



THEIR VIEW

MINT CURATOR

# Finance is the binding constraint in efforts to fight climate change

A huge gap in the capital needed must be plugged and developing nations need mechanisms to attract private funds as well



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We are already seeing the consequences of global warming: Rising frequency of storms, floods and droughts; the adverse impact on agricultural production; loss of biodiversity; retreating glaciers, melting arctic ice, dying coral reefs and rising sea levels. The window of opportunity to avert the disastrous consequences of global warming beyond 1.5° Celsius above pre-industrial levels is rapidly closing. Some projections indicate that average temperatures are likely to rise well above 1.5° unless much more is done within the next 3-5 years to contain global warming (see Atul Bagai & Sudipto Mundle, *Hindustan Times* 26 April 2023). Fortunately, there has also been phenomenal progress in mitigation technologies. However, there are large variations in adoption across sectors and geographies even for mitigation technologies that are now commercially viable, mainly due to paucity of finance. Large amounts of capital are required to adopt these technologies at scale, but access to such finance is limited or altogether missing in many countries.

Among mitigation technologies, the most advanced is renewable power: solar, wind, etc. in addition hydropower, the original renewable. The cost of solar panels, wind turbines, storage batteries and other components have declined dramatically, such that the cost of renewable power is now comparable to fossil-fuel based power. Consequently, renewable power projects are now being rolled out at scale. Despite this, renewable energy still accounts for only around 15% of global power generation. Next, there is green hydrogen. Extracted by breaking down water molecules into hydrogen and oxygen through electrolysis, hydrogen has wide applications in hard to electrify sectors like heavy industries, shipping, air transport, etc. Hydrogen extracted using renewable power is green hydrogen. Apart from the power source, the cost of green hydrogen has been dependent on the cost of electrolyzers, which has been very high. As these costs have come down, green hydrogen has become commercially viable and is now attracting large-scale corporate investment, including in India. However, the rollout of green hydrogen at scale is just starting.

Third, we have carbon capture and sequestration (CSS). Renewable power and green hydrogen can minimize new carbon emissions but they cannot reduce the CO2 already suspended in the atmosphere, which accounts for the rising frequency of extreme weather events. To address this we need 'carbon negative' technologies to capture the carbon and store them till they can be broken down for commercial use. Existing CSS technologies are very expensive. Much investment is required in research & development (R&D) to reduce costs before CSS technologies become commercially viable.

The fourth group of technologies, still mostly

experimental, replicate and improve 'technologies' available in nature to capture carbon from the atmosphere and use it productively. Plants use 'photosynthesis' to feed on CO2 captured from the atmosphere, while releasing oxygen in exchange. Terrestrial and under water forests are the natural 'carbon sinks' that contain the carbon load in the atmosphere. But the level of emissions has gone far beyond the capacity of natural 'carbon sinks' to absorb the additional carbon load. Huge R&D investment is required to develop technologies to synthetically replicate and enhance the capacity of natural carbon sinks multiple times to reduce the ambient carbon load and eventually reverse global warming.

The key takeaway from the foregoing is that vast amounts of capital are required to successfully address the climate crisis. Investment is required primarily for R&D in CSS technology and synthetic replication of natural carbon sinks and also to roll out renewable energy and green hydrogen projects at scale. Indeed, these projects are already being rolled out, but not at anywhere near the scale required to contain and eventually reverse global warming. The United Nations Environment Program *Emissions Gap Report 2022* estimates that current annual investment in climate finance of about \$571 billion needs to rise to at least \$1.7-2 trillion.

How can this be financed? Global public sector finance is an obvious option to finance a global public good. However, discussions following the report

of the G20-appointed Independent Committee to Review the Multilateral Development Banks' (MDBs) Capital Adequacy Framework indicate that MDBs may at best generate additional assistance of \$1 trillion for all purposes, including climate finance. There is much scepticism even about this amount. The alternative is private capital, a stock which is estimated to be growing by about \$15 trillion annually. However, most of this capital originates in advanced countries and would not readily

flow to tropical developing countries that have the greatest potential for renewable power generation.

Inducing private capital flows towards climate finance in developing countries will require, first, the creation of a suitable ecosystem including universally accepted concepts, definitions and standards for climate finance, appropriate rating systems and technical assessment methodologies (see Ajay Sagar, *Business Standard* 27 March 2023). Second, it will require considerable de-risking of such private capital flows, along with its

attendant moral hazard (V. Anantha Nageswaran, *Mint*, 11 April, 2023). MDBs can play a crucial role here despite their limited resources by providing credit guarantees (Ajay Chibber, *Atlantic Council*, 17 October 2022). That way, their own investments can be leveraged 10-20 times to mobilize private capital while minimizing the moral hazard of de-risked private investment through their own due diligence.

*These are the author's personal views.*

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It's a relief that we have varied climate mitigation solutions available now but these require large amounts of capital that less developed countries find themselves acutely short of.

Public money is insufficient in itself but multilateral agencies can act as guarantors to de-risk private capital even as a broader ecosystem is put in place for climate finance to reach all.

# ChatGPT's secret weapon may be its ability to feign empathy

It's better on artificial emotional intelligence than factual accuracy



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ChatGPT can beat humans on emotional intelligence tests

Earlier this year, Princeton Computer Science Professor Arvind Narayanan set up a voice interface to ChatGPT for his nearly four-year-old daughter. It was partly an experiment and partly because he believed AI agents would one day be a big part of her life. Narayanan's daughter was naturally curious, often asking about animals, plants and the human body, and he thought ChatGPT could give useful answers to her questions, he said. To his surprise, the chatbot developed by OpenAI also did an impeccable job at showing empathy, once he told the system it was speaking to a small child.

"What happens when the lights turn out?" his daughter asked. "When the lights turn out, it gets dark, and it can be a little scary," ChatGPT responded in a synthetic voice. "But don't worry! There are lots of things you can do to feel safe and comfortable in the dark." It then gave some advice on using night lights, closing with a reminder that "it's normal to feel a bit scared in the dark." Narayanan's daughter was visibly reassured, he wrote in a Substack post.

Microsoft and Google are rushing to enhance their search engines with the large language model (LLM) tech that underpins ChatGPT, but there is good reason to think the technology works better as an emotional companion than as a provider of facts. That might sound weird, but what's weirder is that Google's Bard and Microsoft's Bing, which is based on ChatGPT's underlying technology, are being positioned as search tools when they have an embarrassing history of factual errors: Bard gave incorrect information about the James Webb Telescope in its first demo while Bing goofed on a series of financial figures in its own.

The cost of factual mistakes is high when a chatbot is a search tool. But when it's a companion, it's much lower, according to Eugenia Kuyda, founder of AI-companion app Replika. "It won't ruin the experience, unlike with search where small mistakes can break the trust in the product."

Margaret Mitchell, a former Google AI researcher who co-wrote a paper on the risks of LLMs, has said these are simply "not fit for purpose" as search engines. LLMs are error prone as the data they're trained on includes errors and cannot verify truth. Their designers may also prioritize fluency over accuracy. That is why these tools are exceptionally good at mimicking empathy. After all, they're learning from text scraped from the web, including emotive reactions posted on social media platforms, and from users of forums like Reddit and Quora. Conversations from movie and TV show scripts,

dialogue from novels, and research papers on emotional intelligence all went into the pool to make these tools seem empathetic. No surprise then that some people are using ChatGPT as a robo-therapist. As reported, one person said they used it to avoid being a burden on others, including their own human therapist.

To see if I could measure ChatGPT's empathic abilities, I put it through an online emotional intelligence test, giving it 40 multiple choice questions and telling it to answer each question with a corresponding letter. The result: It aced the quiz, getting perfect scores in the categories of social awareness, relationship management and self-management, and only stumbling slightly in self-awareness. ChatGPT did better on the quiz than I did, and it also beat a colleague, even though we're both human and have real emotions (or so we think).

There's something unreal about a machine providing us comfort with synthetic empathy, but it does make sense. Our innate need for social connection and brain's ability to mirror others' feelings mean we can get a sense of understanding even if the opposite party doesn't 'feel' what we feel. Inside our brains, 'mirror neurons' fire when we see empathy from others—including chatbots—giving us a sense of connection. Empathy, of course, is a multi-faceted concept, and for us to truly experience it, we arguably need another warm body to share feelings with. Thomas Ward, a clinical psychologist with Kings College London cautions against assumptions that AI can adequately fill a void for people who need mental health support, particularly if their issues are serious. A chatbot for instance, probably won't acknowledge that a person's feelings are too complex to understand. ChatGPT, in other words, rarely says "I don't know," because it was designed to err on the side of confidence.

More generally, people should be wary of turning to chatbots as outlets for feelings. "Subtle aspects of the human connection like the touch of a hand or knowing when to speak and when to listen, could be lost in a world that sees AI chatbots as a solution for human loneliness," Ward says. That might create more problems than we think we're solving. But for the time being, they're at least more reliable for their emotional skills than their grasp of facts. ©BLOOMBERG

MY VIEW | PEN DRIVE

# There's a case for small electric cars on Indian streets

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I recently asked a senior executive at a leading SUV maker in India for an opinion on a tiny two-door electric car that has just been launched in the country. "In India, people are very conscious of their status. Do you think you will ever take this small car to a wedding in your family, with your mom and dad packed away in the back seats, and awkwardly get out of a two-door car in front of your relatives?"

If I was being honest with myself, probably not. Most certainly not. And a small electric micro-car, smaller even than a Tata Nano, isn't meant for that purpose either—you don't pack away your family of four in a car like that to attend a wedding or go out of town. But if one were to flip this question around, how sensible is it to take your 7-seater SUV for your grocery run, pick up your kids from class, or go shopping? Not much, but how often do we see that happening? All the time, which goes on to prove that the senior executive did have a point—a car

is a vanity purchase for most Indian families. Even in China, buyers are obsessed with exorbitantly large cars. So much so that vehicle makers make special long-wheelbase iterations of popular luxury models just for China. India, until recently, was known to be a small-car market dominated by Suzuki, a popular maker of the 'kei car' or 'k-car' in Japan, which refers to a small, light vehicle that can zip through small urban spaces with ease and leave a lower carbon footprint. But we're starting to mimic an obsession of the Western and Chinese markets with big fuel-guzzlers. To be fair, they can traverse harsh terrains much more confidently than a small car. And they do give the driver a sense of command on the road. What's not to like?

A friend and editor of a popular auto magazine says that people in India don't buy a car for 99% of their use cases, but for the 1% use case that they'll hardly ever find themselves in. Take a look around the next time you're stuck in peak-hour traffic, check all the cars within sight for the number of people in them, and you'll know how true that is.

The question, however, is whether that's the best option for our cities notorious for hours-long gridlocks and road infrastructure that is woefully inadequate for this volume of

traffic. MG Motor India, while marketing its two-door micro EV Comet, talked about how 70% of people in a vehicle travel solo. In that case, how practical is it from an economy, efficiency, environment and congestion point-of-view for a solo traveller to use a big vehicle in a city? In cities like Delhi, and increasingly Mumbai too, air pollution is a serious health hazard, and larger vehicles generally pollute more. The trajectory of fuel prices is also headed upwards—which means they're not light on your pocket either.

Another issue is the lack of parking facilities in big cities, where there is extreme pressure on parking, given a limited supply of spaces. Illegal and haphazard parking, which makes congestion worse, particularly in commercial and residential areas, only adds to the problem. Additionally, we have no road-pricing policies of the kind seen in London, for instance, which could help reduce peak traffic

and encourage the use of public transportation or other sustainable modes of transport.

So a small Lego-car-like EV, such as the MG Comet, is likely to hold appeal. Less than 3 metres in length, the manoeuvrability it offers you in tight urban spaces is matchless. You can get into tight corners and park with ease. Besides, it has all the gadgetry you need to make your city commute practical and fun—large floating displays, ample storage space if you're driving solo or with a co-driver, and an infotainment system that cuts the clutter but wouldn't leave you wanting. Sure, it will rudely remind you of its smallness each time you drive over a pothole or speed bump. But it gives you a practical 200km range, which can give you an average cost of running as low as ₹519 a month in an EV that occupies much less space than even a typical hatchback. That is a solution India's congested cities need, but might not

Micro-sized EVs may not make a good first impression but their suitability in our gridlocked cities and decent driving range make good sense and offer a pragmatic alternative to big fuel guzzlers.

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India was once known to be a small car market but now seems headed the way of the West and China, taking a fancy for large fuel guzzlers as we increasingly treat cars like vanity purchases.

Micro-sized EVs may not make a good first impression but their suitability in our gridlocked cities and decent driving range make good sense and offer a pragmatic alternative to big fuel guzzlers.

necessarily be ready to embrace. However, at a ₹8 lakh starting price, it is significantly more expensive to buy than a regular petrol-run hatchback.

College-going youngsters certainly don't find micro EVs fancy enough, but middle-aged people who have done their big car-flex in their younger years could find value in a cute-sized car like this. Even senior citizens who prioritize ease of driving over the muscular road presence of a large car may find it a sensible buy.

We've seen cars like this before: the Reva and the e20 were both small electric cars, but didn't work because they were ahead of their time and had fairly impractically low driving ranges. EVs are now in the conversation of many affluent urban Indians. And perhaps it's time for our car-buyers to take a lead on adopting eco-friendly solutions for our gridlocked roads.

The Comet's boxy design and two-door format even for a plush-looking car, though, may prove polarizing. Your first instinct may be to dismiss micro EVs as a fad, or toy cars, but I urge you to get behind the wheel and weigh your options. China, with one million such EVs already on its roads, is already a convert. Maybe India can be next.