**In April twenty-twenty-four the US Treasury Secretary, Janet Yellen took a week-long trip to China during which she criticized Beijing’s economic policy and warned President Xi and his colleagues that their current level of industrial capacity is very much viewed by Western nations as a dangerous OVER-capacity that could pose a risk to the rest of the world, by which I think she means the United States and Europe, but you know, mostly the United States.**

**The most pressing issue on Secretary Yellen’s agenda appeared to be China’s rather irritating recent habit of building lots of really very good quality electric cars and selling them to the public at prices that average working people can afford. Over here in the United Kingdom our government regards that sort of skullduggery as just not cricket you know! And in the two largest EU economies, France and Germany, the prospect of cheap Chinese cars flooding their domestic markets has prompted something of a meltdown among well-established legacy automakers.**

**And it’s the same problem with other energy transition hardware like solar panels, wind turbines and batteries. The message that ordinary folks like you and me are getting here in the West is that the stirring Dragon in the East is one of the great evils of the modern age, and it needs to be put back in its, in its…dragon box?**

**So, we should maybe have a think about that, shouldn’t we?**

**Hello and welcome to Just Have a Think.**

# China has pledged to reach net zero emissions by 2060 at the latest.

# About fifteen years ago, China’s leaders realised that decarbonisation was not only an important global goal but also an extremely urgent priority for improving air quality and public health in their rapidly growing urban centres. They also recognised that the economic revolution that was enshrined in their five-year plans would probably not be helped by building internal combustion engine vehicles that would struggle to compete with already well-established global brands and would lock the country into decades of expensive oil imports. So, China decided to dive enthusiastically into the development of battery powered electric vehicles instead.

# Meanwhile, here in the West, despite a very clear and obvious directional nudge by Tesla Motors, the major automotive manufacturers pretty much completely ignored the writing on the wall and elected to stick with old technology that they understood and were tooled up to produce.

**As a result, China has gained the so-called ‘First Mover Advantage’ over its Western competitors.**

**According to the data website EV Volumes, of the fourteen million or so electric vehicles sold globally in twenty-twenty three, about eight and a half million were sold in China, seventy percent of which were fully electric, and thirty percent were plug-in hybrids.**

**And the country is also revolutionising most other forms transport too.**

**“I’ve been tracking China’s renewables stats since 2014.”**

**That’s Michael Barnard, a global technologist who spent decades working for one of the world’s largest tech consultancy firms operating in a hundred and twenty-eight countries, and who now advises companies and policymakers in key markets INCLUDING South-East Asia and China.**

**“They’re electrifying their everything vastly faster than the rest of the world combined. “**

**They have 1.2 million electric trucks and buses on the roads, and now 43,000 kilometres of high-speed, grid-tied electric rail, which is displacing enormous amounts of aviation.”**

**By 2022, 27% of the buses on China’s roads had some kind of electric propulsion system. Eighty-four percent of that new fleet was pure electric, and that proportion is rising as the economics of hybrids and hydrogen fuel cells continue to make less sense to fleet buyers. That’s an astonishing rate of adoption. As recently as 2015 almost 80% of Chinese urban buses were running on diesel or gas.**

**According to the World Resources Institute, if China stays on its current trajectory, then greenhouse gas emissions from road transport in that country will peak well before twenty-thirty, ahead of the European Union and the USA.**

**And of course, as we’re all hearing so regularly in the news nowadays, having honed their craft and produced a range of extremely high-quality products, Chinese automakers now have their sites firmly set on global expansion. Chinese brands are already commonplace in Australia and South East Asia, and now they’re making a move into Europe and looking for ways into the United States. And that is definitely causing ‘a level of concern’ to put it mildly.**

**At the IAA Mobility auto show in Munich, Germany in September 2023, Renault’s Chief Executive, Luca De Meo, 4was quoted as saying…**

 **“It’s clear that they are very competitive in the electric car value chain. I think they are a generation ahead of us. We need to catch up very, very quickly.”**

**Over in the States, Jim Farley, CEO of the mighty Ford Motor Company, recently said "If you cannot compete fair and square with the Chinese around the world then 20% to 30% of your revenue is at risk" over the next several years.**

**A big complaint about Chinese EVs that’s often amplified in the western media is that they’re being kept artificially and unfairly cheap by massive state subsidies. But how accurate is that allegation?**

**According to a recent Bloomberg NEF analysis, incentives do exist, both for Chinese producers and consumers. EV buyers in China don’t pay any vehicle purchase tax for example. And Chinese automakers have received production subsidies over the last decade or so to incentivise them to prioritise EVs over internal combustion engine vehicles. Chinese firms have historically been allowed to purchase land at discounted prices too, and access low interest loans and research grants from local governments keen to attract new industry and jobs to their regions. America’s response has been to provide its own suite of incentives to US manufacturers as part of the Inflation Reduction Act and apply a twenty-eight percent tariff to Chinese EV imports.**

**According to a recent Reuters report, the US government is also putting huge pressure on Mexico to prevent Chinese suppliers setting up productions facilities there to take advantage of the North American Free Trade agreement, or NAFTA. Meanwhile, over here in Europe, in September 2023, the European Union launched a formal investigation into Chinese subsidies, claiming that “dumping” unfairly cheap EVs in foreign countries is in violation of international trade rules and anti-free market.**

**“How exactly is China subsidising stuff today, when they created an industrial policy that led to cheap products that are necessary now, by keeping their eye on where the ball would be?**

 **“So, right now, these decarbonisation necessities of the future : wind turbines, solar panels, high voltage direct current, batteries, heat pumps, you know, electric trucks, electric trains, erm it has massive economies of scale for all that stuff, because of stuff that China started doing in the ‘80s and ‘90s.**

**Their domestic supply chains are very short geographically. Part of that is, what they do is they create clusters for industries.**

**When I was looking at the electric bicycle market prior to COVID,**

**one district of one city is building a third of all the electric bicycles that China manufactures. One district. Which means that purchasing power parity is 40% better than the United Stated or Europe. That means every Yuan you spend, goes 40% further in your domestic supply chain. Some of that is wages, but wages have been increasing substantially.**

**You know if they need a part, the depot is right beside them. If a small firm gets a big order, they can assemble five other firms to fulfil that order in a way that just isn’t possible in North America or Europe, where the growth was more organic and more dispersed. Europe’s not going to find significant subsidies of these firms in 2024. The investment by the government and the focus by the government was 10, 15, 25 years ago.**

 **“Basically we’ve got a situation where Europe and the United States have taken their eye off the ball on fundamental technologies.**

**They lost track of the industrial policies. They thought that innovation was funding start-ups and research, not industrial policy.**

**So, what about the other Elephant in the room then – greenhouse gas emissions? One of the most common questions I get asked is ‘why should we bother reducing our emissions in the West when China is the worst polluter on the planet, and it keeps using more coal every year.’**

**According to a respected data analytics organisation called Global Energy Monitor, or GEM, China currently has just over 1,100 gigawatts of operational coal power capacity. That’s a lot of coal! In fact, according to this chart from Statista, it’s one and a half times more capacity than the next nine largest coal burning countries combined. It also has 268 gigawatts of announced new capacity, about 136 gigawatts of which is in construction.**

**So, there’s no room for complacency here. That’s a frightening amount of coal and it does indeed propel China to the top of the global emissions league table. But it’s worth scratching the surface a little bit here to get a slightly more nuanced picture. GEM also tells us that in the last few years China shelved, retired, mothballed or cancelled 775 Gigawatts of capacity based on old, less efficient technology burning dirtier forms of coal.**

**Those older plants emitted roughly one-point-four tons of carbon dioxide per megawatt-hour. Cleaner forms of coal burnt in new, more efficient facilities emit about zero-point eight tons per megawatt-hour. That’s more than a forty percent reduction in emissions.**

**“beautiful, clean coal”**

**Yeah, I know! I don’t think any RATIONAL observer is suggesting that going from ‘dirty’ coal to ‘clean’ coal is any reason for celebration! A forty percent reduction on a massive number is still a very big number, isn’t it?**

**So, China is working towards energy independence. They’ve been very honest about this. They said 20 years ago, 10 years ago, ‘yes, climate change is real, it’s serious, it’s caused by us, and China’s a big polluter. But we have hundreds of millions of people that are living in abject poverty. We need to bring them out of abject poverty before we can fully decarbonise.**

 **“They’ve got their cities built. They’ve got all their subways built. They’ve got all their airports built.**

**They’ve got all their highways built. They’ve got 177,000km of highway. Second only to the Unites States. But that demand curve is flattening out. And so, their domestic demand for coal, for energy for infrastructure is going to flatten and diminish.”**

**And there’s another important detail to take into account here. Total system capacity is NOT the same as real-world operational output.**

**“China uses its coal plants the way the United States uses its gas plants. The United States is running its gas plants at about 49% capacity factor. So, 49% of the total possible generation from their gas plants is how much they use. And China’s stats for the coal plants are virtually identical. They use coal for peak demand. United States in its merit order uses natural gas for its peak demand. And so, if we think about them as peaker plants and we think about the merit order for electricity which is – if there’s renewables or low carbon stuff, let’s use that first, and then at the end of it, oh there’s this other stuff, the fossil fuels, lets use that last. That’s the merit order. And China has one as well.”**

**In fact, according to David Fishman, in this article from September 2023, all new coal-fired power plants in China now have to have the technical ability to reduce their power output to only 30% load during periods of low demand. That’s not a profitable way to run any kind of power generation facility.**

**State subsidies will be the only lifeline that keeps those plants running as a back-up firm power source to fill the gaps in intermittency while the country continues to build out its wind, solar, hydropower and energy storage capacity. But that expansion is happening so rapidly that while some new coal power plants may survive for a couple of decades, many will become stranded assets, and their owners will exit the market at a loss.**

**So, although the charts look a little alarming right now, David Fishman’s article concludes that…**

 **“If hydropower pulls its weight and renewables maintain their blistering growth, it’s likely China’s coal consumption will tick upward to peak in 2023, plateau in 2024, and begin its long decline thereafter.” In China, there’s just been this accelerating curve of wind, water and solar in China.**

**While nuclear has flatlined. Even China can’t scale nuclear, but they’re scaling wind and solar at a tremendous rate. So now we’re at the point where the IEA is calling for China to build over the next few years, 30% more wind and solar than the rest of the world combined.” “The three big things. Electrify everything. Build lots of renewables. Build lots of transmission, mostly high voltage direct current, and build some storage.”**

**One of the things I looked this year was the statistics globally on pumped hydro. This is finally getting the attention its due. A gigalitre of water – that’s a billion litres of water – at 500 metres difference, is a gigawatt-hour of storage. And the ponds are a square kilometre a piece. The amount of land space used is miniscule compared to the energy storage.**

**So, what’s China doing? Is it putting in lots of batteries? Yeah, of course it is. But it has 19 GW of power capacity in pumped hydro in operation today.**

**It has 68GW in construction today. And in total, planned and in construction, it has 365GW of pumped hydro in its current plans, and it’s expecting to have most of those launched before 2030 and many of them complete before 2030. That’s probably 8 to 15 terawatt-hours of energy storage.**

**This is where China’s going. They’re going to grid storage. They’re going to broad transmission across their space. And let’s remind people. Europe is about 10 million sq.km. The United States is about 10 million sq.km. China is about 10 million sq.km.**

**And so that means they can move sunshine from the West to the demand centres in the East quite nicely for the evening demand peaks.**

**And they’re going there very rapidly. They’re increasing electrical demand insanely rapidly. They’re increasing renewables incredibly rapidly. But in the meantime, they have this transitionary backstop of burning less and less and less coal every year.”**

**According to a survey by the European Investment bank,**

**seventy-three percent of the Chinese population regard climate change as a major threat to society. That means Chinese leadership is pushing at an open door when it comes to the incredibly disruptive changes required to rapidly accelerate their energy revolution.**

**Not every Chinese citizen enjoys the same freedoms though, of course. Political opposition is aggressively subdued,**

**and disturbing human rights abuses, particularly among the Uyghur community in Xinjiang Province, have been widely publicised over here in the West.**

**These are all part of the frustrating contradictions that China often produces.**

**I would assert that the biggest advances in human rights in the past forty years,**

**has been China bringing 850 million people out of abject poverty into the lower middle class and middle class. China is already strategically positioning itself to be able to get credit, to decarbonise its economy, electrify its economy, run everything on renewables, carbon price everything, so that when it’s shipping to the second largest economy in the world and one of the biggest import economies in the world, they’ll still be cost competitive”**

**So, how should the West respond to the Chinese juggernaut? Do we ostracize and demonize them and put up impossible trade barriers that will inevitably be reciprocated and might cause more pain than gain to western economies, or do we embrace China’s technological revolution, allow some of their production to come to our own shores to provide well-paid jobs for our own workers, and cooperate with them commercially and politically so that we can continue to apply pressure on issues that we find to be completely at odds with our western philosophy of democratic freedom? Well, you know what? I’m going to leave that one for you to have a think about. I’m quite sure there will be extremely strong views either way on this one, and I will be fascinated to see how the consensus view pans out. So, if you’re currently itching to offer some of your own wisdom, then, as always, the place to leave your thoughts is in the comments section below.**

**That’s it for this week, though. A massive thank you, as always, to the amazing folks who support the channel via Patreon, and I must just give a quick shout out to some folks who’ve joined recently with support of ten dollars or more a month. They are Valeria Rae, Nils Wetterlind, Andrew Davies, Pat Lenahan, Richard Swain, Lennart Mäkinen, Kristian and Spencer Marlow**

**And of course, a huge ‘thank you’ to everyone else who joined recently too. That Patreon support means I can keep the content completely independent with absolutely no ads or sponsorship messages. If you like that concept and you’d like to get exclusive early access to my videos AND influence future content, then you can find out how to do that by visiting patreon.dot.com forward slash just have a think.**

**And if you don’t want to miss out on notifications of new videos each week, then make sure you select the completely free option of clicking on that subscribe button and switching on all notifications, which you can do down there somewhere or by clicking on that icon there.**

**As always though, thanks very much for watching! Have a great week, and remember to just have a think.**

**See you next week.**