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TATA POWER

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Preface

Electricity consumption has always been recognised as one of the key indicators of economic growth. So, if one looks at just electricity generation and consumption the picture looks good. India has done better than many of its neighbours. And power demand has surged annually, except for the post-COVID-19 period when energy consumption dropped.

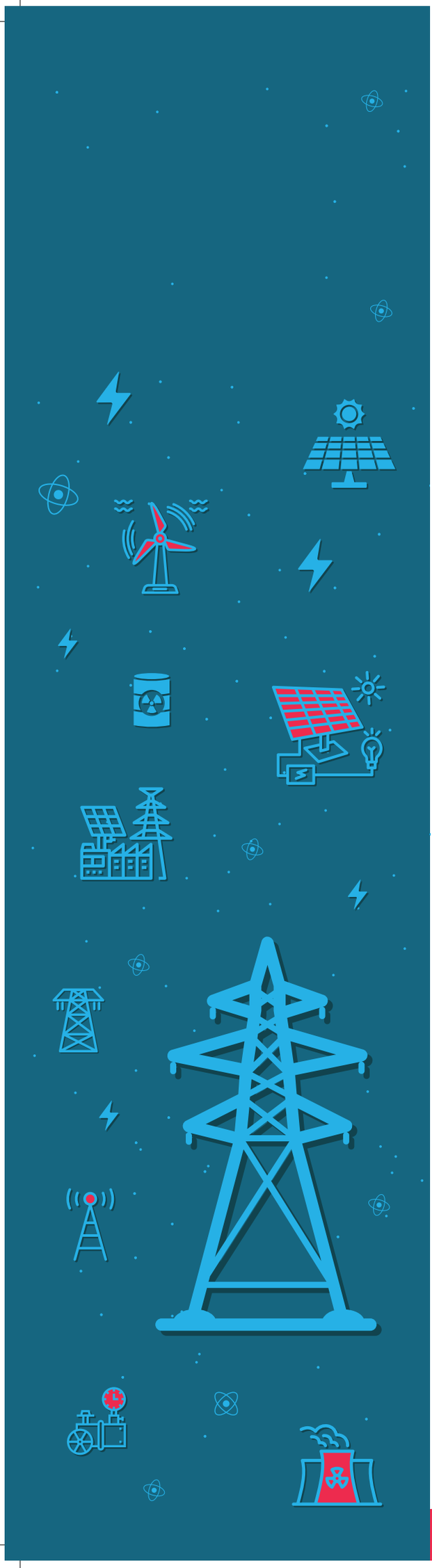
But the numbers conceal a malaise that almost every player in this industry is aware of.

First, in the name of benefiting the poor and the marginalised population of India, especially farmers, the power sector was allowed to abet theft of power and also inefficiency. Not surprisingly, much of the theft is by people close to politicians. Moreover, many politicians are farmers themselves and also run agro-based industries. Thus, they have always supported subsidised power and tax-free incomes for agriculture.

PER CAPITA ELECTRICITY CONSUMPTION

India		Select countries - 2014	
Year	Per-Capita kWh#	Country	Per-Capita kWh#
2005-06	631.4	USA	12,997
2006-07	671.9	Germany	7,035
2007-08	717.1	UK	5,130
2008-09	733.5	China	3,927
2009-10	778.6	Sri Lanka	531
2010-11	818.8	Bangladesh	320
2011-12	883.6	Pakistan	448
2012-13	914.4	Nepal	146
2013-14	957.0	Singapore	8,845
2014-15	1,010.0		
2015-16	1,075.0		
2016-17	1,122.0		
2017-18	1,149.0		
2018-19*	1,181.0		

Sources: CEA, Executive Summary on Power Sector, Jan 2020, for India; World Bank https://data.worldbank.org/indicator/EG.USE.ELEC.KH.PC for other countries
Notes: # = (Gross Gen.+ Net Import) / Mid-year population
* - Provisional



Further, the power distribution and transmission business were largely government-owned – except for some pockets where Tata Power, Adani and CESC manage such networks. Thus, when distribution networks could not pay for the power picked up from private power generators, who in turn could not pay for fuel, industrial sickness was just around the corner.

The system was crying for a change. But political myopia and self-interest did not want the status quo altered.

Then two things happened.

First solar power became cheaper than grid power. Second, solar and wind power (increasingly in conjunction with methane generation), allowed for more power to be generated off-the-grid. The popularity of rooftop solar in Tripura, a couple of years ago, allowed the demand for solar power to surge in a manner that politicians had never expected.

This revolution was aided by cheaper batteries and storage devices. That allowed villages to now have power without subsidies, without power cuts and, more importantly, without meddling linesmen peculiar to large grids. Without large power grids, and the grant of subsidies, the lure of illegal profits from the power sector (for unscrupulous politicians, bureaucrats and their industry friends) will now begin to wane.

That could give the power sector a big chance to transform itself into an extremely viable business.

Micro-grids will play a big role here. So, will renewable power. A bit more focus on rooftop solar — than large solar farms – will complete the picture. Yet, large solar farms do offer a real estate plot and land-grab opportunity.

One just hopes reform will prevail.

RN Bhaskar
Consulting editor

Second D OF DISRUPTION
Decarbonisation in form of renewable energy

Year	Non RES Generation (MU)	Generation from RES (MU)	Total Generation (MU)	Year-wise growth for renewable energy (%)	Contribution of renewables in total generation (in %)
2014-15	10,48,673	61,719	11,10,392	-	5.56
2015-16	11,07,822	65,781	11,73,603	6.58	5.61
2016-17	11,60,141	81,548	12,41,689	23.97	6.57
2017-18	12,06,306	1,01,839	13,08,145	24.88	7.78
2018-19	12,49,337	1,26,759	13,76,096	24.47	9.21

Source: CEA
Note: Renewable Energy Sources (RES) includes Wind, Small Hydro Project, Biomass Gasifier, Biomass Power, Urban & Industrial Waste Power & Solar Power.

SOURCE-WISE BREAKUP OF RENEWABLE INSTALLED CAPACITY

Source of energy	Wind	Solar	Small hydro	Biomass	Bagasse	Others
Cumulative generation (MU)	62,036	39, 268	8,702	2,763	13,562	425
Percentage (%)	48.94	30.98	6.87	2.18	10.7	0.34

Total Cumulative Generation (MU) → 1,26,759

Source: CEA
Note: Data is for the year 2018-19

The Future of Energy

Praveer Sinha,
CEO & MD
Tata Power

The power sector is undergoing the biggest disruption the world has ever seen. There are three Ds – Decentralisation, Decarbonisation and Digitalisation – they are governing the disruption in the power sector.

Decentralisation: The sector is moving from a large generation station to distributed energy generation. Due to decentralisation, power companies will not have to set up large power plants in remote locations to meet power demand. But facilities can be set up on a rooftop of a house or next to a house. There is a paradigm shift from centralised operations to distributed generation. It means the sector is empowering not just itself, but consumers too.

Decarbonisation: For a prolonged period of time, nature has not been cared for. The utilisation of coal-based plants to meet energy needs continued, even while they have toxic emissions – whether it is air or gas or solid emissions. There is now an opportunity where one can generate power through renewable sources like wind, solar, biomass etc. This also allows migration from the large generating units to small units.

Digitalisation: Today with the flow of energy, flows data. Unlike earlier times, today the data is available on a real-time basis. Now, digital technology is facilitating management of the network to make power more reliable, to ensure that requirement, generation, and load matches.

ENERGY DEMAND vs PEAK DEMAND

ENERGY					PEAK			
Requirement (MU)	Availability (MU)	Surplus(+) (MU)	Deficts(-) (%)	YEAR	Peak Demand (MU)	Peak Met (MU)	Surplus(+) (MU)	Deficts(-) (%)
8,61,591	7,88,355	-73,236	-9	2010-11	1,22,287	1,10,256	-12,031	-9.8
9,95,557	9,08,652	-86,905	-9	2012-13	1,35,453	1,23,294	-12,159	-9
10,68,923	10,30,785	-38,138	-4	2014-15	1,48,166	1,41,160	-7,006	-4.7
11,42,929	11,35,334	-7,595	-1	2016-17	1,59,542	1,56,934	-2,608	-1.6
12,74,595	12,67,526	-7,070	-1	2018-19	1,77,022	1,75,528	-1,494	-0.8
85,608	85,164	-445	-0.5	2020-21*	1,33,315	1,32,779	-536	-0.4

* Upto April 2020 (Provisional). Sources : CEA, Power ministry

INDIA'S PLF (Coal & Lignite based)

Year	PLF (%)	SECTOR-WISE PLF (%)		
		Central	State	Private
2010-11	75.1	85.1	66.7	80.7
2012-13	69.9	79.2	65.6	64.1
2014-15	64.46	73.96	59.83	60.58
2016-17	59.88	71.98	54.35	55.73
2018-19	61.07	72.64	57.81	55.24
2020-21#	42.4	49.86	33.48	44.28

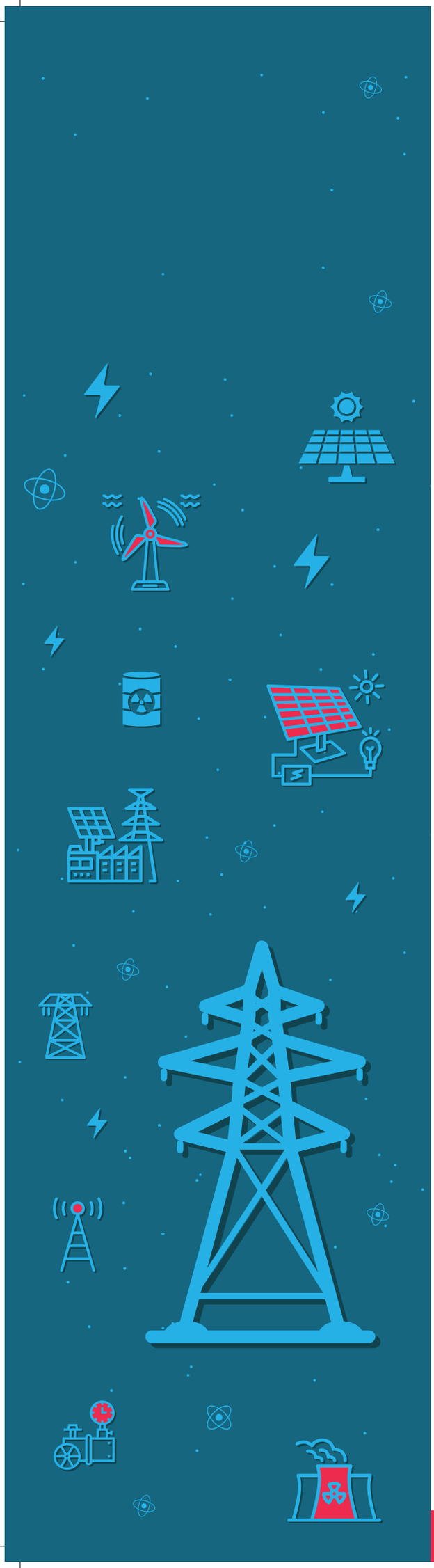
Upto April 2020 (Provisional). * Plant Load Factor (PLF). Sources : CEA, Power ministry

CHASING TARGETS

Source	Wind power	Solar power	Biomass & Gasification and Bagasse Waste-to-Power	Small hydropower
2022 target (MW)	60,000	1,00,000	10,000	5,000

Total 2022 Target (MW) → 1,75,000

Source: Power ministry



Peaking scenario

Statistics show that many of the plants are being utilised for a very limited time in the year (500-600 hours). This is not the case with base load plants but other plants which are used for peaking purposes. From the 8,760 hours in the year, 500-600 hours utilisation is just 5-6 per cent utilisation of these plants. To meet the peaking of power requirement which is 5-6 per cent, unique solutions like storage*, demand response and others should be utilised. To manage peaking of power, engagement with consumers will be useful.

Renewable challenge

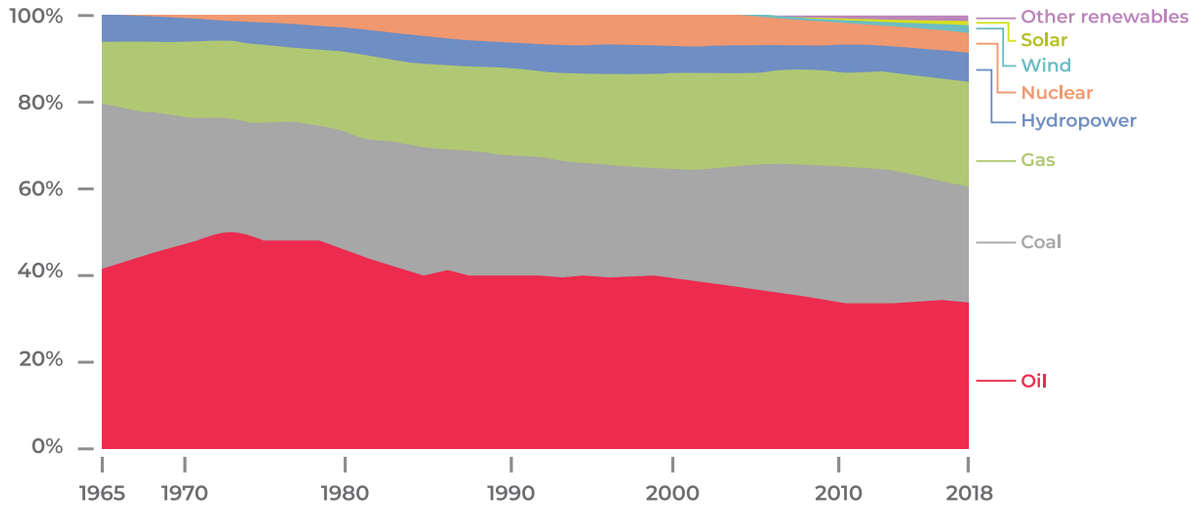
In terms of megawatts, Tata Power is generating 35 per cent energy from renewables. Meanwhile, the country's overall power generation in terms of megawatts is 25-27 per cent. In terms of real energy, it is not even 10 per cent as the effective generation is much less. However, in the country, Tata Power is setting targets of 175-450 gigawatts in renewable capacity by 2030.

By 2030, according to the Paris Accord, India will have 40 per cent of energy coming from non-carbon sources. However, the country will achieve a lot more than that.

By 2030, Tata Power plans to have 75 per cent of the energy coming from renewable sources. By 2050, Tata Power will generate 100 per cent from non-carbon.

*Youtube link: https://youtu.be/EoTVtB-cSps

ENERGY CONSUMPTION BY SOURCE



Source: Ourworldindata
Note: Energy consumption (in the World) is measured in terawatt-hours (TWh). Here an inefficiency factor has been applied for fossil fuels, meaning the shares by each energy source give a better approximation of final energy consumption.

GLOBAL ELECTRICITY GENERATION

Year	FOSSIL FUELS	NUCLEAR + RENEWABLES
	(% electricity production)	
1992	63.54	36.46
1994	63.05	36.95
1996	62.91	37.09
1998	63.99	36.01
2000	64.96	35.04
2002	65.82	34.18

Year	FOSSIL FUELS	NUCLEAR + RENEWABLES
	(% electricity production)	
2004	66.64	33.36
2006	67.25	32.75
2008	67.97	32.03
2010	67.64	32.36
2012	68.29	31.71
2014	67.03	32.97

Source: World Bank
Note: Global electricity generation measured as the percentage contribution from fossil fuels (coal, oil and gas)

GDP PER CAPITA (current US$) (in 2019)

Region / Country	United States	European Union	South Asia	Bangladesh	China	Pakistan	India
Most Recent Value	65,280.70	34,843.30	1,959.90	1,855.70	10,261.70	1,284.70	2,104.10

Source: World Bank

The Future of Solar Energy

Ashish Khanna,
President - Renewables
Tata Power

The energy mix (inclusive of oil and gas as well) is changing, the contribution of electricity will more than double from the current level of 19 per cent by 2050.

By 2050, this 19 per cent will be around 49-50 per cent. Out of 49-50 per cent (of electricity), 86 per cent will be renewables. Out of 86 per cent of renewables, 66 per cent will come from solar.

India's per capita consumption is not even one-tenth of the United States and one-sixth of Europe. By 2050, India will consume more power than Europe and the United States. By 2038 and 2050, India will overtake Europe and the US respectively. All these estimates could be achieved much sooner. Due to the COVID-19 pandemic, the adoption of technology and digitalisation will be quicker.

In the last three years, India added more than 100 gigawatts (GW) of solar capacity on a year-on-year basis. Compared to the last decade, today the prices of solar panels have become 94 per cent cheaper. Today, the same solar panel which was manufactured three years back costs half the price and produces twice the power.

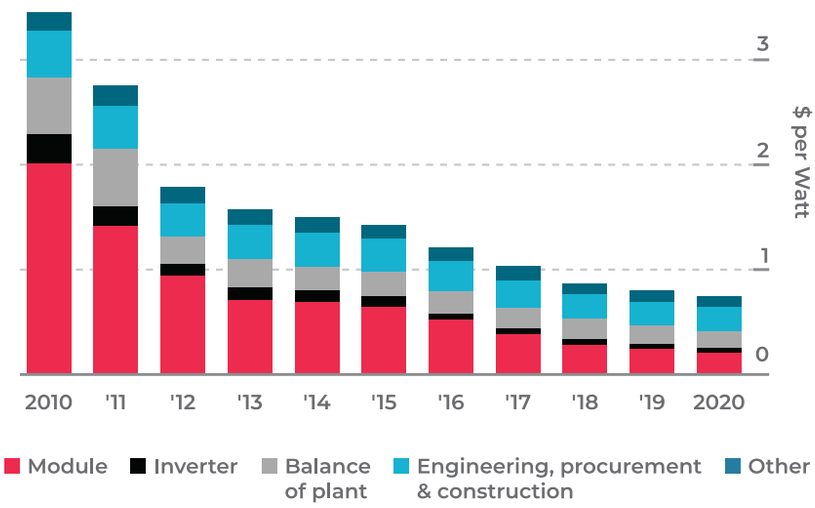
While prices of fossil fuels are dominated by appreciation and depreciation of the dollar, rents, geopolitical issues and other factors, there is solar energy which has advanced so much that costs have dropped.

In the residential segment, there is an option of on-grid and off-grid solutions. But in the industrial and commercial segment, solar has the potential to provide grid-connected power.

INDIA NEEDS TO REFOCUS ON SOLAR ROOFTOP

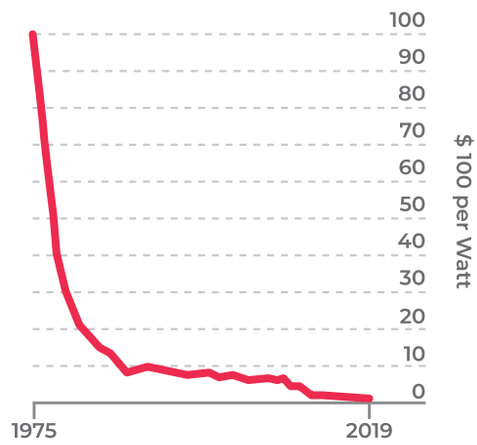
From $3.47 to $0.75

Utility-scle photovoltaic system cost by component and year



From $100 to $0.23

Crystalline silicon photovoltaic module cost per Watt



Sources: Bloomberg NEF; Bloomberg Green, Paul Maycock (Note Maycock data 1975-2003)

Notes: Solar prices have been falling. They could fall further.
India needs to reduce imports and improve the environment. Solar offers a great opportunity.
Rooftop solar, especially, is a huge employment generator, something that Germany discovered as long ago as in 2008. India has not woken up to this.
Solar rooftop reduces the need for annual subsidies, and even load shedding and power cuts, and Tripura discovered.
Rooftop solar connectivity costs one-fourth of grid connectivity costs.

OFF-GRID APPLICATIONS

6,59,218
Street Lighting

17,15,214
Home Light

58,23,800
Solar Lantern

2,37,120
Solar Pumps

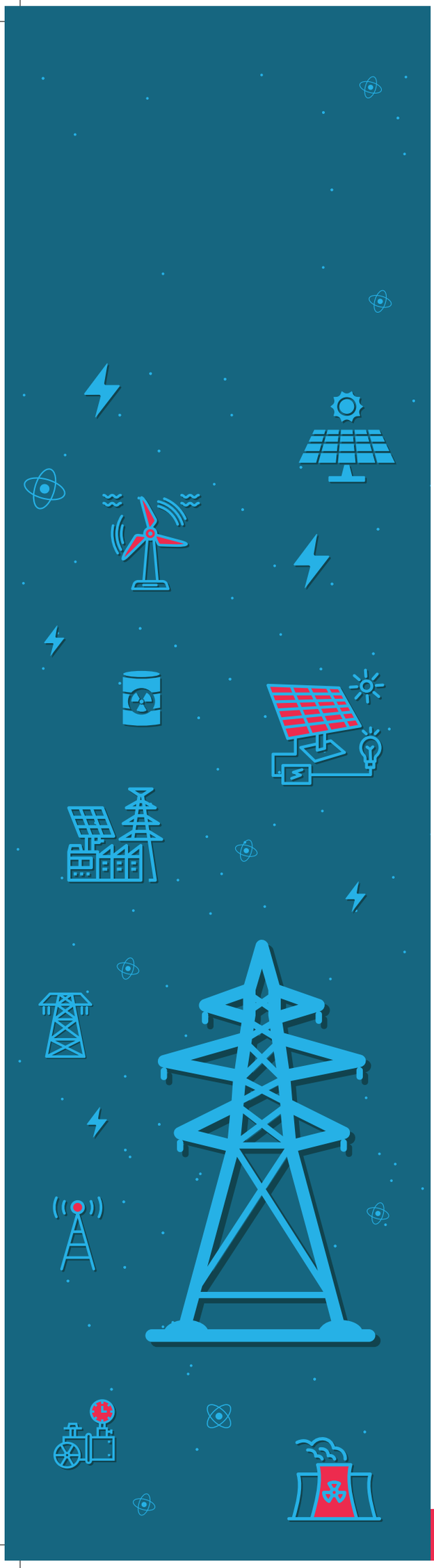
212
Stand Alone Power Plants (MWp)

Source: MNRE

GRID-CONNECTED SOLAR POWER

Year	CAPACITY ADDED during F.Y. (MW)	CUMULATIVE CAPACITY (MW)
Upto 2010	8.54	11.35
2010-11	24.58	35.93
2011-12	896.37	932.3
1012-13	752.16	1,684.46
2013-14	947.46	2,631.93
2014-15	1,112.07	3,743.97
2015-16	3,018.88	6,762.87
2016-17	5,525.98	12,288.85
2017-18	9,362.63	21,651.48
2018-19	6,529.20	28,180.68

Source: MNRE



Secure energy: Solar energy

A fixed cost for a 25-year period in the case of solar energy is an added advantage. After investing in solar, the consumer will have one thing less to worry about for many years.

For homes that are in isolated areas, rooftop solar will be beneficial as their roofs can generate power for them. This way the government will not have to spend a huge amount of money to establish a grid (in such remote locations) as power requirements grow.

While the consumption in the country is around 170 GW, India has a total capacity or the potential of 749 GW. The consumption of the country, which had dropped (during COVID-19-induced lockdown), has reached 158 GW of consumption that is pre-COVID-19 levels.

Solar energy can bring assurance among farmers

In the case of agriculture, it is heavily subsidised even though it is the backbone of our country. We subsidise power to a particular segment (read agriculture) while increasing the cost of power to another segment (read commercial entities). There is a need to have a one-time subsidy rather than having a subsidy every year.

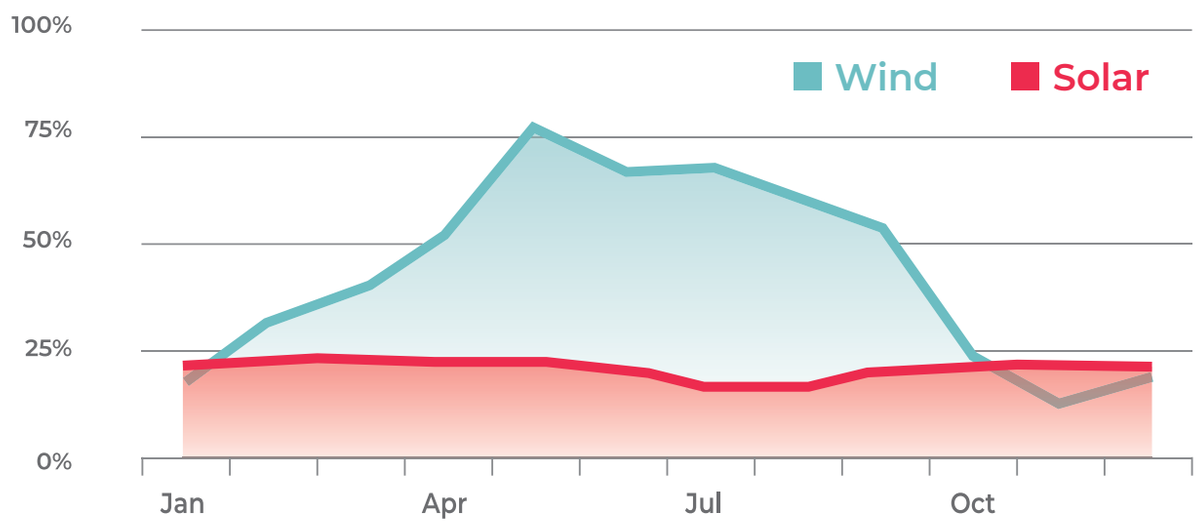
Another area in agriculture that needs attention is the need to provide security in terms of power supply to these farmers. There is a whole new technology that allows pumping of water which is based on your needs and on free power. Every farmer in the country just needs a 3 hp motor but they have installed a 10 hp motor pump in the villages as there is uncertainty around the availability of power -- is available for three hours or ten hours. These farmers flood their field even if they receive enough power as they fear a shortage of electricity supplies. Till the time, this fear is not eliminated from their mind, we will continue to see the water table go low, which we have witnessed in the last few years. The future and technology are there, we just need to implement it (solar-enabled systems will thus bring a level of certainty among these farmers).

INSTALLED WIND POWER CAPACITY AND GENERATION (in India)

Financial year	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Installed capacity (MW)	20,150	22,465	23,447	26,777	32,280	34,046	35,626	37,669
Generation (GWh)	-	-	28,214	28,604	46,011	52,666	62,036	64,485

Sources: Wikipedia, Mercom

SOLAR OUTPUT IS MORE PREDICTABLE THAN WIND OUTPUT



Source: Bloomberg NEF
Note: 1MW(DC) solar and 1MW wind modelled for a high resource site in Kutch, Gujarat.

INDIA'S LARGEST WIND POWER PRODUCTION FACILITIES (10MW AND GREATER)

Rank	Power plant	Producer	Location	State	MWe
1	Muppandal windfarm	Muppandal Wind	Kanyakumari	Tamil Nadu	1,500
2	Jaisalmer Wind Park	Suzlon Energy	Jaisalmer	Rajasthan	1,064
3	Brahmanvel windfarm	Parakh Agro Industries	Dhule	Maharashtra	528
4	Dhalgaon windfarm	Gadre Marine Exports	Sangli	Maharashtra	278
5	Vankusawade Wind Park	Suzlon Energy Ltd.	Satara District.	Maharashtra	259

Source: CEA

The Future of Wind Energy

JP Chalasani,
strategic advisor and former group CEO
Suzlon Group

Overview of wind energy

The Indian government has indicated an enormous amount of interest in the renewable sector. Today, the installed capacity of renewables in the country stands at 87 GWs. However, these figures about 10 years back would have been unimaginable.

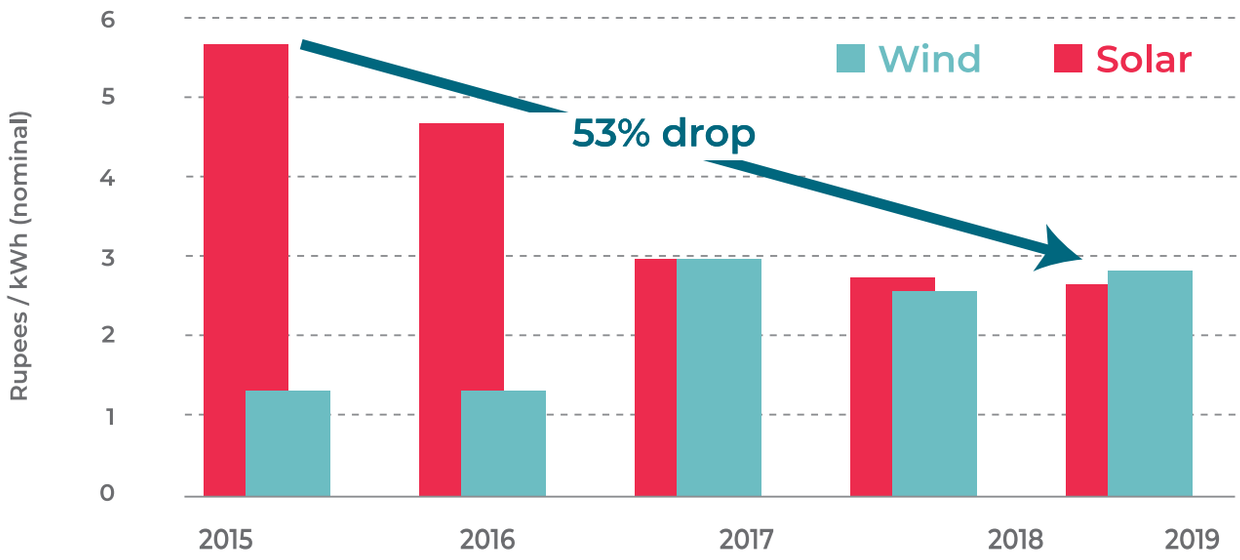
In the past, renewable energy was the fringe player, but today it is one of the main players. Today, the total capacity of renewable energy is at 20-25 per cent and it contributes around 10 per cent to the energy basket. However, the target set by the government is 175 GWs by the year 2022.

In the case of wind energy, it is 37 GWs which is 10 per cent of the total capacity. India is the world's fourth-largest country in terms of total wind installations. It is the second-largest in wind capacity in Asia.

While wind energy has been a leader all along, solar energy has been growing at a faster rate in the last few years. It is not wind versus solar but it is wind plus solar. I strongly believe that neither can solar energy survive without wind nor can wind survive without solar on a long-term basis. Both have to marry.

Of the 175 GWs target set for 2030 for renewable energy, it is estimated that 60 GWs is the target set for wind energy -- only 37 GWs has been achieved, 9 GWs is under implementation and 3 GWs is under the bidding process. The government is optimistic about reaching around 48 GWs (and not the 60 GWs as per the target set).

AVERAGE AUCTION TARIFFS FELL STEEPLY



Source: Bloomberg NEF
Note: Volume weighted average tariffs shown For solar, only utility-scale tariff based auctions are considered.

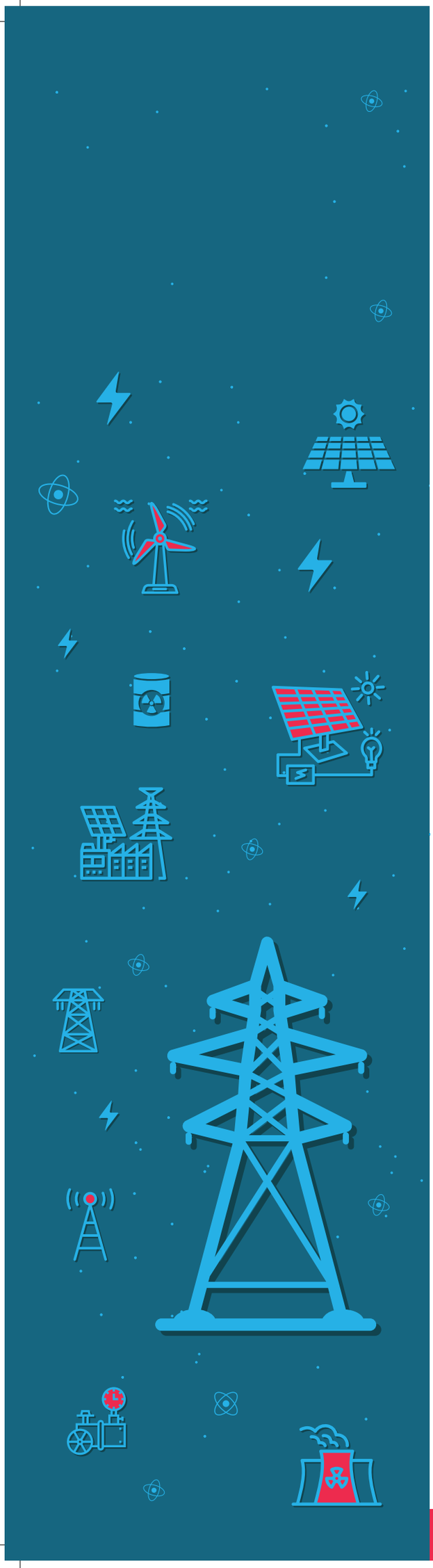
STATE-WISE POTENTIAL OF WIND ENERGY

State	Wind Potential (MW)	State	Wind Potential (MW)
Gujarat	84,431.33	Telangana	4,244.29
Rajasthan	18,770.49	Odisha	3,093.47
Maharashtra	45,394.34	Chhattisgarh	76.59
Tamil Nadu	33,799.65	West Bengal	2.08
Madhya Pradesh	10,483.88	Puducherry	152.83
Karnataka	55,857.36	Lakshadweep	7.67
Andhra Pradesh	44,228.60	Goa	0.84
Kerala	1,699.56	Andaman & Nicobar	8.43

Total in MW → 3,02,251.49

Total in GW → 302

Source: MNRE



Challenges and opportunities

The significant challenge is around capacity addition. It has subsequently slowed down in the last few years in the wind sector. In FY 2017, which was the last year of the feed-in tariff, we as a country added 5.5 GWs in one single year. However, three years put together — FY 2018, FY 2019 and FY 2020 — we have done less than that.

The shift from feed-in tariff to the bidding system was a challenge. There were challenges in terms of land acquisition or connectivity among other things. This is because the bidding process moved from the state level to the central level, where the only parameter for bidding is the tariff. So, every player wanted to set up a project where there is a highway. There was a huge demand seen in Gujarat. So, there was a rise in the price of land in certain areas, following which the government intervened and changed the rules which impacted the projects.

Most wind energy players are facing a challenge in making this transition of feed-in tariff to competitive bidding. The industry bids at low tariffs without evaluating if it is really sustainable or not. So, the country is plagued by the issue of low tariff in addition to other issues that are hurting the sector. This led to additional woes wherein states with a significantly high number of power purchase agreements (PPA) started looking at ways to wriggle out of the PPAs.

Another challenge the sector faced was integrating with the grid. As the renewable energy contributes about 10-11 per cent in the energy basket and is 23-24 per cent of the capacity, then you need t0 to be part of the grid discipline. Unlike conventional energy, renewable energy faces the challenge of maintaining that discipline. So, scheduling and forecasting is easy in the case of conventional energy, but not possible in the case of wind energy largely.

REACTORS IN INDIA

- Operating
- New sites

Source: World Nuclear Association

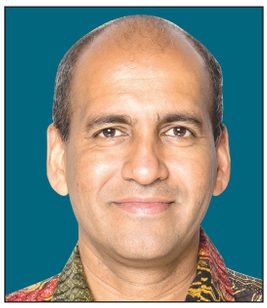
URANIUM RESOURCES (as of July 2017)

State	Districts	Main deposits	Tonnes U
Andhra Pradesh	Kadapa	Tummalapalle	1,20,229
	Guntur	Koppunuru	2,341
Telangana	Nalgonda	Lambapur, Pedagattu, Chitrial	15,731
Jharkhand	E.Singhbhum	Jaduguda, Bhatin, Narwapahar, Turamidh, Banduhurang, Mohuldih, Bagjata,	53,237
	Saraikela-Kharswan	Bangurdih	1,367
Meghalaya	West Khasi Hills	KPM (Domiasat), Wahkyn, Wahkut	19,538
Rajasthan	Sikar, Udaipur	Rohil, Umra	7,989
Karnataka	Yadgir, S.Kanara	Gogi	3,970
Chhattisgarh	Rajanandgaon, Surguja	Bodal, Jajawal	3,380
Uttar Pradesh	Sonbhadra	Naktu	666
Uttarakhand	Rudraprayag	Pokhri-Tunji	85
Himachal Pradesh	Una, Shimla, Mandi	Rajpura	665
Maharashtra	Gondia	Mogarra	301

Total → 2,29,499

Source: World Nuclear Association

The Future of Nuclear Energy



M V Ramana,
Director,
Liu Institute for Global Issues at the School of Public Policy and Global Affairs,
University of British Columbia:

Nuclear energy is the most controversial source of power. There are usually two narratives around nuclear energy — a bad source of energy or a good source of energy. It is rare to find a narrative that is neutral in the case of nuclear energy.

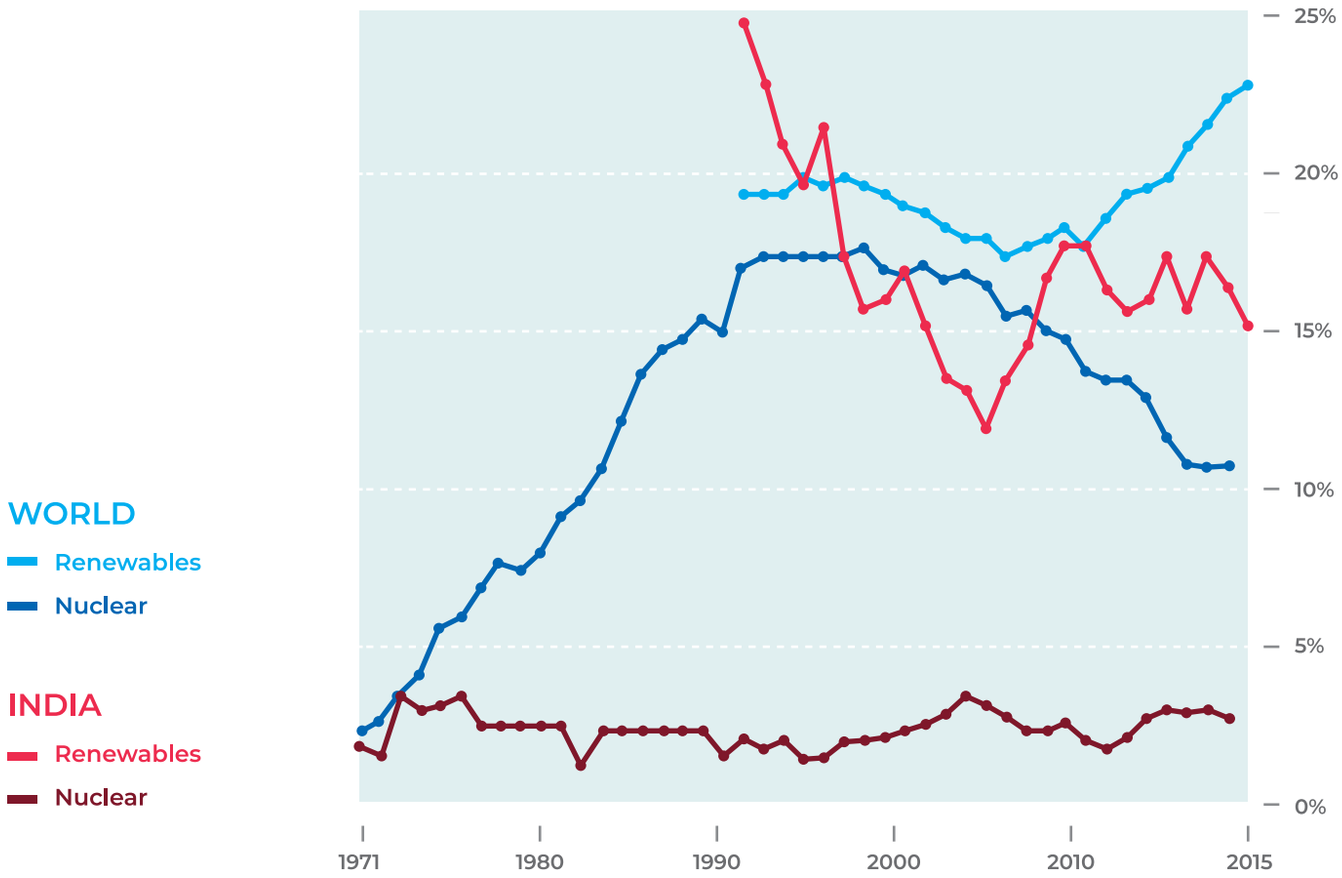
The primary argument around nuclear energy was the need to have this resource to provide electricity. But over the years, that argument lost ground as power generation from this energy was not very high yet the supplies of electricity continued. However, there is a new argument which states that countries need nuclear energy to generate electricity that does not emit carbons. This is to combat climate change. Both lines of argument become weak in the face of renewable energy.

Nuclear power plant

There are about 440 nuclear reactors which are spread across 31 countries. In the case of distribution, about five-six countries have a fairly large number of nuclear power plants. While India has about 22 nuclear power plants, countries like the United States and France have around 95 and 56 plants respectively. The United States has the maximum reactors. Then there were some countries who built two-three nuclear plants and stopped due to various incidents.

Most of these nuclear plants were built mainly in the 1970s and 1980s — the two big waves of construction. Since the 1986 Chernobyl accident, the rate of construction has fallen drastically. Since then the number of plants that are constructed is equal to a number of plants that are being shut down.

SHARE OF NUCLEAR & RENEWABLES



Sources: International Energy Agency (IEA) via The World Bank

Note: Percentage contribution by nuclear, and contribution of non-nuclear renewable sources to global electricity production. In this case, 'renewable electricity' includes hydropower, biomass, wind, solar, geothermal and marine production; it does not include nuclear.

NUCLEAR CONSUMPTION EXAJOULES IN INDIA

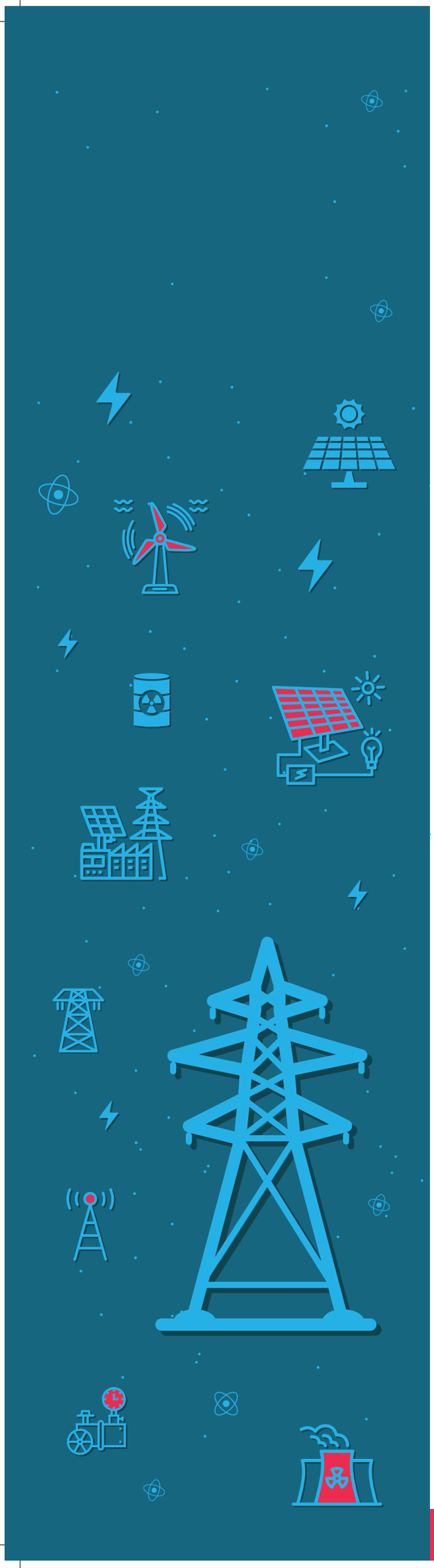
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
0.16	0.22	0.3	0.31	0.31	0.32	0.35	0.34	0.34	0.35	0.4

(input-equivalent) (in terawatt-hours)

Source: Wikipedia, BP

Notes: Based on gross generation and not accounting for cross-border electricity supply. 'Input-equivalent' energy is the amount of fuel that would be required by thermal power stations to generate the reported electricity output. †Less than 0.005.

Less than 0.05%. Nuclear data expressed in terawatt-hours is available at bp.com/statisticalreview.



For the last 20-25 years, the number of nuclear plants has more or less remained flat. The share of nuclear energy in electricity was 17. 5 per cent in 1996, which was the maximum. Since then its share has declined. Now, its share stands at 10 per cent.

According to various forecasts by the International Atomic Energy Agency (IAEA) and other agencies, nuclear power at best will maintain this market share or most likely it will decline further. It is not because nobody is building nuclear plants but other forms of energy are growing faster.

At the global level, the share of electricity from nuclear plants is 10 per cent, whereas in India the share of electricity generated by nuclear power has consistently remained between 2-4 per cent for the last 20-25 years. As per the latest figures, nuclear power contributed about 3.2 per cent of India's overall electricity needs.

Compared to nuclear energy, solar and wind energy have contributed much more in the last few years. Solar just overtook nuclear energy last year in terms of the electricity contributed to the grid. Wind energy had overtaken nuclear energy in 2012. Even though nuclear energy has been there since the 1940s, the newer technologies in solar and wind grew faster than nuclear energy.

Nuclear is the only source of energy whose contamination can spread out widely across space and time. For instance, in the Chernobyl accident, radioactive contaminants were found in every country of the Northern Hemisphere.

Due to this, large tracts of land are still uninhabited, especially in countries like Russia, Belarus, Ukraine among others. The Fukushima incident in Japan was yet another example of contamination. One of the unique properties of nuclear energy is radioactive waste material, which is generated from the use of this energy. These waste materials are hazardous to human health and can stay active for about 1,000 years. So, if countries want to produce nuclear energy, they will have to deal with the waste first and keep the waste material away from humans for an unspecified amount of time.

Recommendations

- India needs to take a hard re-look at its electricity network. There is a case for national grid networks servicing only key urban centres, and industries which require high tension power.
- The rest of the country could be serviced through microgrids, which result in import savings, job creation, the removal of a subsidy regime, and the creation of a more environmentally-friendly energy sector.
- As this publishing group has pointed out quite often, the employment potential of rooftop solar alone is at least 80 million jobs within a few years' time, To achieve this, the following steps need to be taken urgently:
- India needs to have a robust policy for microgrids. This microgrid policy must be integrated with policies of other related areas like solar and renewable energy policies. There is a huge potential to help rural electrification through microgrid intervention.
- This policy should support good public-private partnerships (PPP). It should allow entrepreneurs to provide 24 x 7 reliable and affordable electricity to people.
- It should include direct benefit transfers (DBT) of any targeted subsidies for end-consumers connected to either the utility grid or to microgrids. The DBT amount could be met through variable pricing of power by the microgrids themselves. Cheaper solar power will ensure that eventually power tariffs will not go up.
- Given India's village count of over 6 lakh, even a cluster of around 10 villages will be good enough for a microgrid network. That would mean as many as 60,000 clusters.
- The government could offer them to potential investors through an open tender basis.

- The core financing for such networks could easily come from capitalising electricity subsidies for 10 years. These are the subsidies that governments (both states and the centre) have constantly earmarked for losses, theft, or genuine supply of subsidised power. The capitalised subsidies could be transferred to a microgrids SPV (special purpose vehicle) which could float bonds carrying a sovereign guarantee and attractive coupon rates. That money could be given to banks to finance selected entrepreneurs for setting up such microgrid networks.

- With microgrids being set up, further subsidies to the grid network will no longer be required. That will allow for power tariffs — for industry, commercial establishments and even city consumers – to fall. That will make the industry a lot more competitive. It would accelerate the prime minister's vision of an Atma Nirbhar Bharat. Such microgrid networks will act as catalysts for collaboration between government and the private sector to build clean, resilient and stable grids in remote markets.

- This will lead to decentralisation of power generation and distribution. Since the distance between power generation centres (solar, wind or any other) to consuming centres will be short, there will be little or no transmission loss. It will also create local jobs, and entrepreneurship opportunities.

- Such decentralisation is the quickest and most efficient way to improve the per capita electricity consumption (see Preface) and reliable services by moving away from large grid-based systems to localised generation, transmission and distribution.

More faith in the sun

Right at the time of registration for the webinar series 'The Future of Energy', NMIMS-FPJ asked each member of the audience to respond to a survey. When the data was compiled, it was found that around 64 per cent of the audience (comprising over 2,000 persons) felt that solar energy will be the fastest-growing segment in the energy sector. Clearly, the audience was also reflecting the view held by most energy professionals.

Meanwhile, around 11 per cent felt that after solar, biomass (waste to methane) energy will be the fastest-growing. This will be followed by nuclear energy (10 per cent), hydroelectric (8 per cent), thermal (4 per cent) and wind (3 per cent).

Usually solar and wind energy are mentioned in the same breath. However, the survey showed that only 3 per cent believed that wind will grow as fast as solar. The survey pointed out that more people have faith in coal-based thermal energy's growth rather than in wind energy.

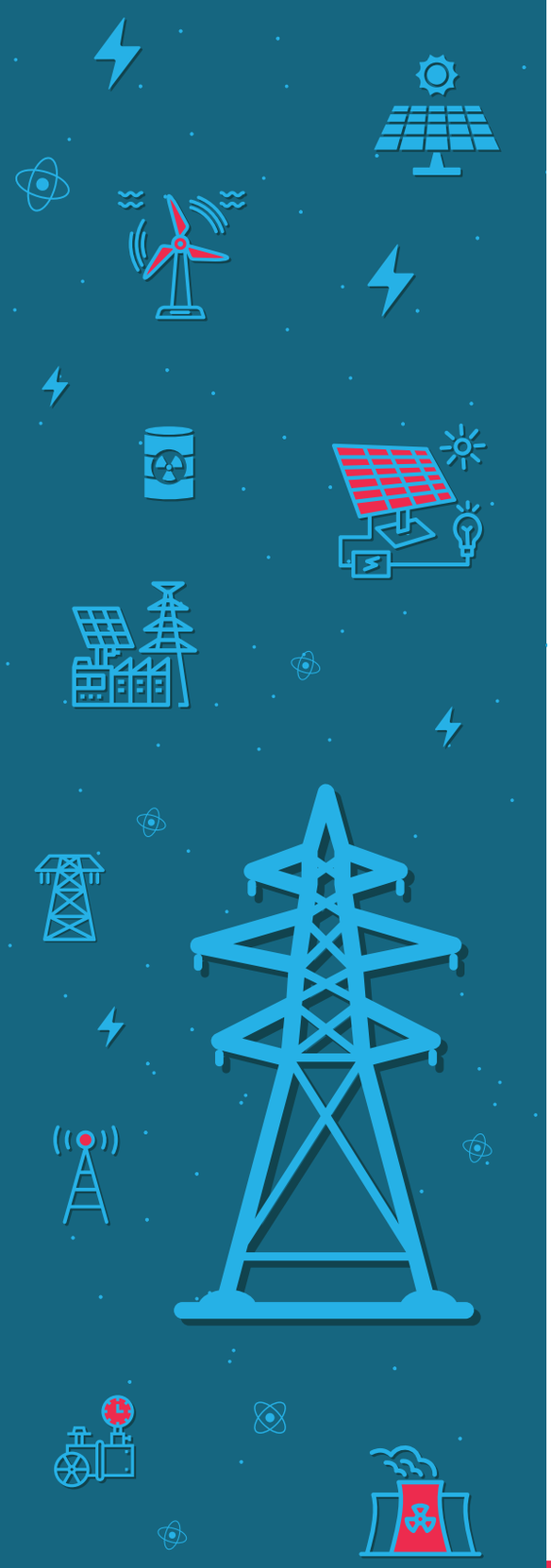
The survey also tried to understand the respondents' view in the case of hurdles that would come in the way of the growth of various forms of energy.

In the case of nuclear energy, more than 90 per cent of respondents felt that its generation capacity in India will go up in the next decade. Meanwhile, the survey showed that around 74 per cent of respondents felt that safety issues (related to radioactivity) are extremely worrisome, where nuclear energy is concerned. Meanwhile, about 14 per cent felt that cost is of concern.

Almost 26 per cent of the audience believed that bad government policies hindered investment flows into the energy sector in India. Add to that another 7 per cent which believed that failure to respect and honour contracts was the reason for poor investment appetite. Thus, collectively, 33 per cent of the audience believed that the government had failed to create the right atmosphere for promoting investment in the energy sector.

About 21 respondents felt that the lack of technology in the energy sector is putting off investors from investing in the energy sector in the country. Yet another challenge is inadequacy in the capital which 18 per cent respondents stated.

References and Responses



Youtube Live session:

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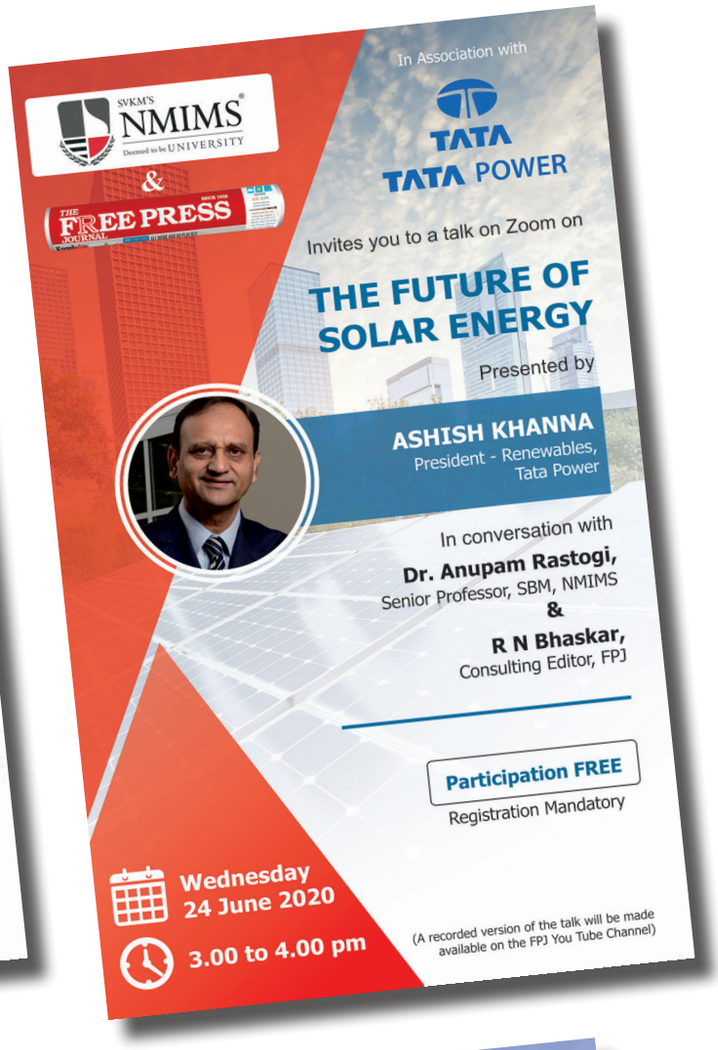
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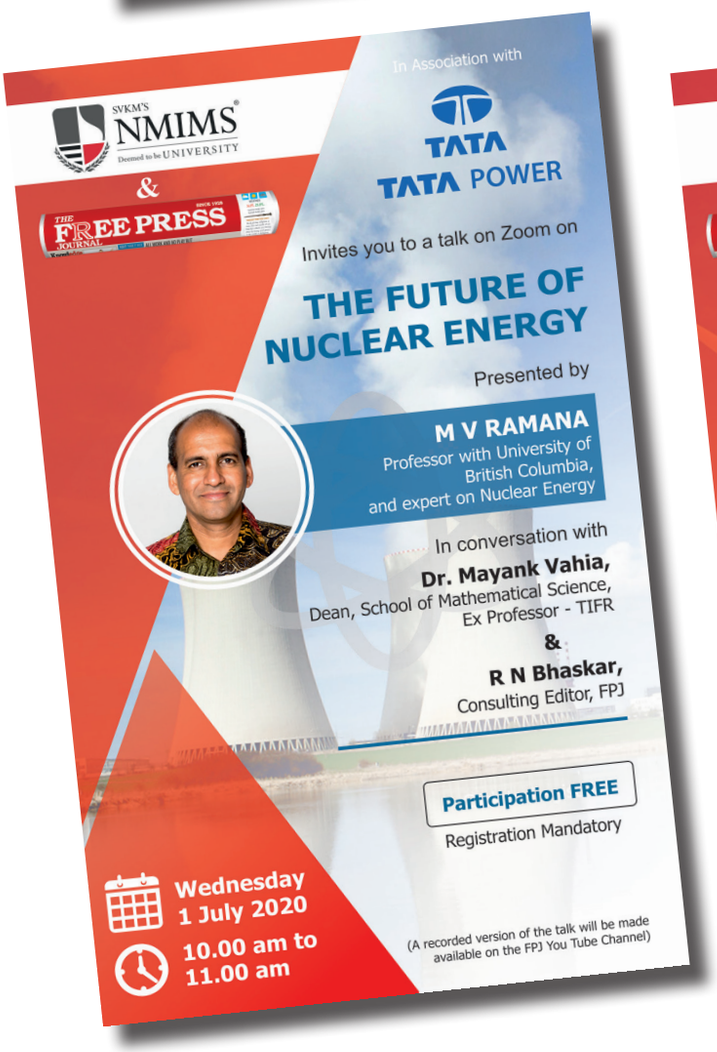
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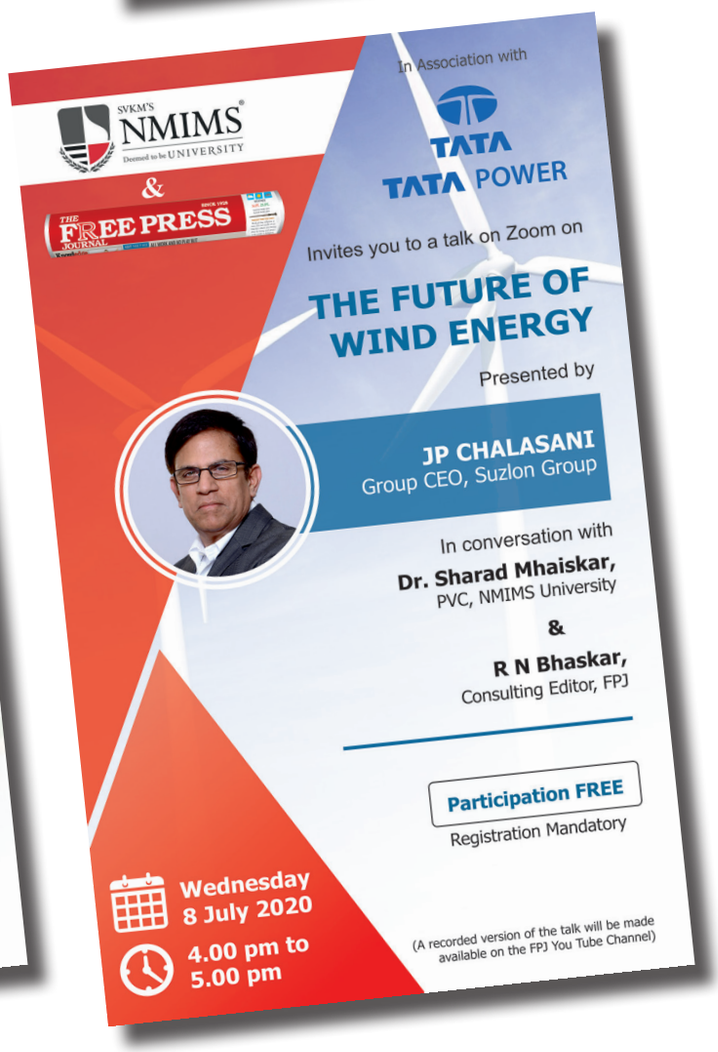
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&
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Participation FREE
Registration Mandatory
Wednesday
8 July 2020
4.00 pm to 5.00 pm
(A recorded version of the talk will be made available on the FPJ You Tube Channel)

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