**I’m sure most of you know this guy, but for those who don’t recognise him – he is Bill McKibben, the founder of one of the best-known US climate activism groups, 350 dot org.**

**Bill’s been banging the drum for climate action for well over three decades now. He’s written a dozen books on the subject and is now the Schumann Distinguished Scholar at Middlebury College in Vermont.**

**In July twenty-twenty-five, Bill wrote an excellent piece for The New Yorker, which by the way I’ve linked in the description section below. The article contains a whole bunch of pretty staggering statistics specifically focussed on the astonishing global rise of solar power in recent years.**

**How about this stat for example…the photovoltaic solar cell was invented in nineteen fifty-four, and it took between then and twenty-twenty-two for the world to reach one terawatt of installed solar power. The next terawatt took just TWO more years, 00:56 arriving in twenty-twenty-four, and the third terawatt will arrive in late twenty-twenty-five.**

**I think we can legitimately use the word exponential here, can’t we?**

**Bill tells us that the equivalent of one coal fired power plant - roughly one gigawatt - of SOLAR POWER is currently being installed every fifteen HOURS.**

**A lot of that is in China of course, and as a country with vast tracts of more or less uninhabited land out in the west, they’ve got lots of space to create those enormous solar parks we often hear about.**

**But what about the rest of the world? How do we shoehorn in enough solar panels to keep up with what is quite clearly becoming the de-facto primary new energy technology?**

**Well, there are actually lots of ways of course, but in June twenty-twenty- five an organisation called the Global Energy Monitor published a comprehensive survey of the vast tracts of scarred wasteland that have been left behind just in the last five years alone by abandoned COAL MINES. And they’ve identified some pretty good reasons why those sites might just be perfect for solar expansion.**

**So, I thought we should have a think about that.**

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

**So, the Global Energy Monitor, or GEM, is San Francisco–based non-governmental organization, founded in two-thousand and eight with the goal of cataloguing fossil fuel and renewable energy projects worldwide and providing that information to governments, media and academic researchers in support of clean energy. So, they’ve been doing this stuff for a while now.**

**They tell us that today, there are three thousand eight-hundred mines producing ninety-five percent of the world’s coal. When a mine gets shut down it typically leaves behind a large area of degraded and abandoned land that nobody really wants to deal with, but which is often ideal for solar developments.**

**This latest research found no fewer than three hundred coal mines that have been decommissioned in the last five years, taking up an area of land the size of Luxembourg.**

**The potential for solar generation at those sites is really quite remarkable.**

**Just very quicky though, if these sorts of videos are your cup of tea, then you’d be massively supporting my ability to produce them each week by clicking the subscribe button and selecting all notifications, so you don’t miss any of my future videos.**

**Now, when I say remarkable,**

**I mean that the authors of this report found that those three hundred sites could support something like a hundred and three gigawatts of solar capacity. AND they identified another one hundred and twenty-seven mining sites that are due for closure in the very near future that could potentially become home to a further one hundred and eighty-five gigawatts of solar by twenty-thirty.**

**So, is that a lot then? Well based on the stats we saw from our friend Bill McKibben at the start of the video, that sort of roll out would represent about fifteen percent of total global solar capacity in twenty-twenty-four - enough to meet the annual electricity consumption of a large industrial nation like Germany. So, I think we can say that’s pretty significant, can’t we?**

**There’s a bunch of really smart reasons for targeting these sites, which we’ll get into a little bit later in the video, but I guess the first question might reasonably be WHERE are they all?**

**Well, unsurprisingly, the GEM data show that there are already NINETY operational so-called mine-to-solar conversions in CHINA, with a capacity of fourteen gigawatts. And another forty-six are in the offing, representing a further NINE gigawatts.**

**BUT for once, its not all about bloody China, thank goodness.**

**According to GEM’s tracker map, there are abandoned sites all over the planet. A total of twenty-eight countries with recently abandoned coal mines have been identified, with some significant closures in India, Australia, the US and Indonesia. They’ve also included a bunch of sites in Russia, presumably just for a bit of a laugh, I don’t know…but good luck getting Vlad the Impaler to allow solar panels to go on any of those sites!**

**Anyway, back in the real world and outside of China, it’s the four major coal producers that I just mentioned that appear to have the greatest opportunity for coal to solar transitions**

**Down there in Oz the GEM team found fourteen hundred and seventy square kilometres of mine sites that could support seventy-three gigawatts of solar capacity – that would triple that country’s total solar fleet.**

**Indonesia’s potential is even more impressive –there’s apparently enough disused coal mine space spread across the world’s largest archipelago state for nearly SIXTY gigawatts of solar, which would be a HUNDRED times more than the nation’s currently installed capacity.**

**Meanwhile the good old US of A stands out for the sheer NUMBER of identified sites, following the well-documented and rather precipitous demise of that nations coal industry in recent decades. —a total of two hundred and seventeen disused coal mining operations that could offer a combined solar capacity of almost FIFTY gigawatts.**

**And in India, which arguably has the most urgent need to decarbonise an energy system supplying one-point four BILLION people, there’s about five hundred square kilometres of mining wasteland that could provide twenty-seven gigawatts of new solar, equating to thirty-seven percent of existing capacity**

**Disused coal mines can be repurposed for something as small as a community project between one and five megawatts, plugging into local distribution lines to power schools and neighbourhoods, often with strong local support, all the way up to the very large utility-scale installations we’ve just been hearing about, that are typically larger than a HUNDRED megawatts, requiring transmission buildout and vast land preparation, and taking some time to get done.**

**But for coal communities, many of which have felt horribly left behind in recent years, these developments can radically transform their local economies into clean energy hubs. According to the GEM data coal-to-solar transitions like these could potentially create almost two-hundred and sixty-thousand PERMANENT jobs in manufacturing, wholesale trade and distribution, and professional services, PLUS an additional THREE hundred and eighteen-thousand temporary and construction jobs. Those two numbers combined are MORE than the number of workers that the coal industry is expected to shed globally by twenty-thirty-five. All it needs is for communities to embrace the change and make it work for THEM.**

**And of course, one of the biggest bonuses of these sites is that they’re already adjacent to existing grid infrastructure, including transmission lines and substations. The GEM team found that for recently closed mines, ninety-six percent were within six miles of a grid connection hub like a substation.**

**There’s also a massive environmental benefit in repurposing old mine sites. It’s not an easy task though says the GEM report. Clearing debris, scrap materials, or remnants of past industrial activity is required before work can safely begin. The slopes of deep SURFACE mines are often unstable and prone to erosion and collapse. Underground pits can fill with toxic runoff and coal ash, and other industrial wastes can leach into nearby waterways, becoming hazardous to the environment and to local communities left to live in the wreckage.**

**Reclaiming the land for solar projects stabilizes unsettled ground and typically restores healthier soil layers. And because the solar installation is an ongoing operation, the land has to be kept productive and safe, which tends to reduce the risk of erosion and runoff pollution.**

**So, in most cases, it looks like a coal-to-solar project could be a win-win for so many communities around the world who often feel completely abandoned by their governments.**

**On top of ALL that though, there’s a less well known, but equally significant CLIMATE benefit. And I’m sure many of you are way ahead of me here… it’s METHANE, or methane if you’re in North America.**

**The GEM report explains that when a coal mine is closed, the exposed coal seams and fractured rocks continue to leak methane into the atmosphere for years and years unless operators take proactive mitigation measures, which …you know.**

**And I’m sure we all know that cutting down on methane emissions is one of the fastest, most effective ways to slow global warming in the short term. But to give you just one example of the size of the problem,**

**9:51 this GEM analysis found that recently abandoned underground mines in the EU are currently collectively emitting nearly 9:58 TWO HUNDRED THOUSAND TONNES of methane EVERY year. 10:03**

**But if these reclamation projects are done correctly with the proper regulatory controls, then those long-term leaks can be addressed as a condition of the permitted development. Installing a solar farm typically requires covering the site with soil, gravel, or other materials to stabilize the ground and prevent subsidence. That process alone acts as a physical barrier, which reduces oxygen infiltration and seals up most of the pathways to air that methane gas currently seeps through.**

**So, while nobody is suggesting these kinds of projects are a walk in the park, they are nevertheless eminently do-able and a proven strategy already operating successfully in many parts of the world. If we’re to succeed in the goal of a one-hundred percent decarbonised global energy system in the coming decades, then we’re going to need solar panels on every available unused surface exposed to sunlight. Of course we need them on houses. Of course we need them on the roofs of industrial estates. And of course, we need them covering the myriad car parks that blight our urban environments, which by the way in the US alone is twenty-five THOUSAND square kilometres of land. That’s an area the size of Bill McKibben’s home state of Vermont!**

**But repurposing old COAL MINE SITES into ongoing operational solar power generation facilities could not only fix some nasty environmental issues but also bring some desperately needed gainful employment and dignity back to ordinary working families who had their livelihoods stripped away from them through no fault of their own. And I think that has to be something worth pursuing.**

**I’m sure there are challenges and issues that we haven’t discussed today, and I’m equally sure there will be positive anecdotal evidence of how these things can work in practice. So, if you’ve got experience of these conversions, or if you just have views on them one way or another, the place to leave your thoughts, as always, is in the comments section below.**

**That’s it for this week though. If you found this video useful and informative, then please do consider subscribing to the channel and clicking on all notifications so that you won’t miss any of my weekly episodes.**

**And you can also join the amazing group of folks over at Patreon who keep the lights on around here and enable me to keep ads and sponsorship messages out of your way. And I must just give a quick shout out to some folks who joined recently with pledges of ten dollars or more a month.**

**They are Chris Main, Paul Conway, Dermot McGovern, Stephanie, Keith Brant, Markus Rossmiller, Scott Alden, Donald Bigioni, Kenneth, Wiconi, Jeff Raimer, Stefanie Charren, Jim Croghan and Roy Sigurd Karlsbakk.**

**And of course a huge thank you to everyone else whose joined recently too.**

**You can have a look at what we get up to by going to patreon dot com forward slash just have a think or by following the link in the description section below.**

**Or if you’re watching on a tablet, smart phone, PC or Mac you can get there by clicking this link and you can subscribe to the channel absolutely for free by clicking here.**

**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.**