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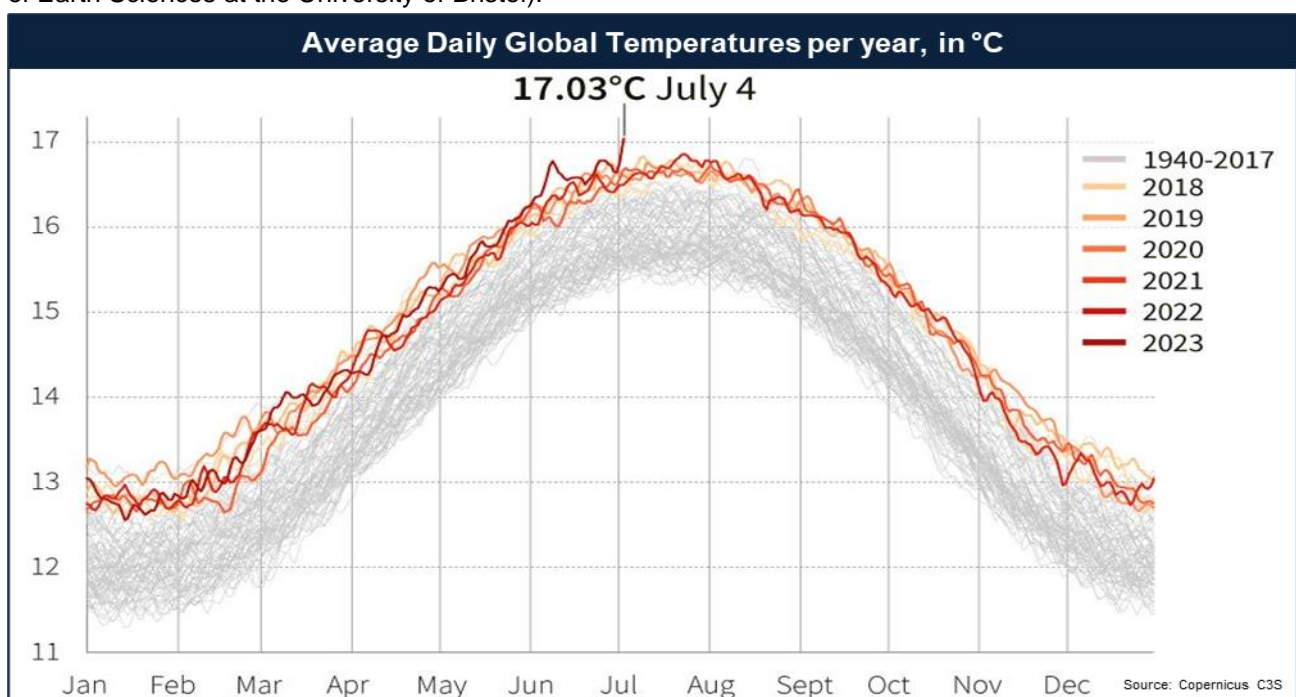
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Climate Change vs Energy Security

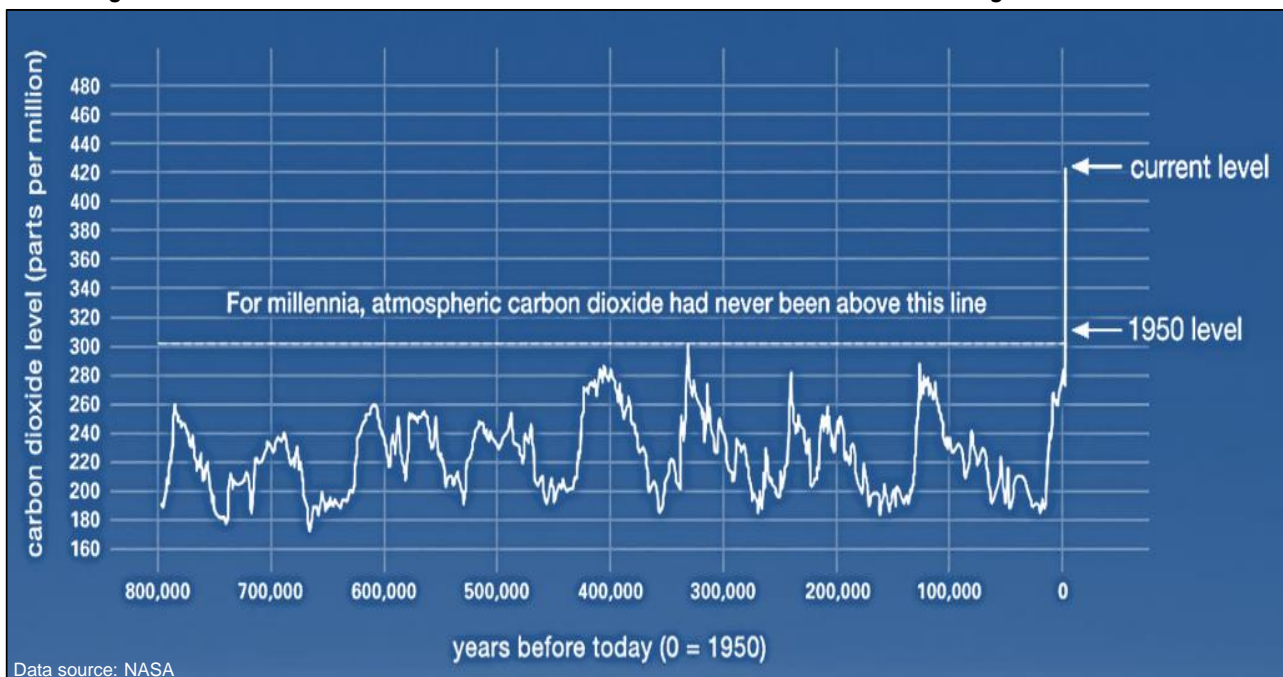
'Getting the balance right'

Reality Check

Although 97% of the world's climate scientists agree that humans are the primary cause of global warming and consequently climate change, there are still many people who believe that this is just another conspiracy theory. Perhaps they need to start looking more closely at the actual scientific data and last month's climate statistics alone may be a good place to begin. **Fact number one:** July 2023 was the hottest month on Earth since instrument records began. **Fact number two:** The first two weeks of July saw global surface air temperatures exceed 17 degrees Celsius, levels that have not been seen for around 125,000 years. **Fact number three:** The area covered by sea-ice in the Antarctic was at an unprecedented low for the month of July, while across in the Arctic, sea-ice coverage there is more than 1.30 million sq km below the 1981-2010 average, according to data published by the National Snow and Ice Data Centre at the University of Colorado. And finally **Fact number four:** The North Atlantic ocean is experiencing a marine heatwave for the first time in history, which in turn is having a major negative impact on marine ecosystems, the importance of this cannot be overestimated because such ecosystems produce 50% of the world's oxygen ([according](#) to the Department of Earth Sciences at the University of Bristol).



Naysayers also suggest that the climate has always gone through changes and claim that this time is no different, but, while it's completely true that the world's climate has gone through warmer and colder cycles throughout history, the difference this time is that the rate of change since 1950 is completely unprecedented. As NASA points out on its [website](#), *"It is undeniable that human activities have produced the atmospheric gases that have trapped more of the Sun's energy in the Earth system. This extra energy has warmed the atmosphere, ocean, and land, and widespread and rapid changes in the atmosphere, ocean, cryosphere, and biosphere have occurred,"* adding that *"ancient evidence reveals that current warming is occurring roughly 10 times faster than the average rate of warming after an ice age,"* while *"carbon dioxide from human activities is increasing about 250 times faster than it did from natural sources after the last Ice Age."*



In 1988, the respected former NASA climate scientist James Hansen, was the first high profile academic to raise the subject of global warming when he testified at a hearing in the US Senate. Last month, the 82-year-old professor together with two other scientists, Makiko Sato and Reto Ruedy, published a short-piece titled 'The Climate Dice are Loaded'. In it, the authors warn that the world has entered a new frontier with temperatures already higher than at any time over the past one million years, and bring with it more powerful storms, droughts, flooding and heatwaves. *"There's a lot more in the pipeline, unless we reduce the greenhouse gas. These superstorms are a taste of the storms of my grandchildren. We are headed wittingly into the new reality, and we knew it was coming,"* he was quoted as saying by The Guardian newspaper last week, adding that humanity's slow response to climate change over the past few decades means that *"we are damned fools, we have to taste it to believe it."*

Examples of this new reality continue to make headlines around the world and have been further exacerbated by this year's arrival of El Niño, a naturally occurring climate phenomenon but connected to ocean surface temperatures. From the 100,000 sq km of Canadian forests destroyed by fires so far this year (four times more than usual, and still burning) to record heatwaves across countries in South Asia, North Africa and Europe. The question is, how many of the thousands of residents and tourists who were forced to flee wildfires in Greece and inadvertently participate in the country's largest ever evacuation in modern history last month, have become climate change believers? Obviously, this is a difficult one to answer, no doubt some people will have but certainly not all, and this highlights the difficulty faced in getting the dangers climate change poses to a wider audience.

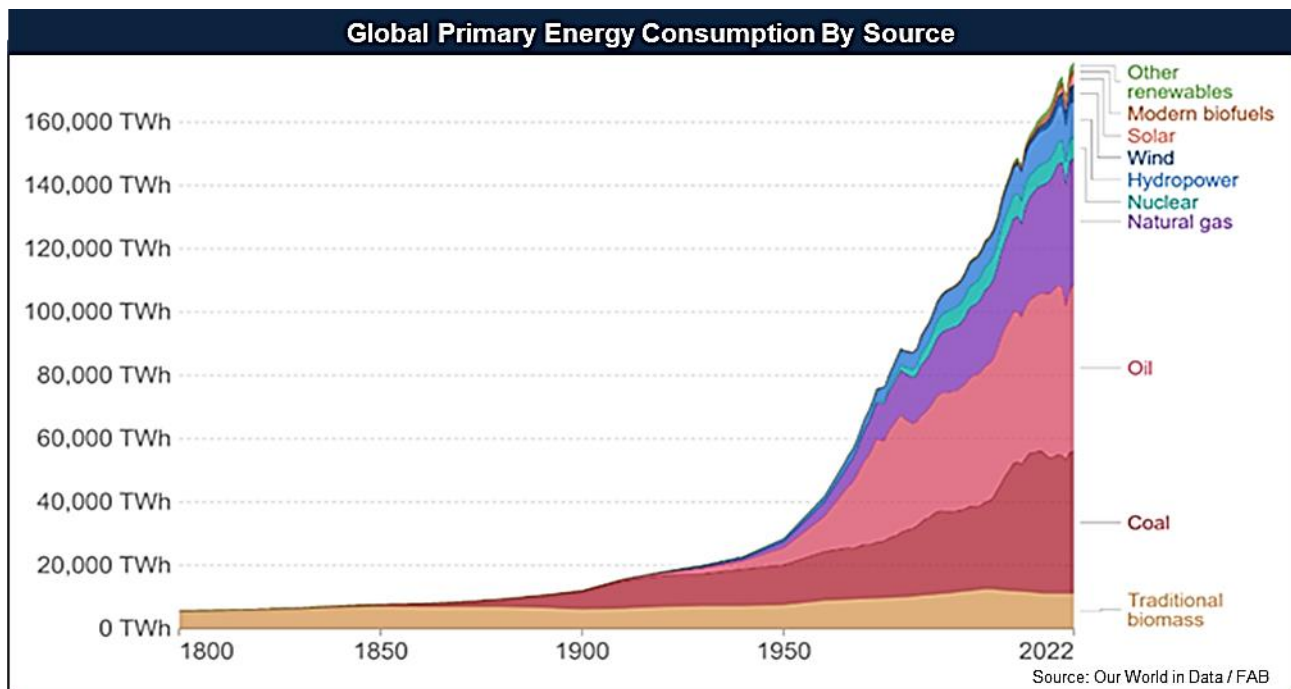
The self-styled 'Stop Oil' eco-warriors, disrupting daily life by blocking roads, damaging works of art and disrupting sporting events are not going to mobilize joe-public into supporting their cause, and are instead further alienating the majority by using such tactics.

So, how could greater awareness be achieved? A senior researcher at the Vanderbilt Institute for Energy and Environment, Alexander Maki, recently analyzed this communication issue and came up with five good [suggestions](#).

1. Matching the messenger to the audience is more effective, e.g. meteorologists & religious leaders.
2. Tailoring the message to match the audience's values.
3. Educating more people that there is broad scientific evidence on climate change.
4. Emphasizing the risks of failing to act, e.g. highlighting recent extreme weather events.
5. Counter misinformation by explaining why contrarian messages are flawed.

Transition Conundrum

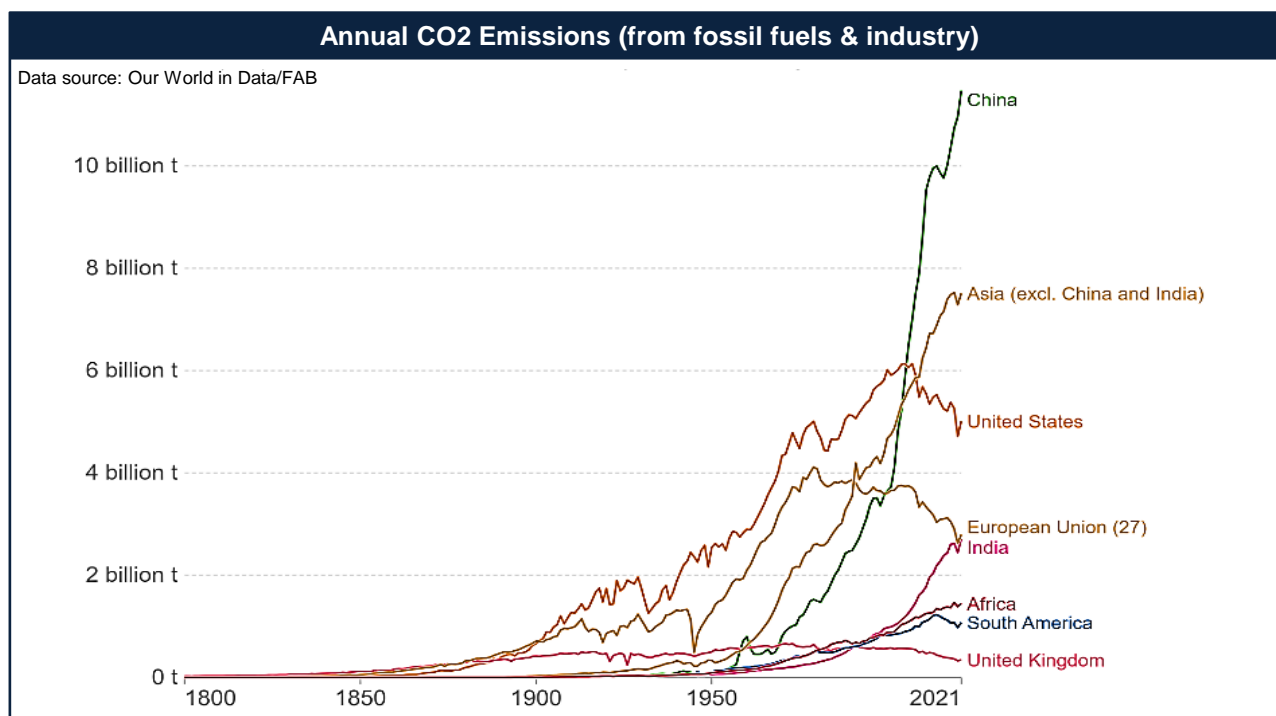
In the 19th century most carbon emissions were due to land-use change, but in the 20th century, rapid industrialization and the introduction of motorized transport saw the burning of fossil fuels become the main driver. Sharply reducing these emissions and transitioning to cleaner and renewable sources of energy is the answer to reversing or at least halting any further damage to the earth's climate, but the question is how to do this while avoiding a major disruption in global power supplies, especially in poorer countries.



As displayed in the chart above, fossil fuels still accounted for 77% of the world's energy mix in 2022 and this may only fall to 62% by 2050, according to a recent forecast by S&P Global. Meanwhile, although per-capita energy consumption may be peaking in several advanced economies, it's still growing in the developing world where population growth is at its most expansive. Economic growth is the only way to lift people out of poverty and herein lies the conundrum. Is it morally right to ask fast-growing emerging-market countries like India and Indonesia to abandon their current reliance on dirty fossil fuels like coal and, consequently, slow their economic expansion for a significant period whilst switching to green energy? Some might argue that it is, given that these Asian powerhouses are currently [ranked](#) in 3rd and 10th place respectively in terms of global carbon emissions, but what about those countries with much smaller budgets and resources such as Sri Lanka, Bangladesh, Pakistan, Malawi, etc?

As the Economist magazine recently pointed out, the developed world has been disproportionately responsible for rising global temperatures on a per-person basis and is more able to respond to them. The US alone pumped out more than 509 billion tons of CO₂ between 1850 and 2021, which is roughly 20% of the global total, according to the UK-based science website 'The Carbon Brief', with China in second place at 11% and Russia third at 7%.

Therefore, should the so-called rich countries provide more funding for renewable energy projects in the developing world? In June this year, the planet's richest nations pledged US\$100 billion per year to fund such projects, but this is still far below the estimated US\$2.80 trillion required by 2030 to help the developing world successfully transition their energy sources away from fossil fuels. However, assigning blame to specific countries is not straight forward, CO2 emissions are a side effect of economic development and allocating responsibility is further complicated by population size, wealth and carbon intensity.



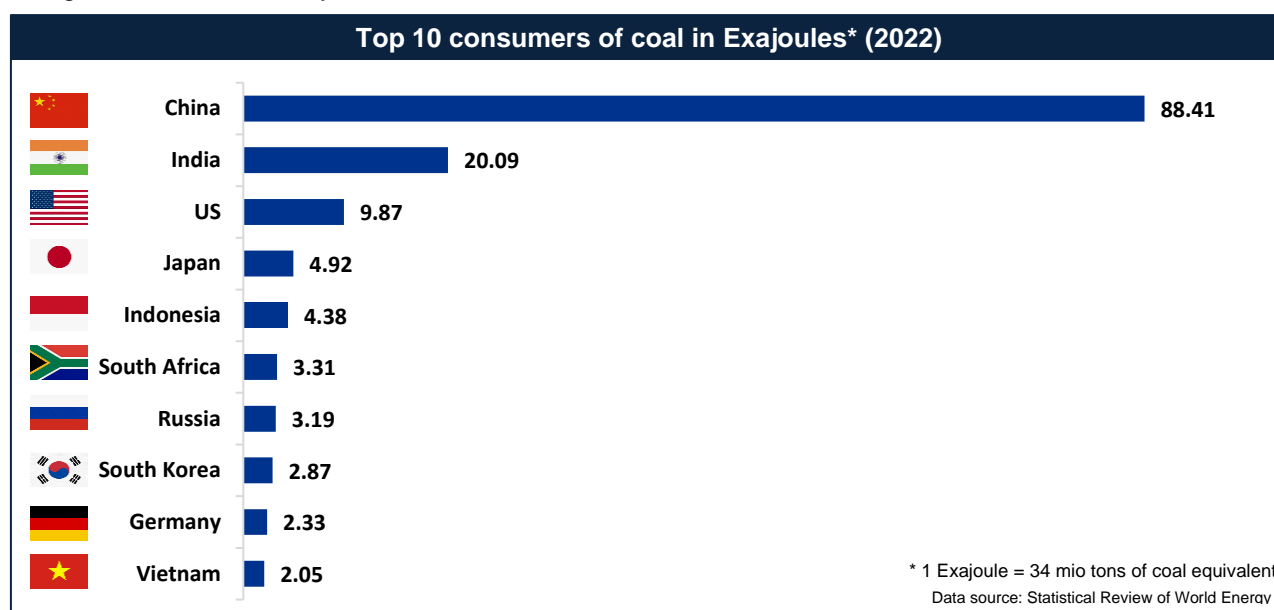
For example, while China overtook the US in the production of CO2 emissions in 2006, the Asian giant has the world's largest population and its economic transformation (which only began in 1978) has lifted more than 800 million of its citizens out of poverty and resulted in a significant improvement in their access to health and education. However, even though China invests far more into expanding its clean energy sector than any other country, including the US, it also continues to significantly expand its number of coal power plants. This is highlighted by the fact that the government approved proposals to develop 50.4GW worth of new domestic coal power capacity during the first half of 2023.

Perhaps the answer is getting the developed and developing world to collaborate far more closely on the issue of combatting climate change, with the former providing more financial and technological support and in return, receiving firm commitments from the latter on transition timelines. Reducing the use of the most polluting fossil fuels, like ordinary coal, as quickly as possible also makes sense if there are readily available alternatives available, even if it means switching to 'clean' coal, oil and/or gas as an interim measure while greener energy supplies are being developed and installed.

Earlier this year, the CEO of BP, Bernard Looney, highlighted the need for reliable and affordable power and the avoidance of volatile supply. *"Ask people today what they want from energy and the answer is more likely to be an energy system that works. An energy system that works is one that provides energy that is secure and affordable, as well as lower carbon. Action is clearly needed to accelerate the energy transition, and at the same time that transition has got to be orderly. We need to invest in the energy transition, and we need to invest in today's energy system, which is predominantly an oil and gas system,"* Looney was quoted as saying at a conference in February.

Coal is the most affordable fuel, but it also remains the world's largest source of energy-related CO2 emissions accounting for 44% of the total according to the IMF. Unfortunately, global coal-fired power generation reached an all-time high last year and accounted for more than a third of total electricity generation. In China and India, coal is the primary fuel source providing 55% and 70% of each country's electricity generation, respectively. Meanwhile in South Africa, energy supplies also come primarily from coal-fired power stations, with renewable sources such as wind and solar only accounting for 7.30% of the total energy mix in Africa's most developed economy last year.

Therefore, the major consumers of this fuel (as listed below) need to accelerate away to other 'cleaner' options such as natural gas. When burned, natural gas releases less than half the amount of CO2 produced by coal, and gas power plants do not release other dangerous pollutants into the environment such as sulfur dioxide, nitrogen oxide and mercury as coal-fired ones do.



Of course, getting the balance right in any country's energy transition is imperative, Europe's energy crisis in 2021/2022 may have been exacerbated by geopolitics, but it also highlighted the risks of a disorderly switch as electricity prices soared. At the same time, the Ukraine conflict clearly motivated Europe to end its reliance on Russian oil and gas, not only by finding new suppliers of these two commodities in the near term, but to also dust off previously mothballed clean energy options such as nuclear power, and to increase investment into renewable projects.

An African Solution

Africa is home to one sixth of the world's population and is a region of the world where the impact of climate change has been the most dramatic, from severe droughts to devastating flooding, which in turn is exacerbating an already fragile food security situation. Ironically, the continent itself only produces an estimated 3% of global carbon emissions, but at the same time, reliable and affordable power is desperately required for hundreds of millions of Africans. Energy poverty is currently extremely acute, and this was highlighted in recently published data by the IEA, which suggests that an estimated 620 million Africans (mostly in the sub-Saharan region) still do not have access to electricity, while roughly 730 million continue to rely on traditional biomass like wood for cooking. Energy poverty also results in poor physical and mental health as well as higher mortality rates as it limits access to clean drinking water, health care and proper education. Africa is blessed with tremendous natural resources, which, if managed more efficiently and effectively, could not only provide enough clean energy supplies for its own population, but also for export to the wider world. Over the years, three key hurdles faced by many African countries in developing their economic infrastructure have been war, bad governance and corruption.

However, the continent has also generally been left out of the energy transition up to now, especially when it comes to external investment. This was highlighted in a 2022 study undertaken by the International Renewable Energy Agency (IRENA) and the African Development Bank, which showed that only 2% of global investments into renewable energy over the past two decades were made in Africa. But things do appear to finally be changing, with several governments in Africa and beyond recently confirming their commitment to developing long-term power projects aimed at broadening the energy transition and promoting economic stability within Africa itself. For example, the UAE (which is currently the fourth largest investor in Africa) has recently been busy establishing a range of mutually beneficial commercial developments across the continent, including clean and renewable energy projects. One such program is the 'Etihad VII Initiative' which is a development fund launched by the UAE that aims to provide clean electricity to 100 million people across Africa by 2035.

The global accelerated push towards net zero since 2020 could therefore be a fresh opportunity for Africa to become a major force in renewable energy, with green hydrogen, wind, geothermal and solar offering the greatest potential. North Africa currently leads the continent in developing the latter resource, with Morocco's Noor and Egypt's Benban solar farms among the largest such facilities in the world, capitalizing on the region's ample hours of sunshine and readily available land. Morocco is also already exporting some of its solar-generated power to Europe via Spain and is in talks over a possible US\$22 billion megaproject, which, if approved, would see the installation of 12 million solar panels and 530 wind farms in the Guelmim-Oued Noun region, that in turn would eventually be able to provide the UK with 8% of its electricity needs through a 3,800km undersea cable.

Along the West African coast wind turbines are particularly appealing, especially as average wind speeds come in at around 6 meters per second. Meanwhile, the central and southern African region still has the opportunity to expand its hydropower capacity and is expected to benefit from recent new gas discoveries alongside the deployment of solar power. This region is also home to most of the essential minerals required to produce wind turbines' electric batteries and other low-carbon technology. In fact, IRENA believes that southern Africa's renewables market is set to become one of the continent's fastest growing over the next few years. Meanwhile, across in East Africa, Kenya is currently Africa's largest producer of geothermal energy, together with Ethiopia, but there are also a range of other projects underway in neighbouring countries such as a 120MW solar PV capacity rollout in Uganda.

Conclusion

The topic of climate change is vast and complex, but as we have tried to outline briefly above it is also the most important risk facing our planet, despite the controversy it continues to attract. Separating truth from fiction has become far more difficult in our 21st century world of lower attention spans and social media. However, if one takes the time to really digest what science is telling us, or even just pay attention to the rising number of unprecedented abnormal weather events each and every year, then it's pretty obvious that our climate is changing rapidly and not for the best.

At the same time, we need to also acknowledge that the much-needed energy transition from fossil fuels to renewables is not going to be achieved with a simple turn of the switch. An unstable and/or badly planned transition, could put humanity into an even more dire situation in the near term and therefore we will have to accept the fact, that conventional resources such as oil and gas are going to be needed for longer than we may currently wish. Such an enormous challenge also creates opportunities, but we are all going to need to communicate better and work closer together in order to achieve a healthy and prosperous future for ourselves and the next generation.

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Sources found to be useful in researching this article:

Atlantic Council, African Business, BBC, Bloomberg, Borgen Magazine, Brookings, Bristol University, CNBC, C-NET, Carbon Brief, Climate Analytics, Climate Trade, Down to Earth, Energy Capital Power, Energy Portal, FAO, Global Finance Magazine, Global Citizen, IEA, IMF, IRENA, Masdar, Mondaq, Nature, NASA, NSIDC, Our World in Data, Reuters, S&P Global Platts, SCMP, Sauer Energy, Scientific American, Statista, Financial Times, The Guardian, The Economist, The Wire, Vanderbilt Institute for Energy & Environment, The World Bank, Yale University, Zawya.

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