THE HARBINGER

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The Shifting Sands

CLIMATE FINANCE

What the future has in store for the economy

RENEWABLE ENERGY

The way forward

SOCIO-POLITICAL IMPACT

We're all in the same boat

SHARANYA

Preface

"We don't have time to sit on our hands as our planet burns. For young people, climate change is bigger than election or re-election. It's life or death."

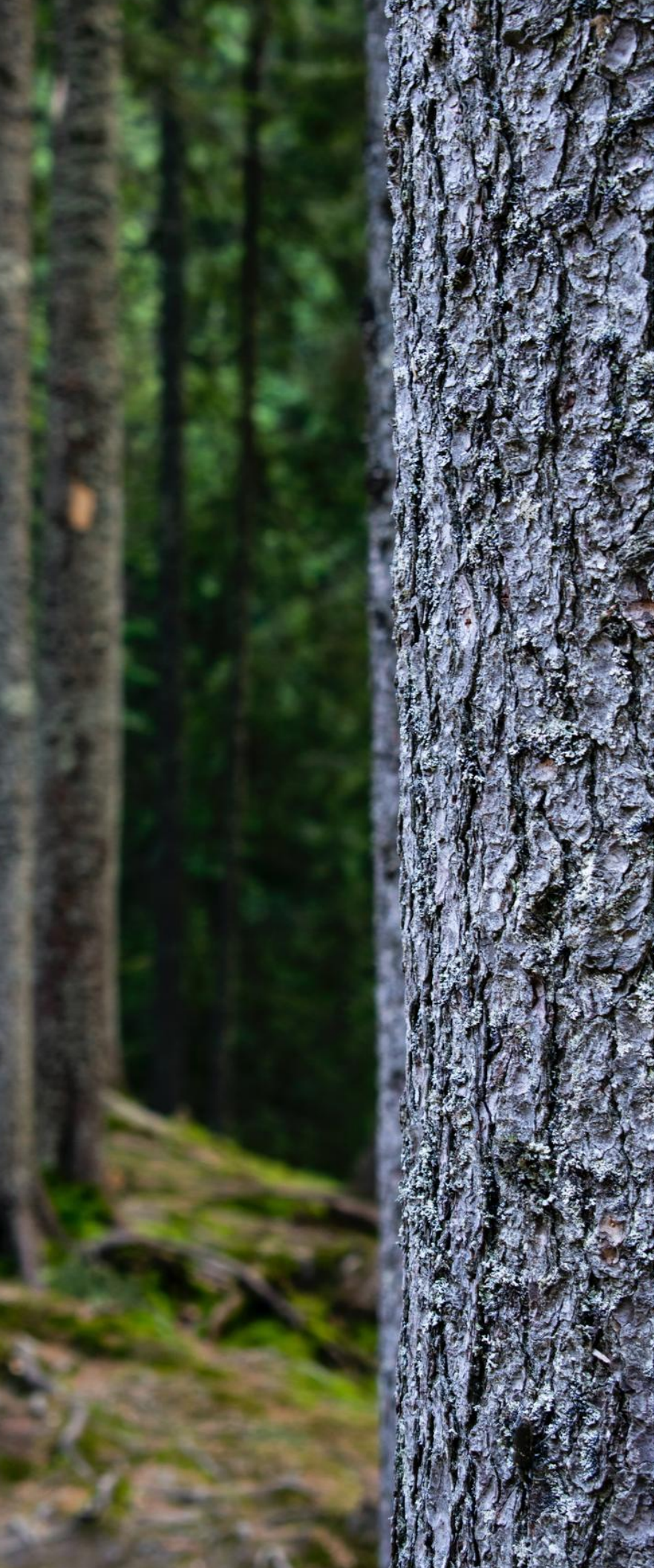
~Alexandria Ocasio-Cortez

A Harbinger is someone or something that paves the way for the future, and is a beacon for change and eternal hope. We hope this serves as a common ground for people to come together and learn stuff that goes on in the real world in their area of interest. The readers can expect information and hypotheses about recent developments and help make a flame out of the spark of interest in the students-true, precise, basic information about things that matter.

Before the COVID pandemic, millions of young people took to the streets to force decision-makers to understand the climate crisis we are facing. While protests had to go digital over the last several months, it does not alter the fact that the issue of climate change is as pressing as ever. Climate change is all around us and we will be the generation facing its impact to the maximum, so we decided to tackle this issue in our inaugural edition. Awareness and commitment will be of the essence for a shared future on this planet. We believe the journey in this direction can begin by building a strong knowledge base with respect to our opportunities and threats. This is our attempt at awakening interest in this topic and delivering relevant information on the same.

With the world in covid's grip, we hope this journal will be a breath of fresh air. The primary focus of news today is documenting the virus's spread. The Harbinger sheds light on developments, unnoticed yet ground-breaking. In this maelstrom of confusion, we hope to provide some buoyancy.

~ The Editorial Team



IN THIS ISSUE

Why We Need Renewables

~Aditya Wakchoure

Earth Overshoot Day marks the date when humanity has exhausted nature's budget for the year. For the rest of the year, we are maintaining our ecological deficit by drawing down local resource stocks and accumulating carbon dioxide in the atmosphere. In 2020, due to the covid pandemic, Earth Overshoot Day was delayed by a month and fell on the 22nd of August. We are operating in overshoot.

Today, the world still heavily relies on fossil fuels and even continues subsidising them. Meanwhile, the pollution they cause – from climate-damaging greenhouse gases to health-endangering particles – has reached record levels. And when something goes wrong, for example when the Deepwater Horizon oil platform exploded in 2010 or the recent oil spills in Mauritius, the consequences are dramatic.

There is an unprecedented momentum for leaving the fossil fuel age behind us. And we must do it now.
So, what would a more sustainable world powered by renewable energy look like?

We have a better sense, thanks to a special collection of research from experts from around the globe. Collated by Stanford University, a collection of 47 peer-reviewed research papers by 91 authors analysed different scenarios to examine whether individual countries or entire regions could get by solely relying on renewables.

The papers look at a range of different situations and geographies, including small island states, major powers and countries in sub-Saharan Africa. In each case, they found energy for electricity, transport, building heating or cooling, and industry can be supplied reliably with 100% — or near-100% — renewable energy, at different locations around the world.

Nine out of every 10 people on the planet breathe polluted air, according to the World Health Organization, and switching to wind, water and solar worldwide could eliminate 4 to 7 million deaths from air pollution annually. Mitigating the impact of climate change also means fewer floods, storms, droughts and other extremes caused by warming temperatures.

The Current State of Renewables in India

~Aditya Wakchoure

This fact is not hidden from anyone that India is the world's fourth-largest carbon emitter with its population of 1.3 billion people. But in recent years, India has made significant strides in the renewable energy space. Strong government support has pushed India to be one of the world's most attractive renewable energy markets. The government has designed policies, programs, and a liberal environment to attract foreign investments to ramp up the country in the renewable energy market at a rapid rate. Wind energy capacity in India has increased by 1.7 times in the last 4 years. Further to this, **a record 100 billion+ units of renewable electricity were generated last year.** Solar power capacity has increased by more than 11 times in the last five years from 2.6 GW to 28.18 GW in March 2019. 42 solar parks of aggregate capacity 23,499 MW had been approved in 17 states up to March 2019. Currently, the total installed capacity for Renewables in India is 87+ Gigawatts, but the country has set an ambitious target of 450 GW of renewable power by 2030. This is the world's largest expansion plan in renewable energy, and it is anticipated that the renewable energy sector can create a large number of domestic jobs over the following years. With 300 clear sunny days a year, over a dozen perennial rivers, a coastline of more than 7,500 Kms, and the largest deposits of Thorium in the world, we have a lot of potential...

The Future Of Renewables

~Shaarang Sawale

Yeah, solar panels and windmills are amazing, but what if we could harness the Sun?

Do you ever think what it would be like to harness the energy of the sun, here, on earth? Stop thinking; because, that's going to be a reality soon. After 35 years, 20 billion dollars, and a lot of research by thousands of scientists from 35 nations, this international project has real potential to be successful. ITER is the first device that will produce clean, carbon-free net positive energy by maintaining fusion for long periods of time. Although fusion has existed for some time now, it's never even considered as a huge and clean source of energy. This can change our character we, as humans, associate ourselves with. Mimicking the processes of a star that fuels an entire solar system, here on earth, is a really big step for mankind.

Another inadvertent boon of this project is international cooperation and harmony. China and USA, Russia and USA, India, China; all in one project. Co operating in peace? If this isn't stranger than fiction, I don't know what is. It's so soothing to just know that countries that were once at war and some that still are, have found a common ground, put aside their differences for the development of science and are now working in harmony.

Also, India plays a very crucial role in the project. In some ways India is the backbone of ITER. The contract for all the structural support for the power station, the cryostat and the reactor was given to L&T (Larsen & Toubro), Gujarat.

You're probably thinking about the world after ITER and what major changes would occur. Well, it would be safe to assume that more projects like ITER (possibly larger) that use more advanced tech and programming will follow. DEMO/PROTO is the machine that will bring fusion energy research to the threshold of a prototype fusion reactor. After ITER—the machine that will demonstrate the technological and scientific feasibility of fusion energy—DEMO will open the way to its industrial and commercial exploitation. While it is too soon to say if DEMO would be an international collaboration like ITER, it is evident that different conceptual DEMO projects will be considered by all member nations of ITER.

ITER was originally an acronym for International Thermonuclear Experimental Reactor but was later rebranded as iter (latin for "the way")

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1.Thorium Energy World

BARC has said it is more efficient to first convert Thorium-232 into Uranium-233 and then use that to fuel the reactor. India's new nuclear programme has three stages with it's first PFBR (prototype fast breeder reactor) being built at Madras Atomic Power Station in Kalpakkam as the main nuclear reactor. It also produces – or 'breeds' – more plutonium-239. Ultimately, these reactors will burn uranium-233 and convert thorium-232 to more uranium-233, creating a self-sustaining cycle of nuclear power generation. The designs of the FBR and the PFBR have, since their conception, been reviewed by many peer groups and research teams led by IGCAR and BARC scientists and it is now the best version of itself. India now has new hope for catching up with the nuclear programmes of the world.

2.Concentrated Solar Power

Concentrated solar power uses intricate contraptions of mirrors and lenses to concentrate sunlight onto a receiver generating steam, driving a turbine to produce electricity.
The most common and effective system is the power tower system where a number of mirrors are arranged in concentric circles around a tower with a central receiver on the top that can get to a temperature of about 600 degree centigrade.
There are other systems like Parabolic Trough, Linear Fresnel and Parabolic Dish.This is a fairly new and innovative source of energy that is on its rise to abundance

3.Geothermal energy

Useful for heating and cooling systems in homes and industrial units,this source of energy uses the difference in temperature between different layers of large water bodies. Heat exchangers and heat pumps are used to meet heating or cooling needs and then circulated.
This system is widely used in France. A company called Engie is responsible for 80% of the geothermal energy in the network. It produces around 100GWh of green heat energy which is enough for the needs of 10000 homes. This system has reduced CO2 levels by 1.1 million tonnes every year compared to conventional air conditioning systems.

Climate Finance

~Aarya Sabnis

While climate change is known to pose a range of risks to business and the world at large, the Global Opportunity Report 2017 identified cost-efficient adaptation to climate change as one of the best opportunities for business. Conventional tools of economic planning and development do not recognize environmental costs. However, for sustainable development, we need to account for the damage we cause to the environment while incentivizing businesses to reduce their carbon emissions and reprimanding them for excess emissions. There are several ways to execute this:

Carbon tax

The Government currently levies Rs. 400/tonne tax on carbon dioxide emitted by companies. However, this amount is very low in comparison to global standards and the subsidies on fossil fuels far outweigh the subsidies to renewable energy companies. A report estimated that a carbon tax @ $ 35 per tonne of CO2 emissions levied by India in phases from 2017 to 2030 can yield more than 2% of GDP, thereby compensating the loss from taxing fossil fuels. India's state-owned company, Coal India, tops the list of businesses with largest greenhouse gas emissions—2076.2 million tonnes. This shows the need for decisive action to reduce carbon emissions.

Carbon Credit Trading

Carbon credits are traded in the futures markets by companies in India. India and China have a surplus of such credits and these are generally bought by European countries The NITI Aayog has also said that India can further access carbon credits worth USD 50-60 bn if it propagates agroecology. A lot of companies have made profits from this program. Gujarat Fluorochemicals Ltd is one of the pioneers in the country to invest in CDMunder the Kyoto Protocol by cutting down carbon emissions. The company has successfully implemented a CDM Project which earns carbon credits. Because of this, it has been observed that an increase of approximately 44% in the valuation of the GFL is owing to the revenue from the sale of the carbon credits as per the Kyoto Protocol.

Internal carbon pricing

Companies use internal carbon pricing as a strategy to manage climate-related business risks and prepare for a transition to a low-carbon economy. Internal carbon pricing generally takes multiple forms, most common of which are:
An internal carbon fee is a monetary value on each ton of carbon emissions, which creates a dedicated revenue or investment stream to fund the company's emissions reduction efforts. An implicit price is based on how much a company spends to reduce greenhouse gas emissions and/or cost of complying with government regulations.

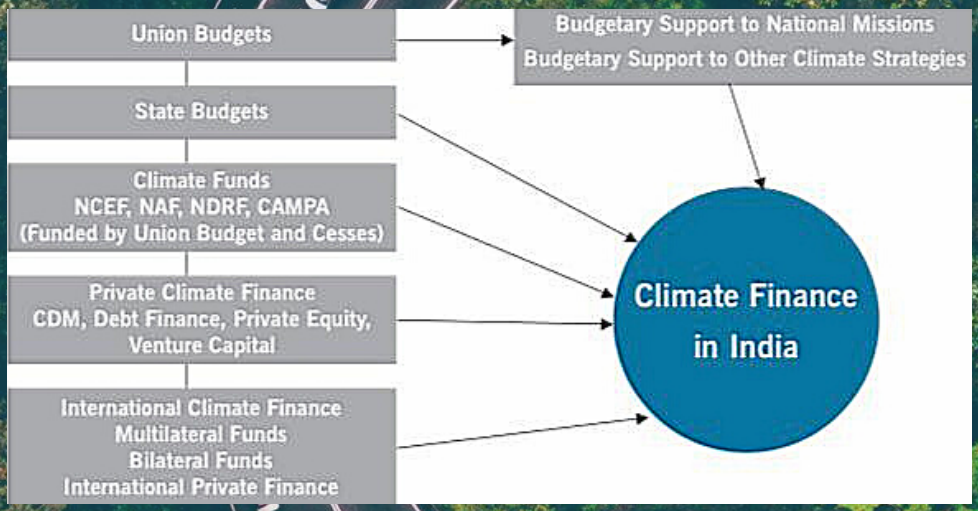
"SUSTAINABLE DEVELOPMENT IS NOT ONLY AN OPTION BUT THE ONLY OPTION FOR A SHARED FUTURE ON THIS PLANET."

~Rebecca Grynspan

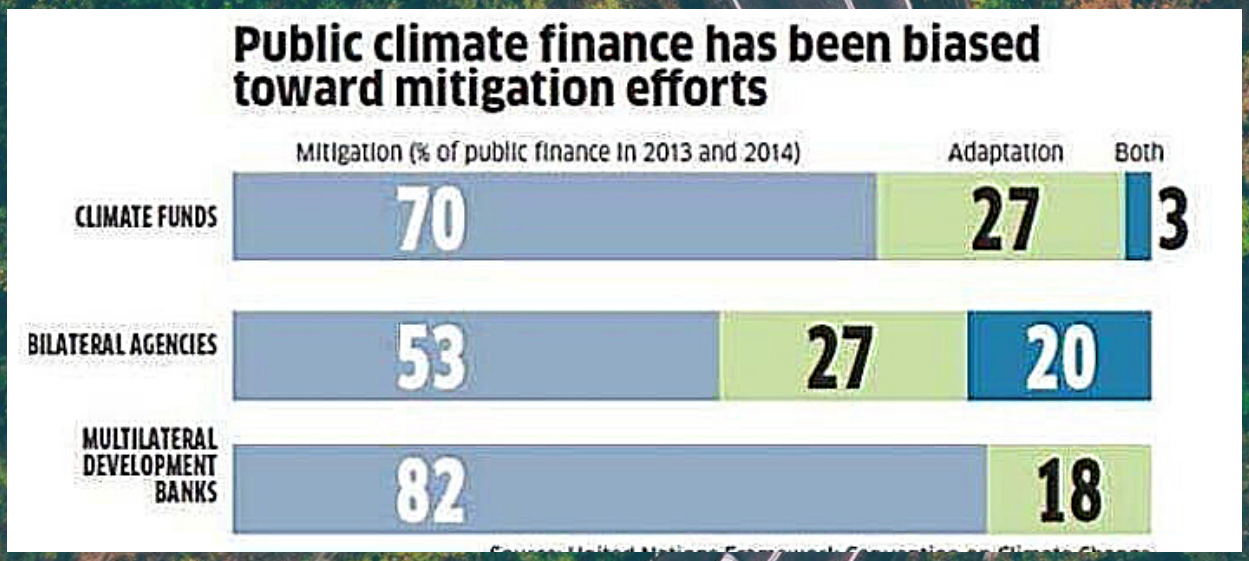
However, while the current policies and measures are a step in the right direction, there exist several problems. The carbon tax is so low that rich companies can easily pay this amount and continue emitting harmful gases. There is no effective infrastructure to ensure that companies are reporting the same amount of carbon as they are emitting. The growth rate of coal and fossil fuel industries remains far more than that of renewable sources although India has great potential to develop renewable sources. Several solutions to the current problems include decreasing fossil fuel subsidies be the solution to this problem along with increasing carbon tax, setting up a body that conducts regular inspections at business sights and incentivizing them to adopt carbon pricing. Above all, the issue of balancing economic gain with environmental impact requires commitment, accountability and priority from the business world, the Government and the public. After all, as said by UN Deputy Chief Rebecca Grynspan, "Sustainable Development is not only an option but the only option for a shared future on this planet."

The Indian Perspective

~Aryan Vanjani



Climate Finance in India can be distinguished into public and private. Public climate Finance is in the form of budgetary outlays (both at the national and the sub national level), tax, subsidies and government backed market mechanisms. Private climate Finance exists in the form of loans (local and foreign currency loans), private equity, venture capital, partial risk guarantees, green bonds and Clean Development Mechanism (CDM). Apart from these sources, international funds, multilateral development banks and bilateral Financial institutions also provide climate Finance



The largest source of climate financing in India is public funding, which is routed through budgetary allocation and several funds and schemes related to climate change established by the Government of India such as National Clean Energy Fund (NCEF) and National Adaptation Fund (NAF) .The Government of India also provides funding through eight missions established under the National Action Plan for Climate Change.

International Implications

~Aarya Gandre

The day of 4th November, 2016 saw a collaboration of 195 nation states in the world coming together, in New York City, to pledge the solidarity of us people to secure, to better and to consolidate the efforts being made to free our planet Earth of the overwhelming harassment it faces due to the exploitation of its natural resources. It was the day of signing of the Paris Agreement. A treaty, the first of its kind, to assert a political step towards mitigating the menacing impacts of climate change.

One of the most pertinent measures that the treaty highlights is the irrefutable urgency of climate finance. This being what brings us to our topic, and also the relevance of the social, political and trade impacts that such an initiative of climate financing can entail. After all, the treaty is first and foremost a political tool that has brought such an idea into effect.

Of course, the first few conspicuous changes that come to mind are the absolute revamping of the automobile and cosmetics industry; as the development of petroleum and oil and gas will continually go on diminishing. The automobile sector has since long been showing ambitious plans for its future as it undergoes the extreme shifts towards complete automisation as well as its emphasis on electric cars. With automobile giants such as Honda, Hyundai, Toyota, Mahindra, Nissan, and of course, Tesla; already projecting absolute mass production of electric cars by 2030.

Other than the everyday altercations, one of the primary causal political impacts that climate financing brings us to, is the decreasing reliance of the economies on the 'oil rich' countries in the world. As each country becomes increasingly self-reliant for its energy consumption an production. For a stronger emphasis to this point, we would like to illustrate it with an example of the incumbent status of Morocco. The North African Mediterranean country has recently overturned its industrial policies in favour of development of its gargantuan reserves of potential renewable energy in terms of solar, wind and hydropower projects. In 2011, 95% of the country's energy requirements were dependent oil, gas and coal imported from the MENA and Russia. But now, as of 2018, the UN Framework Convention Of Climate Change has reported about 45% of Morocco's energy assets to have gained impetus from the renewable sectors or solar and wind. This, despite promising tremendous growth in terms of energy for Morocco, also reduced 3.7 million tonnes of CO_2 emissions for the year of 2017, and saved about $13.4 billion in oil and gas imports. Furthermore attracting private investments for renewable power production.

The model was further followed by other countries like China, Brazil, Chile and Germany as well. It also serves as a viable example for India as it develops its 'Make In India' program. India being a trillion dollar economy is on its inevitable path to play a seriously pivotal role in attraction of investment for its hydro and solar power projects.Although the Finance Initiative has seen several such positive outcomes, from countries to the likes of India, China, Brazil, Morocco, Japan, UK, Germany, France, Ghana, Senegal to name a few; the UNEP "Green Economy" report 2019 highlights that the need to act on enhancing action on climate mitigation is even more urgent. Unless the global greenhouse gas emissions fall by 7.6 percent each year between 2020 and 2030, the world will not be on track to meet the 1.50C temperature goal of the Paris agreement.

At the same time, this might be a promising and unequivocally welcome initiative, the execution of the treaty has sustained several setbacks in the past few years itself.
USA's withdrawal from the Paris Agreement in 2017 by the Trump administration, builds a rising case of alarm as, the US was one of the major contributors to the operational facilitators of the Finance Initiative with promising commitments of about $50 billion in the first five years itself. Although the American Congress has still somewhat fitfully been able keep up its financing for mitigation of climate change, the executive decisions by the Trump administrations have still proved to be counterproductive to the plan.
These are some of the areas which still demand tending to, but nevertheless do no significant damage in blemishing the idea that climate change is an existential crisis being endured by mankind. And that it needs decisive and resolute action.

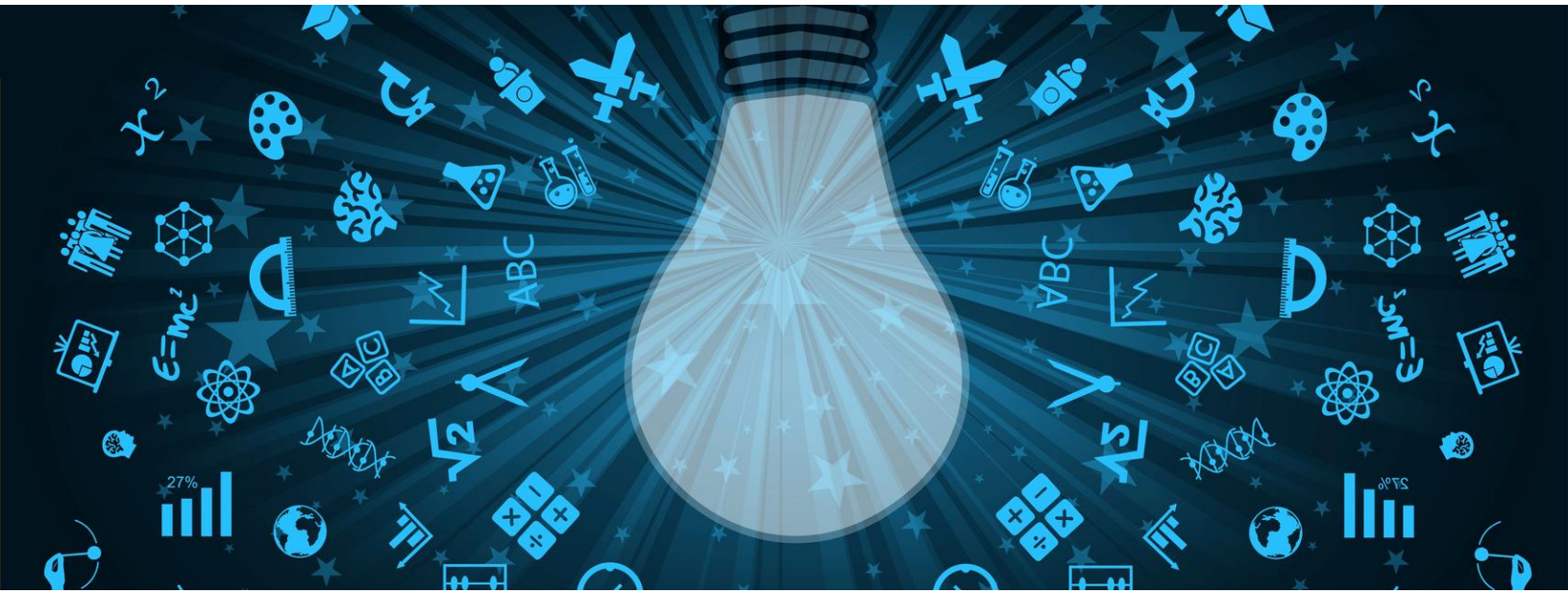
Social Responsibility

~Samruddhi Patil

Recent years have experienced dramatic climate changes. When the societal marketing phase started in the 80's, more weightage was put on environment friendly and sustainable products. However, this change has only seen a gradual positive turn until recently. When India signed the Paris Agreement, its goals included reduction of GHG emission intensity by 33- 35% below 2005 levels by 2030, its commitment to have 40% of the fuel be non-fossils and its promise to never let the per capita emissions exceed those of the developed world. ITC is the biggest Indian multinational company which practices carbon pricing. It has afforested more than 7 lakh acres of land and 41% of its energy consumption is from renewable sources. Fab India, Organics India have followed suit. Tata Motors, Mahindra and Maruti Suzuki have joined hands to develop an all-electric hybrid car. But, with so many firms entering the field and exploring carbon positivity,environmental friendliness and carbon pricing, the competition is bound to rise. However, this competition is advantageous. This is because as more and more people turn their attention to organic brands, the demand will give way to increase in supply and hence give an opportunity to the producers to explore more variety and let go of fossil fuels altogether, in the best way they can. After all, businesses that won't change with the storm of market trend of providing green products will lag behind. As for what is in for the society, people will sense that cost efficiency has tagged along with renewable energies, gas and water saving ideas. Increased efficiency, decreased cost and resource management will persist. As Antonio Guterres said, ***"India can become a global superpower in fighting climate change."***

Events of The Month

Our earnest students moved to the virtual world to pursue their competitive endeavours.



Recently we hosted the e-newspaper making competition. Contestants were at the peak of creativity as they used diverse media to design their very own newspaper.

We also held an essay writing competition which allowed us explore our creative sides and express our views on various topics.

One of the highlights of July was the sociology symposium, Metanoia. It served as a platform for deliberate discussions and dynamic debates among our budding orators.

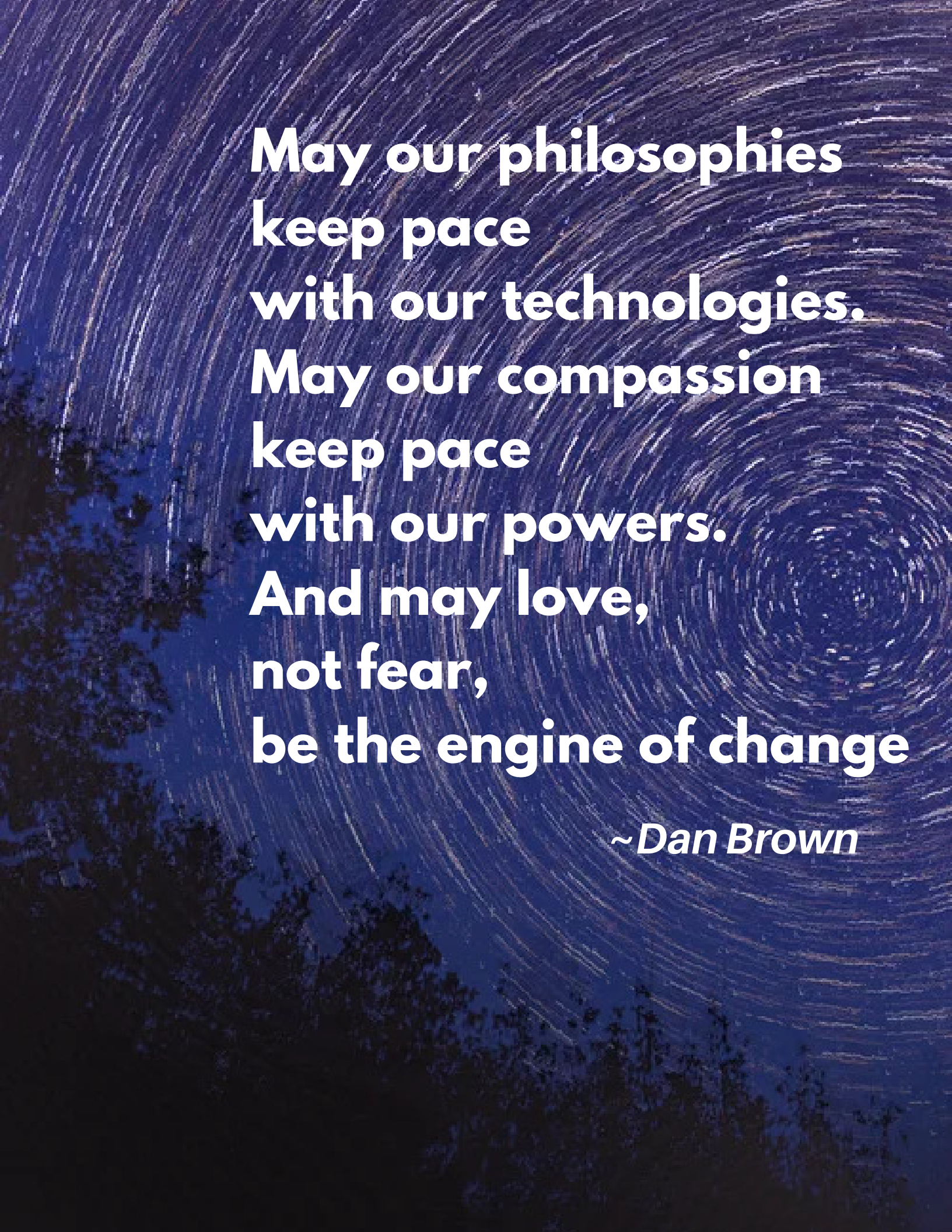
'Developing and Marketing a Product' : Students participated in groups of 2-5 and thoroughly enjoyed this new experience where they used their imagination and creative thinking to come up with innovative product ideas and out of the box ways to market them...

JAM means ' just a minute ' and is a true test of oratory, knowledge and presence of mind. Our participants expressed their unique perspectives on the ' out of the box ' topics with poise and ease just after a minute of deliberation.

Good Nights Sleep : was an exciting video making competition where our contestants made very interesting videos on the importance of sleep for teenagers.

'Sadhbhavna', the first ever online singing competition in the ISC section of Singhania School. Our talented participants who skillfully rendered melodious compositions expressing versatile emotions like joy and positivity, patriotism and extending mental support.

For all our budding scientists we also held a Chemistry Activity where students could expand their scientific horizons and discover different ideas in Chemistry


May our philosophies
keep pace
with our technologies.
May our compassion
keep pace
with our powers.
And may love,
not fear,
be the engine of change
~Dan Brown