**So, April twenty-twenty-five has been an interesting month on the world stage, hasn’t it?**

**Well, I suppose ‘interesting’ might not be precisely the adjective that some of you may choose, but I’m sure you know what I mean anyway.**

**One of the MOST ‘interesting’ observations, at least from my vantage point as someone who researches the climate emergency and sustainable technologies, is the contrast between the amount of noisy rhetoric coming from some quarters about how they’re going to smash climate legislation and usher in a new era of reinvigorated fossil fuel energy domination, and the real word data that demonstrates just how extensively those pronouncements are failing in the real world. Or to put it another way, just how successful the transition away from fossil fuels and TOWARDS renewables continues to be, despite such a concerted effort to thwart its progress**

**In twenty-twenty-four, for example, China surpassed its own twenty-thirty target for wind and solar capacity SIX years early. And yes, they’ve opened coal fired power stations as well, but most of those facilities are either standing dormant or are operating at fifty percent capacity or less – effectively like peaker plants just there as a worst-case scenario comfort blanket to ease the anxiety of backward-looking energy providers. Many of them will most likely be bankrupt and shut down within a decade. The reality is that China is on course to hit peak coal consumption THIS YEAR, reach peak overall greenhouse gas emissions by twenty-thirty, and quite likely arrive at net zero before any other major nation on the planet.**

**India is also enjoying some success. That country witnessed a thirty percent surge in solar power last year. The European Union saw solar PV generation surpass coal for the first time. And Africa experienced a tenfold increase in installed energy storage capacity, enhancing grid stability and supporting the integration of renewables across the continent.**

**And now the highly respected industry analysts Ember have published a paper analysing AMERICAN electricity generation data for twenty-twenty-four.**

**And ITS findings are really VERY ‘interesting’ INDEED!**

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

**I sometimes wonder whether it would be better, at least for the purposes of energy transition analysis, to ignore the central pronouncements of the federal government and look instead at the efforts being made in each of the fifty states. For example, when Donald Trump originally and rather dramatically pulled the country out of the twenty-fifteen Paris Climate Agreement back in twenty seventeen**

**“The United States will withdraw from the Paris Climate Accord”**

**No fewer than twenty-four US states representing about fifty-five percent of the US population and sixty percent of the national economy publicly declared that they would have no part of such nonsense and would continue working extremely hard to stay within the confines of the Paris framework.**

**Those states, now collectively known as the US Climate Alliance, have steadfastly upheld their commitment to that goal, despite a Trump two-point-O executive order reversing Joe Bidens executive order reversing Trumps original executive order withdrawing the US from Paris**

**“Confused? You won’t be after this episode off…”**

**Anyway, that does leave twenty-six states that DIDN’T join the Alliance, one of which is the staunchly Republican oil rich state of Texas. No pinko, commie, left wing, woke pronouncements on ‘staying within the framework of the Paris Climate Accord’ (sarcy voice) for our red-blooded friends in the Lone Star state, eh?. Heaven forfend!!!**

**No, just a quiet, record-breaking eight hundred percent increase in solar capacity installations since twenty nineteen, to go alongside a fifty percent increase in wind power, and a five thousand five hundred percent increase in battery energy storage capacity, ramping IT up to six thousand two hundred megawatts, with the state energy provider, ERCOT, projecting that number to reach SIXTEEN thousand megawatts by late twenty-twenty-five.**

**And there are plenty of other red states forging ahead with very profitable renewable energy projects providing highly skilled and well-paid employment for their citizens.**

**So, how did that all shake down into the data that the EMBER team looked at recently then?**

**Well, let’s just give you the most interesting headline right off the bat, shall we?**

**According to US EIA data, in twenty-twenty-four, for the first time in US history, wind and solar generated more electricity than coal. Together, those two technologies accounted for seventeen percent of the country’s total, while coal slumped to an all-time low of just fifteen percent.**

**Rising consumer demand did also drive an increase in methane gas production, but solar generation met more of the rise in electricity demand and fall in coal than gas did and it remains the fastest growing source of American electricity, up twenty-seven percent in twenty-twenty-four, surpassing hydro generation for the first time.**

**Only six years ago, according to EMBER, coal production was three times the size of all US wind and solar combined. That’s quite a dramatic set of upward and downward trendlines in a relatively short space of time.**

**What’s been the main driver of that meteoric growth in renewables? Well, it’s batteries, isn’t it?**

**Overall battery energy storage in the USA rose to a third of the level of solar PV in twenty-twenty-four and the technology is expected to jump up to sixty percent of solar by the end of twenty-twenty-five.**

**All very nice and lovely and everything, but there’s clearly still massive scope for improvement in the USA. EIA data tells us that twenty-eight states still only generate five percent or less of their electricity from solar, and it turns out that eighty-five percent of all the capacity growth in solar and wind AND methane gas went towards meeting increased consumer demand, with only fifteen percent actually replacing the decline in coal.**

**According to the folks at EMBER the United States now faces a key challenge to ensure clean generation grows fast enough to meet rising demand. And they say that depends on two key factors –the expansion of clean electricity generation and the electrification of energy demand. It is starting to happen though. In twenty-twenty-four electric vehicles made up twenty percent of all new car sales and US consumers bought more heat pumps than gas boilers with the much more efficient electric powered technology accounting for fifty-seven percent of all new space heating installations.**

**One of the biggest barriers that renewables face today though, is that they have to operate within the confines of a very old-fashioned centralised extraction-based energy system which is not well set up for distributed inputs from thousands or even millions of different sources scattered all over the country. That old model needs to be addressed as an urgent priority, because if it isn’t then the energy transition will be severely hampered, and our kids and grandkids will arrive at somewhere around the year twenty-eighty when the last few reserves of oil and gas are no longer economically viable and wonder why all the lights have gone out. And that would be really silly, don’t you think?**

**Several major grid expansion projects were proposed in twenty-twenty-four to enhance resilience as demand rises and renewables grow. That expansion is only at the foothills of a steep growth curve but if it’s managed correctly then the EMBER analysts reckon lean power will be able to meet those growth demands without raising bills, or sacrificing security of supply or requiring any increased reliance on gas.**

**And of course, once that infrastructure has been built out, gas supplies can be phased out as well, just as coal has been over the last few years.**

**But what about stuff like nuclear power Dave, and hydro and bioenergy?**

**Well, yeah. Fair question.**

**The data show that nuclear power generation rose by just one percent last year with the commencement of operations with the Westinghouse AP1000 pressurized water reactor at Vogtle unit 4 in Burke County, Georgia, to run alongside unit 3 which was commissioned in twenty-twenty-three.**

**Overall, though, nuclear’s share of total supply dropped below eighteen percent, which is the lowest it’s been this century.**

**Only three nuclear units have come online since nineteen ninety-eight and there are no new commercial reactors under construction, so on the timelines that we’re talking about here, it’s very unlikely nuclear power will be filling any significant gaps.**

**US Hydropower generation actually FELL by one percent last year to its the lowest level since the turn of the century, largely as a result of the drought in the Columbia River basin going into its second year, leading to low generation in Washington, Oregon, Idaho and Montana.**

**Bioenergy also fell by about a percent, which apparently made last year the tenth in a row when that’s happened. It now accounts for only one percent of total US generation and the idea of turning over vast swathes of land to grow the relevant crops to ramp up this particular technology seems a little fanciful to say the least.**

**The question I can hear a lot of you asking right now though is whether these apparently impressive statistics for renewables are just a bunch of pie in the sky in the face of that rising consumer demand, especially for things like data centres and AI, compounded by a renewed enthusiasm in the fossil fuel industry to ‘drill baby drill’. I mean, are we actually reducing the amount of greenhouse gases going up into the atmosphere or not, because that is surely the whole point of the exercise, right?**

**The answer to that is of course no.**

**At least not yet we’re not, anyway.**

**So, the following question must therefore be CAN we achieve that goal in the near future by pursuing a one hundred percent solar, wind and battery energy storage strategy?**

**Well, that prognosis depends entirely on who you listen to really.**

**If you get your info from people who insist that the ONLY way to ensure energy security is to stay within the existing model of extracting finite resources from the ground and storing them in warehouses, tankers, silos and pipelines so that we know we’ve always got enough reserves to burn through whenever we need them, then I suspect the answer will be that a one hundred percent renewables future is delusional nonsense.**

**I never seem to quite get such a robust answer when I ask those folks what we do when those non-recyclable resources run out in about fifty years’ time, but I guess that’s a small wrinkle that those very stable geniuses will help us with when the time comes.**

**Alternatively, if you care to listen to people like Professor Mark Jacobsen of Stanford University, or Tony Seba and James Arbib of the think tank Rethink X, then the answer is an unequivocal YES – we can absolutely transition to a one hundred percent renewable energy future, IF the will is there and the transition is managed correctly with some very brave decision making on the part our global policymakers. In fact, Tony Seba and Jamie Arbib have just written a book explaining precisely how that sunny upland could be reached. It’s called Stellar, and trust me folks, whether you agree with them or not, one way or another, this book will certainly capture your attention – as it did mine. That might be something we delve into in more detail in a future video, but in the meantime, if you want an example of how this sort of stuff has actually started to work out in the real world then I can highly recommend jumping over to my friend Rosie Barnes’ channel and watching her latest video all about the UK energy transition, which even features a cameo appearance from yours truly.**

**And of course, if you just want to rant and rave and tell me what a dreadful person I am for even suggesting that a one hundred percent renewable energy transition is feasible, and that I really should get in line with the Great Orange Overlord’s master plan, then do feel free to pop down to the comments section and leave your thoughts there.**

**That’s it for this week though.**

**Thanks, as always to the amazing folks over at Patreon, who help me keep this channel’s content completely independent and free of ads and sponsorship messages. And I must just give a quick shout out to a couple of folks who’ve joined recently with pledges of ten dollars or more a month. They are Rez Kitten, Robert Boner (Robear Bon-air) Amy Easton and Rocket Ron. And of course, a huge thank you to everyone else whose joined since last time too. If you enjoy these weekly videos and you feel you could support the work I do here at Just Have a Think then jump over to Patreon dot com forward SLASH just have a think to find out how you can join the team and have a look at all the exclusive perks you can get there, including a direct chat line to me, plus exclusive videos and monthly content polls.**

**And of course, you can really hugely support the channel completely for free by hitting the subscribe button on YouTube and clicking on all notifications, so you don’t miss any of the content. That’s just a couple of clicks away, either down there or on that icon there.**

**Most important of all though, thanks very much for watching! Have a great week, and remember to just have a think.**

**See you next week.**