow fleet is almost impossible, with ownership details — and most individual vessels' commitment to Russia — shrouded in secrecy. Commodity giant Trafigura estimated it could total 600 ships, of which 400 are crude haulers. Privately, some shipowners put the figure slightly lower — between 10% and 12% of the global tanker fleet."

"Irrespective of whether they permanently leave the international market or merely shy away from it, the result could be higher shipping costs for Russia's rivals."

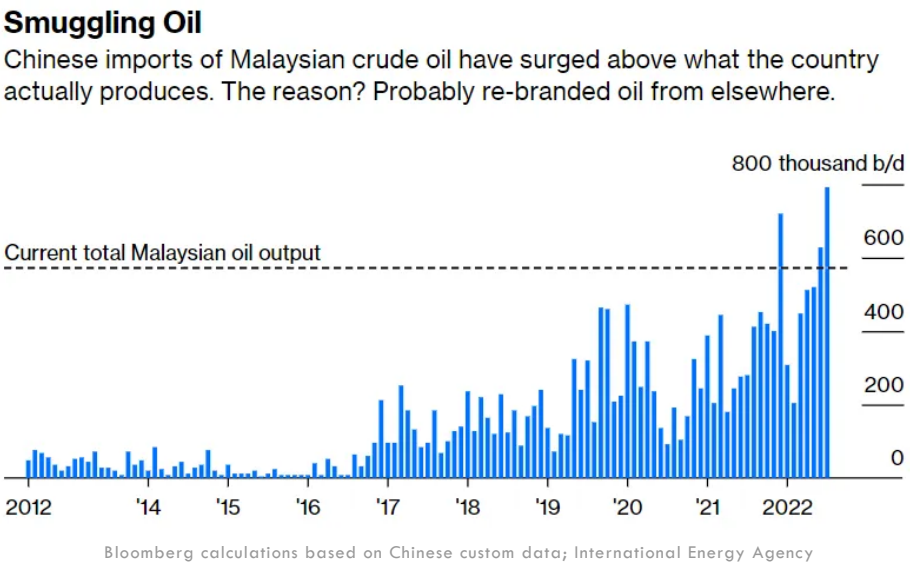
"Critically, as well as a fleet that's been split into Russian and non-Russian trading, a European Union ban on almost all seaborne

petroleum imports from its one-time trade partner has meant that ships are having to sail longer distances. That's made the fleet far less efficient, boosting demand for vessels and the cost of freight."

"Russia's pull [on] refined fuel tankers is already influencing the supply of vessels elsewhere, according to shipbroking officials.'"

And:

"Chinese imports of Malaysian crude oil have surged to almost 800,000 barrels a day — more than what the Southeast Asian nation actually produces. The waters of Malaysia are a hot spot for ship-to-ship transfers, allowing unscrupulous traders to mix crude from other origins and rebrand it as Malaysian. The actual origin likely is a mix of market pariah states Iran, Venezuela and Russia."



And:

"This has led many analysts to speculate that a large part of the crude from Malaysia – a known hub for ship-to-ship (STS) transfers – actually originated from producers under sanctions such as Iran, Venezuela, or Russia."

"Generally, independent Chinese refiners are unfazed by sanctioned oil as their priority is to buy low-priced crude and make good profits refining it."

"China continues to buy Iranian and Venezuelan crude, often masked as crude from Malaysia or Oman, various analyses and investigative reports have found over the past few years."

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4. Fossil fuels are here to stay

"A single gallon of gasoline contains approximately forty megajoules of chemical energy. Dividing energy by volume yields an energy density of **ten billion joules per cubic meter**. Gasoline is **ten quadrillion times more energy-dense** than *solar radiation*, **one**

billion times more energy-dense than *wind and water power*, and **ten million times more energy-dense** than *human power*."

Table 1 Energy density

Source	Joules per cubic meter
Solar	0.0000015
Geothermal	0.05
Wind at 10 mph (5m/s)	7
Tidal water	0.5–50
Human	1,000
Oil	45,000,000,000
Gasoline	10,000,000,000
Automobile occupied (5800 lbs)	40,000,000
Automobile unoccupied (5000 lbs)	40,000,000
Natural gas	40,000,000
Fat (food)	30,000,000

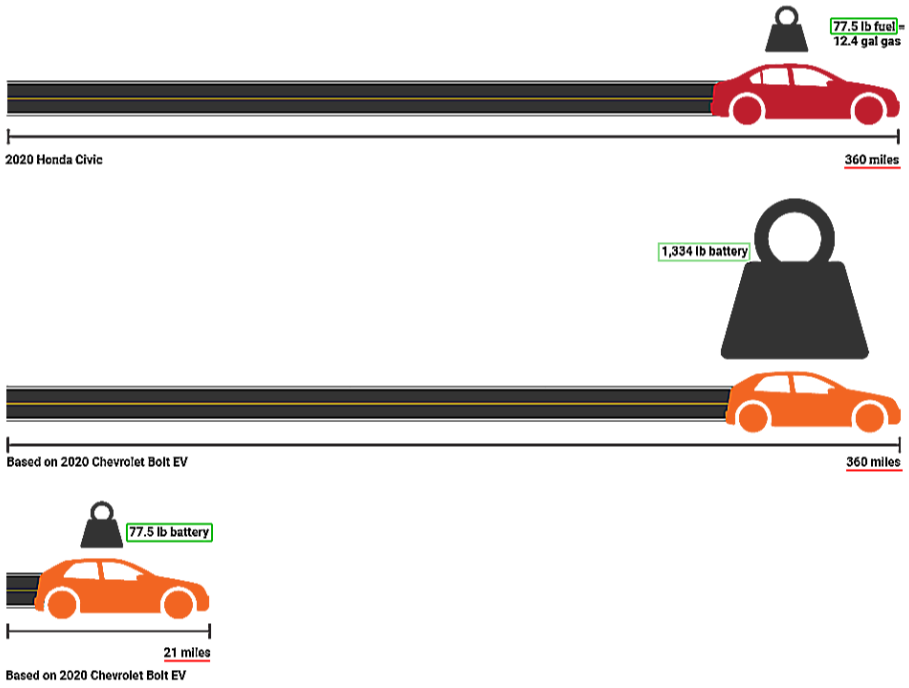
Energy density by source

And: Importantly, the **weight of an energy source** remains a key consideration:

"Gasoline carries much more energy per unit of weight than a battery. A **gas-powered car** with a 12.4-gallon tank carries **77.5 pounds** of gasoline."

"A **77.5-pound battery**, in contrast, would only carry an electric car **21 miles**."

"An **electric car** with a *range of 360 miles* would need a **1,334 pound battery**."



Mileage by vehicle, energy source and weight

5. Indonesia's electric vehicle nickel headaches

"The way nickel is processed, and particularly how Indonesian nickel resources are transformed into material suited for EV batteries, is energy-intensive and environmentally damaging. On average, producing Class 1 nickel from Indonesia's laterite ore resources releases two to six times more the amount of carbon dioxide emissions than producing Class 1 nickel from sulfide deposits."

"Moreover, Indonesia's energy grid remains highly reliant on coal - which accounts for approximately 60 percent of its total electricity capacity. Its industrial parks, which have become major hubs for nickel and aluminum processing, currently account for 15 percent of the country's coal power output."

"If plans to expand the captive power of these industrial parks are fulfilled, their share of Indonesia's total coal power output is expected to rise to 24 percent."

And:

"One report estimated that Indonesia may need $37 billion to shut down its coal-fired power plants — not including the cost to build a renewable energy industry to replace them."

"Particularly, laterite nickel mining could cause not only biodiversity loss but also erosion and sedimentation that may degrade riparian and marine ecologies downstream. Though mining companies claim to carry out land rehabilitation measures like post-mining reclamation and re-vegetation, the demand to stockpile nickel within a shorter span of time imposes environmental stresses that inevitably entail systemic destruction of nature (pdf link)."

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