**So, we had a global climate conference recently, as you know. It was called COP28, as you know, and it was held in the United Arab Emirates, as you know. And if you watched my summary video a couple of weeks back you will also know my view of the proceedings.**

**One of the more ostensibly positive declarations that we did get though, from no fewer than one hundred and sixteen countries at the event, was a pledge to TRIPLE their renewable energy generation capacity by 2030.**

**There are plenty of analysts who argue that this sort of thing should have long since been regarded as the very bare minimum that any reasonably sizeable and competent country should already have been well on course for achieving, but in the time-honoured tradition of COP meetings, it was instead trumpeted as some kind of heroic herculean achievement by world leaders to protect the future of your children.**

**Anyway, I promised myself I wouldn’t start wondering off into rhetoric this week. I’ve been doing a lot of that recently. So, I won’t go on about it, except to ask the obvious question that should naturally follow a proclamation like this one…**

**How are they going to do that then?**

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

**There’s quite a wide spectrum of opinion on renewables out there in the Energy Research and Analysis world, ranging all the way from some of the more vocal fossil fuel advocates and nuclear industry sponsors who tell us that wind and solar are nothing more than the delusional pipe dream of an ideological far left cult that ultimately wants to see us all living in caves…**

**“Help me**

**right through to, well everyone else really, including organisations like RethinkX, who I featured a couple of years ago, and academics like Mark Jacobsen and others, who have spent years crunching the numbers and honing their projections and who have demonstrated quite convincingly that the world can move to a fully one hundred percent renewable energy infrastructure without us all having to go back to dressing like Raquel Welch. I don’t know about you, but I haven’t got the figure for it anyway.**

**Somewhere in that heady mix of opinion though, attempting to offer what they see as the voice of cold hard market driven pragmatism, perhaps with a hint of social conscience, are the folks at Bloomberg New Energy Finance or BNEF. I realise of course there is almost as wide a spectrum of opinion about Mike Bloomberg as there is on renewables themselves, but I’ll leave that for others to argue about.**

**What Mikes team did, in a remarkably prescient move, ten days prior to the start of COP28, was to produce their own analysis, literally entitled “Tripling Global Renewables by 2030”.**

**Uncanny!**

**So, what pearls of wisdom can we glean from this piece of work then?**

**Well, right up front, it is going to be a challenge, they make no bones about that. Here’s a few numbers to get us warmed up, so to speak…**

**According to Statista, total global electricity generating capacity in twenty-twenty-two was just over eight-thousand five-hundred gigawatts, and Bloomberg’s own chart shows that renewables produced about three-thousand-eight-hundred gigawatts of that total.**

**The BNEF report shows that a tripling would therefore take renewables to about eleven thousand gigawatts, or eleven terawatts by twenty thirty, which is significantly more than TOTAL global capacity today.**

**Now - quick memory jogger. Watts are units of power, and Watt-hours are units of energy. In other words, a thousand watts, or one kilowatt, of power delivered for one hour equals one kilowatt-hour of energy, and one kilowatt-hour is what you and I would recognise as ‘one unit’ when we look at our electricity bill. So, the eight terawatts of global electrical power generating capacity in twenty-twenty-two produced a total global electrical ENERGY consumption of about twenty-five thousand terawatt-hours.**

**You’re welcome.**

**Anyway, according to BNEF, the last tripling of renewable capacity apparently took the world twelve years to achieve, and now we’ve got to triple a much bigger number, but this time in less than EIGHT years!**

**The good news is that wind and solar are now the cheapest sources of new generation in most countries and the BNEF team reckon if we CAN triple capacity by twenty-thirty then that would provide sixty-two percent of the total greenhouse gas emission reductions that we need by that time if we want to stay on track for net zero in twenty-fifty. I know all these dates and numbers are a bit arbitrary, but you have got to have some sort of target to aim at, don’t you? Otherwise, we’d just have anarchy, and that wouldn’t do at all!**

**The more challenging news is that the only way to reach the goal is through a massive acceleration in industrial and governmental support. BNEF analysis shows that the rate of renewables investment would have to double, from just over half a trillion US dollars in twenty-twenty-two, to nearly one-point-two trillion dollars EVERY YEAR between now and the end of this decade.**

**It also needs global investment in our woefully neglected electrical grids to reach about seven hundred and eighty billion dollars a year by twenty-thirty –almost three times what was spent in twenty-twenty-two. And the world would need a slightly eye-watering seven hundred and twenty gigawatts of utility-scale battery capacity, which in case you’re wondering, is about sixteen times what we have today.**

**So, yeah. Busy, busy!**

**It is absolutely within our gift though, say the folks at BNEF. Existing supply chain capacity investment for solar, wind and batteries IS, apparently, enough get us there, albeit with a bit of pushing and shoving to get rid of stupid road blocks like zombie projects in grid installation queues, for example.**

**Solar PV installations are apparently rattling along nicely, most notably over in China where a new capacity record seems to get broken about once a week or so, but also in plenty of other parts of the world as well.**

**Wind power needs a bit more of a concerted effort though, says BNEF. We could technically get to the tripling target number just using solar alone, but as this report points out, wind and solar are extremely complimentary technologies, so it makes much more sense to build in that extra energy delivery security using both technologies rather than relying on just one. The detailed explanation for that gets a bit technical I’m afraid.**

**Bloomberg say their Net Zero Scenario would require more than twenty-two-thousand terawatt-hours of renewable energy by twenty-thirty. That’s based largely on five-point-three terawatts of solar capacity and three-point-six terawatts of wind. Now here’s the technical bit… BNEF says that although renewable GENERATION CAPACITY tripled between twenty-ten and twenty-twenty-two, renewable ENERGY supply only increased by a factor of two-point-one.**

**Why? Well, because a lot of the new capacity was solar, and solar has a comparatively low ‘capacity factor’, which is a measure of how much real-world energy you get from a power source compared to how much you COULD get if the power source was running at 100% full pelt all the time.**

**For solar, that ranges from about thirty percent in somewhere sunny like Chile, down to only about eleven percent in somewhere a bit more ‘dunkelflaut-ey’ like Germany or Eastern China. The global average, according to Bloomberg’s analysis, actually worked out at thirteen-point-two percent.**

**By contrast, wind farms had an average global capacity factor in twenty-twenty-two of twenty-seven-point-two percent. Hydro is in there as well of course, with a global average of forty percent, and geothermal came out at a whopping sixty-eight percent.**

**The thing is though, Solar is now so dirt cheap, thanks to China, and so quick and easy to install, that it has effectively become the course of least resistance for green energy developers who, like it or not, are just as driven by their financial bottom lines as any other energy producer in the world. So, we need to somehow guard against that getting out of hand, says the BNEF team. They argue that a rapidly-decarbonizing world that is overly reliant on solar won’t achieve as big an impact on electricity generation or emissions reductions as one with a more diverse mix of renewable technologies.**

**It’s all do-able though, that’s the point I think the BNEF paper is really trying to make here. We’re certainly not limited by economics, because deploying more renewables has been demonstrated to be generally economically beneficial, especially in regions with rapidly rising electricity demand. And the size of the prize, in terms of emission reductions is high indeed. You may have seen last week’s video about energy efficiency, based largely on research carried out by the International Energy Agency or IEA. And when you combine the findings of that report with what we’ve looked at so far today, you get a very powerful impact, as the folks at yet another energy industry thinktank, Ember Climate dot org, very kindly quantified for us in this recent article. They say that if the world successfully combines the ramp up in renewables with the annual doubling of energy efficiency improvements from two percent today to the four percent that we looked at last week, then that would deliver eighty-five percent of cuts to unabated fossil fuel requirements by twenty-thirty and more than halve CO2 emission by twenty-thirty-five.**

**And then we really would be cooking on gas – partly because we wouldn’t be cooking on gas, if you see what I mean.**

**OK, so it is technically and economically feasible. The question is, can it actually be done in the real world?**

**Well, not from where we’re at today says BNEF. Under current policies, we’re on course for a projected five-point-eight terawatts of solar capacity by twenty-thirty, and only one-point-nine terawatts of wind. Even when you add in all the other technologies like hydro and geothermal and so on, you only get to a total twenty-thirty global renewable capacity of about nine terawatts, versus the eleven-terawatt target.**

**So, what needs to change then?**

**Well, according to the Bloomberg crew, the checklist for policymakers and regulators looks a bit like this -**

**Remove barriers to access, like unrealistic licensing requirements and ambiguity around land ownership.**

**Remove the trillion dollars or so of annual explicit government subsidies that the fossil fuel industry still receives today.**

**Improve and expand the auction process for new clean power projects and get fixed or predictable prices into offtake agreements.**

**Make sure any new agreement is properly designed and assessed as being for the long-term good of a given power system.**

**Facilitate strong competition between developers to get the best prices WITHIN the framework of quality and long-term suitability.**

**Instigate massive investment in grid infrastructure to provide the right level of distribution capacity for the future and avoid the ridiculous amount of renewables curtailment that goes on today.**

**Employ and train up a whole new workforce at municipal level to speed up the permitting process and**

**deal much more quickly with necessary but currently very frustrating bottlenecks like environmental impact studies and appeals,**

**including the creation of a robust, comprehensive, centralised data base of geographical conditions and biodiversity.**

**In short, pretty much a complete redesign of the entire global energy industry as we’ve known it for about the last five or six decades. And if we could have that done by about, ooh… [look at wrist. See there’s no watch there]**

**Thursday? That’s be great!**

**I’m quite sure you’ve got your own take on the energy transition and the role that renewables will need to play in it, so as always, feel free to jump down to the comments section below and leave your thoughts there.**

**That’s it for this week though.**

**Thanks, as always, to our Patreon supporters, who keep ads and sponsorship messages out of all of these programs.**

**Now, I know I say this every week, but subscribing to the channel here on YouTube costs precisely nothing at all, and it really makes a difference to how the algorithm chooses which videos to offer people. While I’ve been ranting and raving about the fossil fuel industry and the COP28 process in various videos over the past few weeks, YouTube has decided to effectively shut down the channel’s circulation almost completely. So, while I’m getting back on track with a better mix of sustainable technology videos for twenty-twenty-four, you could really help to kick-start that process by clicking down there somewhere or on that icon there.**

**Most important of all though. Thanks for watching!**

**Have a great week, and remember to just have a think.**

**See you next week.**