

# “मुमकिन है... It's Possible”

Intelligent, Transformational and Sustainable Energy



# “It’s Possible”

Clean, Reliable and Affordable Energy



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A



# About Integrated Report 2018-19



## Purpose

This is Greenko's second consecutive Integrated report, drawn up to provide the reader with a comprehensive view of Greenko's performance in creating long term value for stakeholders through operational, financial, environmental, social, intellectual and governance efforts. This report is prepared through structured process involving internal reflection to map value creation factors and to assess the adequacy of strategy to protect and to enhance value creation in the face of disruptions. Further, Greenko seeks to transform into a utility of the future by deploying digitalization and decentralization measures and make the clean, reliable and affordable power in India, a possibility. This report details Greenko's efforts in the transformation to Greenko 3.0 and 4.0.



## Content Orientation

This report is an account of how Greenko's strategic initiatives are effective in protecting and enhancing both financial and non-financial value creation, retention and distribution. In the subsequent sections, (i) snapshot of Greenko's assets and operations is presented in the context of its decade-old journey (ii) the framework of trust that is essential for stakeholders to co-operate and co-create

value (iii) how value creation ability of Greenko is protected and enhanced in the face of external developments that are disrupting the energy sector businesses and (iv) the performance of Greenko in creating and sharing value.

This report is intended to communicate our effective transition to GKO 3.0 and 4.0 in the face of evolving contours of regulations, technology and ecosystems. The report details Greenko's continuing pursuit of Integrated Renewable Energy Storage Projects and digitalization across operations including building an Integrated Energy Platform. To reinforce agility, Greenko has set in motion People, Process and Systems across all operations and implemented "ownership model" of organization development. These organizational initiatives to build the future energy utility of India are outlined in this report.



## Information Boundary

The information and data in the report correspond to the progress made during the period 01st April 2018 to 31st March 2019 and refer to all the entities within the Greenko Group.

The report contents also mention figures and events from the past to offer perspective. The forward-looking statement contained in this report is based on the analysis of the current context and its expected outcome is susceptible to change. Care is taken to ensure that all data in this report is as accurate as possible.



## Guidelines and Standards

This report has been prepared in line with the framework established by the International Integrated Reporting Council (IIRC). This report also refers to GRI Standards for reporting and captures Greenko's contribution towards achieving the objectives of UNSDGs.

For any queries and suggestions on the data and information please write to [sustainability@greenkogroup.com](mailto:sustainability@greenkogroup.com)

GRI 102-46, 48, 49, 50, 51, 52, 53, 54



## Connectivity

The content of this report is complemented by other corporate documents and by information on the group's website. In specific cases, reference to such information is mentioned.





B



# Leadership Speaks

# Message from the Chairman



“  
Greenko is widely respected for its adherence to values and its pursuit towards building a responsible and sustainable business model.  
”

**Om Prakash Bhatt**  
Chairman





“

**Greenko, Powering India with a vision of Decarbonized, Digitalized and Decentralized energy assets and re-defining the sector.**”

#### Dear Stakeholders,

It is my great pleasure to present to you, the performance of Greenko contributing to financial and non-financial value creation for its entire stakeholder community.

Greenko is widely respected for its adherence to values and its pursuit towards building a responsible and sustainable business model focused on the empowerment of people, preservation of the environment and inclusive economic development. Further, Greenko would advance and extend this business philosophy - “To lead Decarbonization, Digitalization and Decentralization of India’s Energy Sector”. Greenko believes that the pursuit of its vision would make it possible to provide, clean,

reliable and affordable power, which will drive prosperity for people and the planet.

In India, the energy sector is stressed with high cost of coal and gas-based power generation, decelerated electricity demand growth, difficulties of early and exuberant business models of RE and the well-known challenge of weak financial position of state-owned distribution utilities. It is a testimony for Greenko and the wise moves of its leadership that it is not in the trap that has gripped several players of the sector. Over the last few years, Greenko while continuing to operate its existing assets efficiently and effectively is preparing tirelessly for a transition to Greenko 3.0 to generate schedulable electricity at utility-scale to power economic growth in India.

Greenko believes that adherence to Values SEED-IT, has been and will continue to be the foundation on which Greenko edifice has been and will be built. This unwavering commitment to values, in the face of disruptions in the environment and successful transitions in the business model is the reason for the continued stakeholders trust in Greenko. We are fortunate to also have the support of GIC, our main shareholder, who views ESG (Environmental, Social, and Governance) factors as central to its core tenets as a long-term investor. GIC believes that companies with good sustainability practices are likely to perform well financially in the long term.

According to the strategy established for the transition to Greenko 3.0 and in line with our actions in recent years, Greenko is going to undertake a major investment plan

with a focus on Integrated renewable energy projects combined with intelligent energy platforms to provide innovative real-time solutions for the significant growth of our customers. The regulations are in transit and the favourable ecosystem are still evolving to support the IoT movement, but Greenko being a leader in the industry is actively engaging with all stakeholders, participating in advocacy to boost the movement further. We are encouraged to find that regulators and policymakers appreciate our solutions to address the challenges that provide clean, reliable and affordable energy to power sustainable growth of India.

During FY2018-19, we have added new expertise to the Board, made it more diverse and continued with the vigorous application of whistleblower policy and code of conduct. The board committees, audit, remuneration and others, have been very active and guided the management in facing the new challenges during business transformation. The board has ensured that the management plans for transitioning to Greenko 3.0 are robust, practical and will deliver shareholder value. The risks are diligently identified and mitigated to a large extent and the provisions are made for residual ones.

In this report, we have outlined our value creation process and how it is transforming to harness new value pools to deliver clean, reliable and affordable energy to power sustainable growth of India. We will be keen to listen to our stakeholders - concerns and suggestions.

**Om Prakash Bhatt**  
Chairman

## Message from the CEO & MD



“ At Greenko, we are passing through an exciting phase. We believe that we are rightly placed to harness the opportunities created by energy transformation-decarbonization, digitalization and decentralization. ”

Anil Kumar Chalamalasetty  
Chief Executive & Managing Director

# #MoreSmilesPerWatt



## Dear Stakeholders,

I am delighted to share with you, Greenko's second Integrated Report adhering to the International Integrated Reporting Council (IIRC) requirements. This report is an endeavor to bring to you Greenko's performance on financial and non-financial aspects during the reporting period of FY2018-19. We believe that our report would provide adequate information to assess value creation by Greenko and its sustainability.

At Greenko, we focus on continuous value addition to all our stakeholders. We want to deliver **#MoreSmilesPerWatt**. This is possible through good governance practices, a culture of innovation, and strong organizational capabilities built around the ownership model.

The energy sector globally and particularly in India is going through a turbulent phase and this disruption is likely to be prolonged. Further, **#Decarbonization, #Digitalization and #Decentralization** will continue to challenge the policy paradigms and old business models. At the end of the reporting period, as many as 34 power companies have accumulated Rs. 1.4 lakh crore of NPA for Indian banks out of total bad loan amount of Rs. 2.24 lakh crore. Many of the coal-based power generation companies, that too most efficient supercritical thermal power plants are facing challenges. Further, many of the old business models of Renewable Energy Generation have not been able to withstand the consequences of technological advances and the

unhealthy financial position of the state-owned power purchasers. On the other hand, adoption of better technologies and digitalization has led to decrease in cost of renewable energy generation, enabling efficient management of remote assets and intelligent handling of energy's demand and supply, advancing the feasibility of clean, reliable and affordable electricity generation. This **#NewEnergyNewIndia** will not only be plentiful, but it is also affordable and easily available at the customer's call- thus bringing **#MoreSmilesPerWatt**.

It is a paradoxical situation. The technological and economic changes offer a resolution to decade-old energy puzzle in India - Is clean, reliable and affordable electricity possible? And when such a solution has become a possibility, many businesses in the sector are facing challenges in exiting the old ways of doing business. In this context, seizing this moment and providing clean, reliable and affordable power, is not just a business opportunity for Greenko but it is a part of our legacy and social responsibility.

At Greenko, we are passing through an exciting phase. We believe that we are rightly placed to harness the opportunities created by energy transformation- decarbonization, digitalization and decentralization. Our pre-eminent position- **"To lead Decarbonization, Digitalization and Decentralization of India's Energy Sector"** is not accidental, but well envisioned. From the day, when we began our energization and de-

carbonization journey in 2006, we were preparing for this **#EnergyFuture**. Being in the right place and at the right time is not enough. We have to make the right moves- swiftly and diligently guided by Greenko values.

Our financial performance during the reporting period FY2018-19 is exemplary and characterized by revenue, growth of 54.3%. This is despite the continuing challenges in the power sector in India primarily due to sluggish economic growth. Investors continue to trust our value creation model and our ability to sustain it. This is particularly exemplified by the oversubscription of our green bond offers. We are sanguine that investors are keen to participate in the **#NewEnergyNewIndia** story.

We continue our focus on high capital productivity and accordingly for investments into operation and maintenance through intense deployment of digitalization, which has been an important element of our strategy. We have been allocating a significant proportion of our financial resources to Capex diversifying in such a way that not more than 40% of Capex is allocated to one SBU. Going further, we anticipate significant investment focus on Integrated Renewable Energy Projects and Intelligent Energy Platform. During the reporting period, we have been able to achieve healthy PLFs of 42.6%, 24.7% and 24.0% in our Hydro, Solar and Wind SBUs' power generations respectively. We also have been able to limit operational losses in Hydro, Solar and Wind SBUs at 0.40%, 0.35% and 1.7% respectively. This reporting

# Message from the CEO & MD

period, we sold 30% of our power in the B2B segment and this demonstrates our ability to access the energy customers directly, which will be the salient feature of **#NewEnergyNewIndia**. We will continue to strengthen this position and reinforce it to reach schedulable renewable power through storage and intelligent energy platform.

At Greenko, we have adopted the ownership model in place of the accountability model. Each of our employees takes ownership of the task and their business contribution has a sense of purpose beyond the call of duty and become our brand ambassador. This initiative is augmented further with PPS (People, Process and System). We are proud that these organizational transformations are well embraced by the organization and setting in motion transition to Greenko 3.0 & 4.0.

Our per capita training hours of 27.1 and retention rate of 93%, we believe is good and we can maintain or enhance the same. Besides, we need to provide alternate means and modes of training and learning to all our employees including those employed with contractors. This is very essential given our renewed focus on digitalization and decentralization initiatives. The number of hours devoted to the safety training of employees and contract workers has significantly increased over the previous year, while the number of hours devoted to safety training of contract workers alone was increased by 91%. We continue to achieve zero fatalities in this reporting period. Our

turnover in the age group of less than 30 years is high and more so amongst women and we will address this challenge.

We owe our success to our external stakeholders including suppliers and customers. More than 95 % of our suppliers have been working with us for more than three years. We note with satisfaction that our suppliers and customers are happy with us as indicated by the respective satisfaction indices 95% and 92%. As we transition to Greenko 3.0, the nature of our suppliers and relationship with them will significantly transform. Our teams have already made necessary preparations in supply chain management systems.

Our community outreach through our involvement in community development initiatives has grown by five times, over the previous reporting period, in terms of the number of beneficiaries. Such an increase has become possible by strategically targeting and effectively investing. In the near future, we would sharpen our impact through community social investment by measuring social return on investment.

Besides contributing to de-carbonization of energy in India, we contribute to improve the environment through many conservation efforts. These extend from preserving native vegetation at our project sites to improving habitats for birds at our sites and conserving threatened species including Olive Ridley Turtles away from our sites.

As Greenko continues to create and enhance value through strategic moves, the success of this journey is contingent upon partnerships and engagement with stakeholders. Stakeholder suggestions and feedback on our endeavor to build a sustainable business is welcome and will be acted upon.

**Anil Kumar Chalamalasetty**

Chief Executive & Managing Director



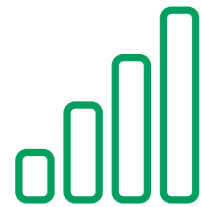


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# FY 2018-19 Performance Snapshots

# Performance Highlights



## Financial Capital



Amongst the

# Top 3

RE companies in India by revenue generation

# 54.30%

Of revenue growth in FY2018-19 over FY2017-18

# A+

Financial rating



## Natural Capital



# 5.9 Mn

tCO<sub>2</sub> avoided

More than

# 110,000

trees planted

# Biodiversity

- Disentangling of Olive Ridley Turtles
- Conservation of Great Indian Bustard



## Human Capital



# Zero

Fatalities

# 93%

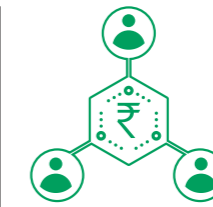
Overall retention rate

# 27.1

Training hours per capita

# 67,551

Training hours



## Social & Relationship Capital



# 257,895

Persons benefited from Community Initiatives/ interventions

# 95%

Suppliers retained beyond three years

# 475

Community members' skill upgraded

# 5 RO

Water plants installed



# Performance Highlights



## Intellectual Capital



**100%**

Real-time monitoring of assets

**40%**

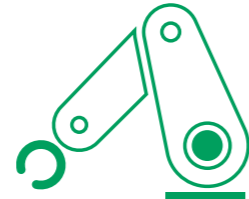
Sites are Integrated Management System certified

**90%**

Sites are People Process & Systems audited

**10**

Rewards & recognition programs conducted



## Operational Capital



**1.5 GW**

Of total capacity added

**7,174.8**

Generation (GWh)

<b>Plant Load Factor</b>	▶
<b>Machine Availability</b>	▶
<b>Grid availability</b>	▶

### Hydro

**42.6%**

**99.6%**

**97.9%**

### Solar

**24.7%**

**99.65%**

**99.41%**

### Wind

**24.0%**

**98.30%**

**98.6%**

# Contribution to UNSDGs

Greenko makes a significant positive contribution to eight of the United Nation’s Sustainable Development Goals, through our business activities. The progress towards contributing to these 8 goals have been incorporated in the different sections of this report.



Ensure access to affordable, reliable, sustainable and modern energy for all.

### Contribution

Reached **4.8 GW** installed capacity | No. of households powered **2.3 Mn**



Take urgent action to combat climate change and its impacts.

### Contribution

GHG Emissions avoided **5.9 Mn tCO<sub>2</sub>**



End poverty in all its forms everywhere.

### Contribution

Livelihood opportunities generated through business activities **10,000** persons benefited | Livelihood opportunities generated through community development interventions **475** persons benefited



Ensure healthy lives and promote well-being for all at all ages.

### Contribution

**Zero** fatalities | Beneficiaries of community health improvement interventions **16,936**



Ensure availability and sustainable management of water and sanitation for all.

### Contribution

Number of beneficiaries **18,452** for drinking water projects and sanitation projects amongst community



Ensure sustainable consumption and production patterns.

### Contribution

Reduction in **Material, Water & Energy** consumption



Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

### Contribution

**150,000 nos** Fish seedings done | Project **Disentangling Sea Turtles** in progress with WWF



Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

### Contribution

Number of trees planted - More than **110,000** | Landmass area **prevented** against degradation | Terrestrial ecosystems area **protected**

# Awards and Recognitions

As we continue our growth trajectory, our performance across our value chain has been recognised with the following awards during the year under review:

## Driving Sustainability



### Animala and Zuan received "Green Company Gold Rating"

**Animala Wind Power Pvt Ltd** and **Zuvan Energy Pvt Ltd** of Ghani Solar Park, Kurnool have received Green Company Gold Rating from CII-Godrej GBC at a specially organized Awards Ceremony during the Green Power Conference & Exposition on Renewable Energy 2018 at ITC, Grand Chola, Chennai.

With this award, Greenko has become the first Renewable Energy Company to receive a Green Company rating. This ensures that we keep up the good work across all Greenko Operating Plants and Projects and strive to continually improve our Green practices and initiatives.



### CBIP Award

Greenko was presented with the Central Board of Irrigation & Power (CBIP) Award for Outstanding contribution for development in the Renewable Energy sector by Shri Raj Kumar Singh, Honourable Minister of State for Power & New & Renewable Energy. The award was collected by Mr. Vasudeva Rao Kaipa, Chief Financial Officer, Greenko.



### Divyesh Power Winner of Golden Peacock Eco-Innovation Award

**Divyesh Power Private Limited**, of Ghani Solar Park, Kurnool has been awarded as the Winner of 'Golden Peacock Eco-Innovation Award' by IOD (Institute of Directors) for MOCE- Module Cleaning Efficiency- a method to optimize water usage by identifying the right time to clean the modules & effectiveness of cleaning, for the year 2019 by the Awards Jury under the Chairmanship of Justice (Dr.) Arijit Pasayat, former Judge, Supreme Court of India.

# Awards and Recognitions



## "CII SR EHS Excellence Awards"

Greenko Rayala Wind Power Pvt Ltd.' has been awarded "3STAR RATING" in recognition of the best EHS practices during the CII SR EHS Excellence Awards for the year 2018.



## "Best Safety Management Awards"

Greenko Rayala Wind Power Pvt Ltd., has been awarded "BEST SAFETY MANAGEMENT AWARD" in recognition to best EHS practices. The award was presented on the occasion of 48th National Safety Week Campaign - "Cultivate & Sustain Safety Culture for Building Nation" organized by National Safety Council of Andhra Pradesh in association with Department of Inspector of Factories at Anantapur AP State.



## "Sanctuary Wildlife Awards"

Presented by Greenko

Sanctuary Wildlife awards are presented to Wildlife defenders who are ordinary people of courage, dedication & determination and who set high personal standards for others to emulate. Our Chairman Mr. OP Bhatt gave away the award to Mr. Imran Siddiqui, a young man working in the jungles of Andhra & Telangana for wildlife conservation.

# Awards and Recognitions

## Delivering Performance



### The Unicorn Award

Mr. Mahesh Kolli received "The Unicorn Award" for Greenko by CEO club India. This award is in recognition for showing exponential growth in ten years of operation to become the largest clean energy company operating in India.



### IPPAI Awards 2018

**Greenko** has been awarded as the Best Solar Generator and a Runner-up to the Best Wind Generator by IPPAI (Independent Power Producers Association of India). IPPAI Awards are one of the most prestigious awards in the Indian power sector that acknowledges and celebrates the achievements of the Outstanding Performers.



### "Performance Excellence Awards"

for Solar and Wind Plants 2018

**Tanot Wind Power Ventures Pvt Ltd** and **SEI Mihir Energy Pvt Ltd** have been awarded as the best performing solar and wind plants in the country by the Renewable Energy Council (RE Council) of CII-Godrej GBC which has instituted "Performance Excellence Awards".



# D

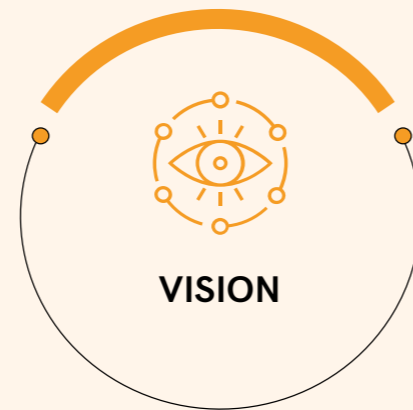


Firm on the bedrock of values, Greenko draws its motivation from its vision and mission. A business with a purpose of generating clean, reliable and affordable energy, Greenko has technologically diverse RE generation asset portfolio that is spread across India in keeping with its transmission and distribution infrastructure and growing demand centers. Greenko's journey so far has been to address decarbonized electricity generation while harnessing new value pools incentivized by the regulations including the open access customers and energy exchanges. Greenko's journey-so-far is characterized by discipline, agility and adaptation. This positions Greenko favourably in its transition from GKO 3.0 to 4.0 in the near future.

# Foundation and Motivation

Greenko Group is committed to transform renewable energy from real-time energy to a dispatchable and controlled medium through digitalization and storage solutions to support the economy-wide drive for deeper decarbonization across sectors in the country.

From its inception, the group is committed to generating clean, reliable and affordable energy and create **#MoreSmilesPerWatt**. The scale of this pursuit is calibrated as per available resources and opportunities. Greenko's values continue to be the bedrock of its foundation, its vision and mission have been a motivating factor driving every pursuit of Greenko.



- To lead Decarbonization, Digitalization and Decentralization of India's Energy Sector.



- Build and Operate flexible utility scale energy assets to deliver demand driven solutions.
- Continuously innovate to deliver best-in-class solutions with life-cycle focus.
- Manage all assets sustainably, leveraging leading-edge technologies.
- Build public-private-people alliances for sustainable development.



## SEED IT

- Stakeholder Inclusiveness
- Excellence
- Ethical
- Discipline
- Innovate
- Teamwork



# Foundation and Motivation



## STAKEHOLDER INCLUSIVENESS

Engage with all the Greenko stakeholders in an inclusive manner for sustainable development of the organization.

## EXCELLENCE

Striving for excellence to deliver roles and responsibilities to achieve measurable results in developing, owning and operating world class assets.

## ETHICAL

Conduct action with fairness, integrity and honesty with all Greenko stakeholders.

## DISCIPLINE

Adherence to company policies and GIMS with a sense of ownership.

## INNOVATE

Adopt and encourage use of technology and innovative approaches to deliver breakthrough business results.

## TEAMWORK

Achieve organizational objectives with respect and dignity towards all participants of Greenko in a positive and collaborative work environment.

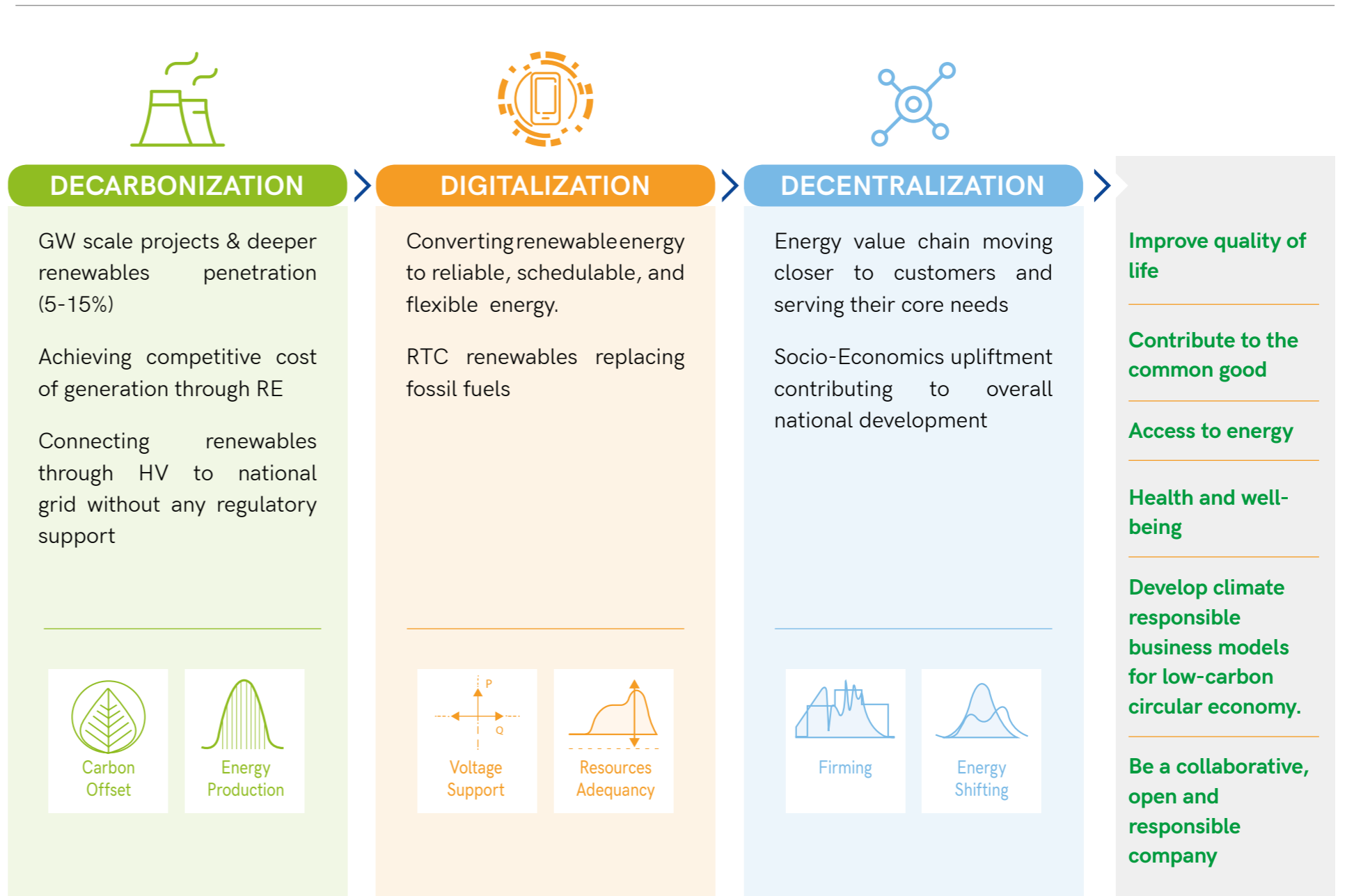
# Business with a Purpose

Greenko is one of the leading renewable energy companies in India, with assets across solar, wind, hydro, biomass and gas-based power generation. It presently has an installed generation capacity of 4.8 GW across 13 states in India, with another 20 GW in the pipeline.

Greenko is leading the decarbonization, digitalization and decentralization of the Indian energy market with a road map under implementation for utility-scale, clean and affordable energy to meet the country's longterm energy security needs. The group is committed to transforming renewable energy from real-time energy to a dispatchable and controlled medium through digitalization and storage solutions to support the economy-wide shift towards a carbon-neutral electricity mix in the Country. Greenko Group has adopted a long-term view of business, guided by strong corporate values, high ethical standards, and an able shareholder base that includes sovereign wealth funds GIC and ADIA. Greenko's ultimate holding company is Greenko Energy Holdings, which is incorporated in Mauritius.

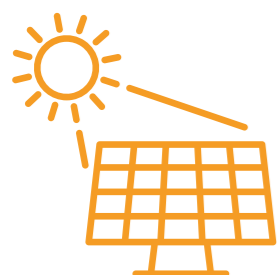


<b>4.8GW</b> Installed Capacity	<b>100+</b> Sites	<b>15</b> States in India	<b>2,000+</b> Employees	<b>2,000+</b> Length of transmission line (km)	<b>5.9 Mn</b> Co <sub>2</sub> Emission avoided	<b>2.3 Mn</b> No. of households powered
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# Our Portfolio

The three Business verticals of Greenko - **Solar, Wind, and Hydro.**



## Business in Solar Power

Greenko has developed, engineered, constructed and currently operates many of India's grid parity, utility-scale solar assets strategically situated across the country's landscape. As a result of strong execution and partnerships with Tier-1 technology suppliers, Greenko is able to expedite implementation efficiently in a shorter period. Using the best of cutting-edge technology and benchmark system operations, the solar assets by Greenko yield high energy in real-world conditions with stable grid integration.



## Business in Wind Power

India has rich, untapped wind energy resources that can play a pivotal role in the country's growing power story. Greenko specializes in the full spectrum of wind power solutions with an extensive portfolio of reliable and technologically advanced projects. With operational wind farms strategically located in places with the highest wind potential, Greenko's wind farms are precisely engineered to yield maximum energy and optimized wind farm performance adapted to diverse operating conditions. By harnessing wind resource, transmission infrastructure and generation technology, the group is actively contributing to the country's transition from fossil fuel dependency to clean energy generation.



## Business in Hydro Power

A powerful source of natural energy, hydro-power accounts for around 20 percent of global electricity producing plants. Greenko is leading the Indian Hydro sector within small and medium Hydro space. Operating at a capacity of 489 MW and over 1000 MW in pipeline, the company primarily concentrates on run-of-river hydroelectric projects. The portfolio of Greenko is diverse in hydrology and clusters across North and South of India through its subsidiaries.

# Our Portfolio

## Wind Portfolio

**2,358 MW**

Operating Capacity

**36**

Number of Wind Plants

**1,184**

Turbines

**1,624 km**

Transmission Line

## Solar Portfolio

**1,905 MWp**

Operating Capacity

**49**

Number of Solar Plants

**1,931**

Inverters

**290 km**

Transmission Line

**6.63 Million**

Solar Modules

## Hydro Portfolio

**489 MW**

Operating Capacity

**24**

Number of HydroProjects

**62**

Turbines

**233 km**

Transmission Line

# Our Projects in pipeline

A total of fourteen projects are under construction with licensed capacity of 584.1 MW, comprising two wind projects with a licensed capacity of 160.0 MW, six hydro power projects with a licensed capacity of 244.1 MW and six solar energy projects with a licensed capacity of 180.0 MW. There are also 6 hydro power projects under active development with a total licensed capacity of 369.0 MW. We are also constructing two integrated renewable energy storage projects ("IRESP"), the Pinnapuram Pumped Storage Project and the Saundati Pumped Storage Project, with a total pumped storage capacity of 2,460.0 MW equivalent to 22.1 GWh with the national grid connectivity. The IRESPs are expected to harness the power of solar and wind resources with digitally connected storage infrastructure to provide scheduled and flexible power to the grid.


## IRESP under planning

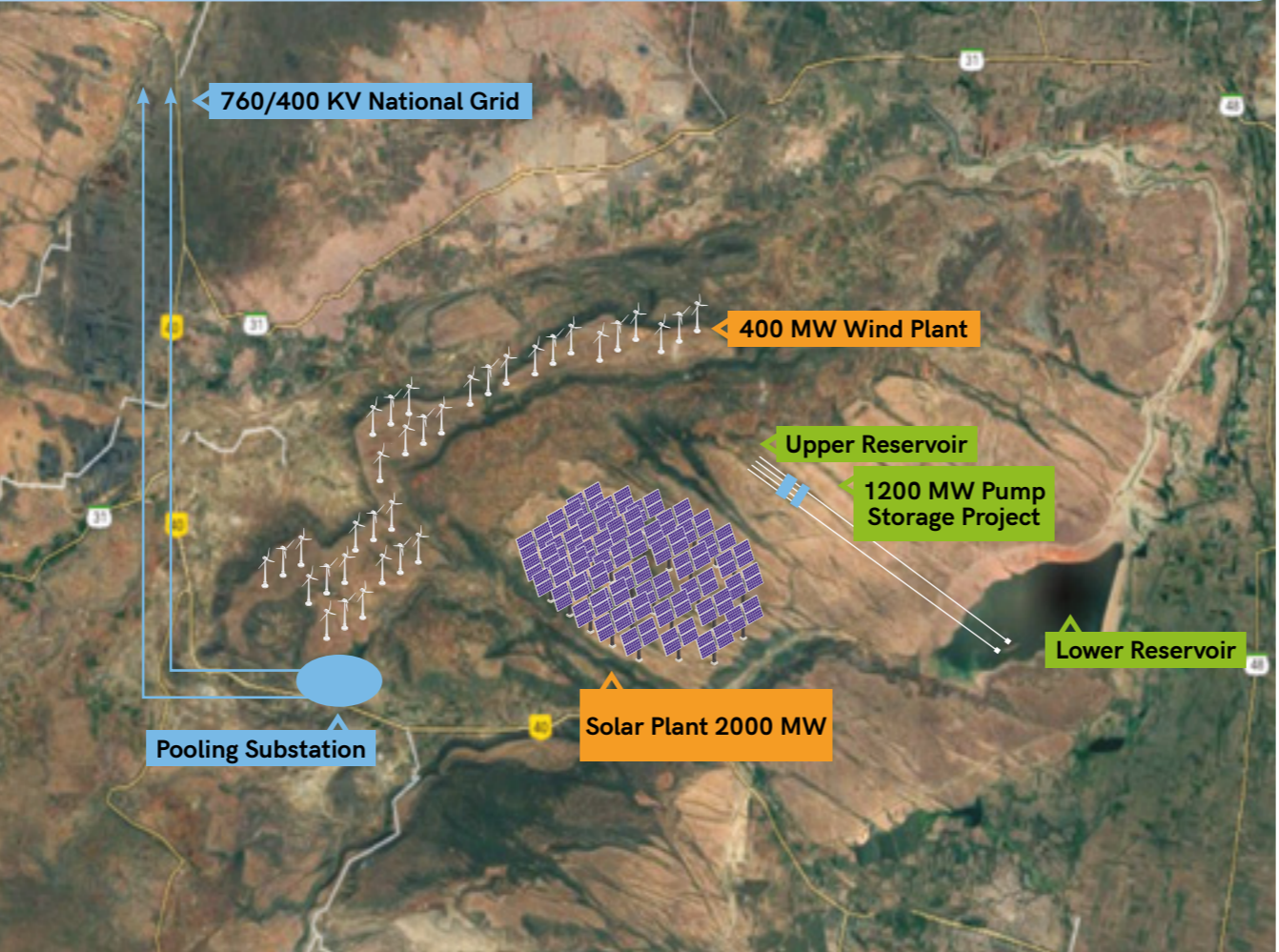
Harnessing the expertise and experience across solar, hydro and wind technologies to address the challenge of schedulable renewable power, Greenko is planning two Integrated Renewable Energy Projects and one among these is at Pinnapuram, Andhra Pradesh. The project consists of 2000 MW of solar, 400 MW of wind and 1200 MW of hydro pumped storage. It will generate 7 Billion units. Further details of this project are provided below:

### Project details and illustrative site layout (Pinnapuram, Andhra Pradesh)


**Location**  
1200 MW PSP in Pinnapuram, Andhra Pradesh

- Capable of servicing:  
Peakload  
Baseload  
Flexible power products







**IRESP at Pinnapuram**



**Pumped Storage**  
1200 MW



**Solar**  
2,000 MW




**Wind**  
400 MW

# Our Operational Presence

Greenko's operational assets are located across India to harness the best available renewable energy resources and infrastructure for evacuation. The locational advantage positions Greenko for further growth in the clusters.

State	Project Name	Technology	Capacity (MW)	
<b>Andhra Pradesh</b>	1. Pinnapuram*	IRESP	4860 MW	
	2. Ghani Solar Park	Solar	816 MWp	
	3. Amidyala	Wind	227 MW	
	4. Rayala Wind Farm	Wind	179 MW	
	5. MPR Darn	Wind	104 MW	
	6. Borampalle Wind Farm	Wind	103 MW	
	7. Belguppa	Wind	101 MW	
	8. Nimbagallu	Wind	100 MW	
	9. Animala	Wind	84 MW	
	10. Guttaseema	Wind	80 MW	
	11. Sandia	Wind	50 MW	
	12. Greenflash	Solar	41 MWp	
	13. Arushi	Solar	39 MWp	
	14. Rain Coke	Solar	33 MWp	
	15. Poly	Wind	24 MW	
	16. Jed	Wind	24 MW	
	17. Sriram - Andhra Pradesh	Solar	23 MWp	
	18. Vayuputra	Wind	20 MW	
	19. Rayachoti	Solar	11 MWp	
	20. Makkuva*	Solar - Battery	5 MW	
	21. Kasumuru*	Solar-Battery	5 MW	
<b>Arunachal Pradesh</b>	1. Rego*	Hydro	97 MW	
	2. Rapum.	Hydro	81MW	
	3. Pernashelpu.	Hydro	81MW	
	4. Kangtangshin*	Hydro	75 MW	
	<b>Delhi</b>	1. DMRC	Solar	4 MWp
	<b>Gujarat</b>	1. Charanka	Solar	53 MWp
		2. Maliya	Wind	40 MW
	<b>Himachal Pradesh</b>	1. Sorang*	Hydro	100 MW
		2. Harsar*	Hydro	70 MW
3. Budhil Hydro		Hydro	70 MW	
4. Bharmour*		Hydro	45 MW	
5. Ravi River Basin Cluster		Hydro	32 MW	
<b>Karnataka</b>	1. Saundatti*	IRESP	4860 MW	
	2. Rona & Gadag*	Wind Solar - Hybrid	1500 MW	
	3. Pavgada.	Wind Solar - Hybrid	1500 MW	
	4. Fortune Five Wind Farm	Wind	165 MW	
	5. Vyshali Wind Farm	Wind	100 MW	
	6. Devrahiparigi Wind Farm	Wind	100 MW	
	7. Pavgada Solar Farm	Solar	90 MWp	
	8. Chitradurga Solar Farm	Solar	66 MWp	
	9. Gurmitkal	Wind	60 MW	
<b>Madhya Pradesh</b>	6. Suttelj River Basin	Hydro	44 MW	
	7. Beas River Basin Cluster	Hydro	25 MW	
	8. Lassa*	Hydro	24 MW	
	9. Jeori	Hydro	10 MW	
	10. Netravathi River Basin Cluster	Hydro	60 MW	
	11. Kustagi	Wind	50 MW	
	12. Saroja	Wind	50 MW	
	13. Hemavathy MHS	Hydro	24 MW	
	14. Shanay	Wind	21 MW	
	15. Ramanakoppa*	Solar	20 MW	
	16. Chandragutti*	Solar	20 MW	
	17. Jasper MHS	Hydro	11 MW	
	18. Sai Spurthi MHS	Hydro	10 MW	
	19. Hipparigi*	Solar	5 MW	
	<b>Maharashtra</b>	1. Suvaan	Solar	138 MWp
		2. Ratnagiri Wind	Wind	102 MW
		3. Khanapur	Wind	34 MW
	<b>Rajasthan</b>	1. Tanot Wind Farm	Wind	120 MW
		2. Bhesda	Wind	40 MW
3. Dalot & Devgarh		Wind	23 MW	
4. Dalot		Wind	20 MW	
<b>Tamil Nadu</b>	1. Poovani	Wind	200 MW	
	2. Adhavan	Solar	60 MWp	
	3. Kathiravan	Solar	60 MWp	
	4. Phoebus	Solar	60 MWp	
	5. RT Renewable	Solar	18 MWp	
	6. Adityashakti	Solar	13 MWp	
<b>Telangana</b>	1. Adilabad*	IRESP	2000 MW	
	2. NTPC - Karvy	Solar	77 MWp	
	3. Zuka	Solar	74 MWp	
	4. Jilesh	Solar	70 MWp	
	5. Sunbrone	Solar	45 MWp	
	6. Karvy	Solar	22 MWp	
<b>Uttarakhand</b>	7. Sriram - Telengana	Solar	22 MWp	
	8. Ellanthakunta	Solar	12 MWp	
	9. Talmadla	Solar	12 MWp	
	10. Chennur	Solar	12 MWp	
	11. Kowdipalli	Solar	10 MWp	
	12. Digwal	Solar	9 MWp	
	13. Shankapur	Solar	9 MWp	
	14. Manakondur	Solar	6 MWp	
	1. Swasti HEP	Hydro	23 MW	
	<b>Uttar Pradesh</b>	1. Dhruv Milkose	Solar	1 MWp



-  Solar Operational
-  Solar Under development
-  Wind Operational
-  Wind Under development
-  Hydro Operational
-  Hydro Under development
-  IRESP
-  Wind Solar Hybrid
-  Solar Hydro Hybrid
-  Corporate Office
-  Regional Offices
-  Cluster Offices

\* Projects under development

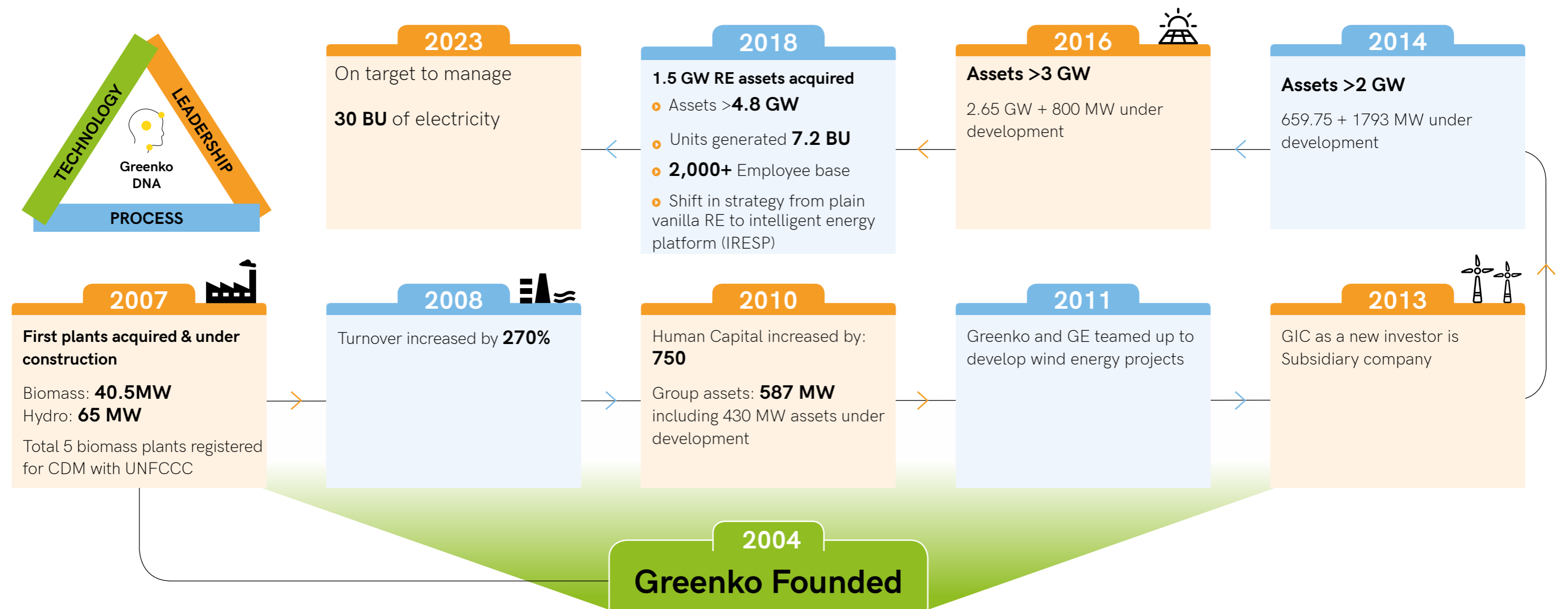
# Journey so Far

Greenko's journey so far has been characterized by its ability to identify and harness the best locational opportunities for renewable energy generation through a variety of technologies. Project execution and asset management powers across technologies are supplemented by commercial skills to enter into

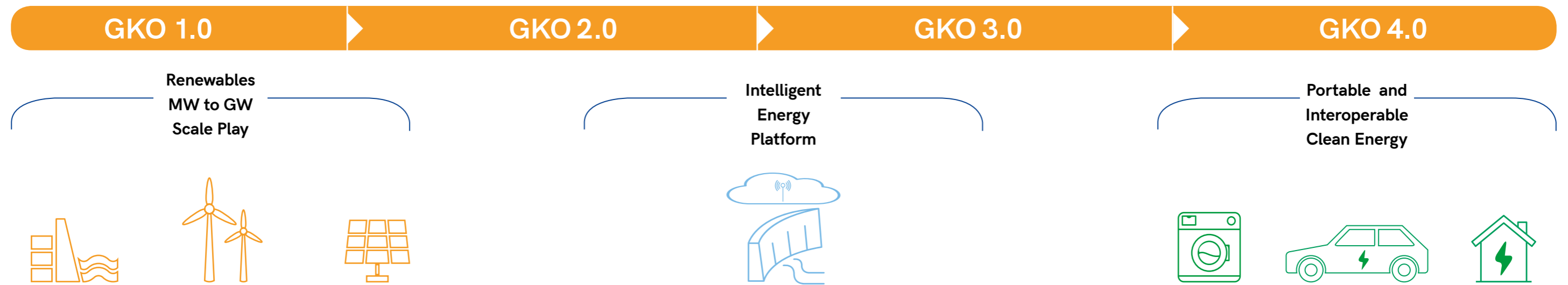
sustainable power purchase agreements with public and private entities.

During the journey, Greenko rightly secured technology partnerships to achieve scale, adopted self EPC and O&M model and improved access to the grid. Greenko

has been accessing institutional consumers directly and is poised to enter the next phase of access to customers and provision of additional services.



# Technology- Adoption-Transformation



- Resource forecasting
- Advanced weather prediction algorithms
- High accuracy field devices / sensors
- Automated analytics and modelling techniques
- Fiber optic technology for real-time data feeds
- Overall voltage regulation and power flow optimization
- Localizing and islanding faults

- Scalable and powerful SCADA solutions
- Advanced image processing and recognition technology
- Unmanned drone technologies
- Energy market management software integration layer
  - IEX and other regional trading markets

- AI and ML based energy scheduling and dispatch algorithms
- Battery Management Systems (BMS)
  - Advanced self-optimization battery models
  - Active cell balancing techniques
- Energy Management Systems (EMS) / Energy Communications Unit (ECU)
- Localized control centers based on network optimization
- Real-time customer interaction

- Open IoT cloud architecture
  - Localized interfaces based on individual customer energy optimization algorithms
  - Integration of decentralized energy pools, microgrids, storage, generation and demand layers
  - Smart energy control and monitoring devices
- R&D:**
- Li-ion battery technology research on energy density, safety and volumetric efficiency
  - Hydrogen fuel cells and electrolyzers



E



# Framework of Trust

Stakeholder Trust is one constant at Greenko. The board, its composition and role, is the pivot of Greenko's governance framework. Greenko's unwavering commitment to ethics and compliance reinforces the stakeholder trust.

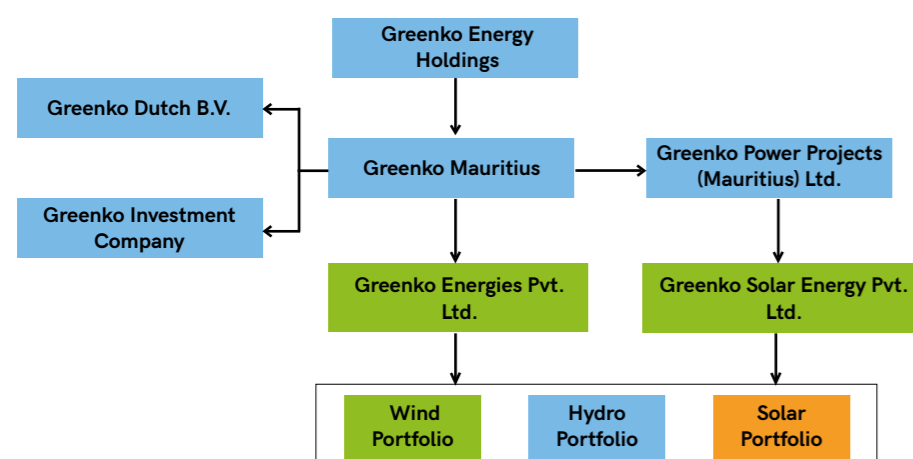
Greenko's risk management practices protects the value creation. Board's guidance on strategy and its deployment enhances the value generation and distribution. The strategic direction set by the board is effectively deployed by capable and experienced management team. The organization is structured to maintain balance; smooth and free flow of information and necessary empowerment. The Greenko Integrated Management Systems provides for systems and processes for the organization to effectively deploy the strategic direction set by the board.

# Governance

The corporate governance practices at Greenko are focused on creating sustained value, retaining and distributing it over the short, medium and long-term amongst all stakeholder groups. Accordingly, the governance structure is designed to guide and oversee the company's pursuit of vision and mission while adhering to its values.

Greenko Energy Holdings together with its subsidiaries ("Greenko Group") is in the business of owning and operating clean energy facilities in India. All the energy generated from these plants is sold to state utilities and other customers including captive consumers through power purchase agreements ("PPA").

The overall Greenko Group structure is presented below



The board periodically reviews strategies and guides the company to protect and enhance its value creation abilities in the face of evolving global and regional developments.

The governance framework sets rules, processes and practices that balance the interests of a company's many stakeholders, such as shareholders, management, customers, suppliers, financiers, government and the community. The governance processes encompass practically every sphere of management, from action plans and internal controls to performance measurement and corporate disclosure.

Our governance framework, established by our stakeholders, is based on the following principles and practices:

- Long-term success and financial and non-financial sustainability
- Diverse composition reflecting the scale and complexity of the business
- Structured timely meetings and appropriate information-flow
- Risk management and control
- Clear division of responsibilities within the Board and the Management

- Board duties managed and supervised by the Board committees
- Structured appraisal system in the Board for each individual director
- Greenko Board takes its stakeholders very seriously. Suitable programs and events are established for the stakeholders

In addition to its primary role of monitoring corporate performance, the functions of the Board include:

- Reviewing and approving potential acquisitions
- Reviewing and approving major capital expenditure items
- Reviewing and approving financing matters
- Monitoring the Parent Guarantor's exposure to key business risks
- Reviewing the strategic direction
- Reviewing and approving the annual budgets as well as the progress against those budgets, and;
- Generally, steering the management of the business

# Strategic Orientation and Supervision

**The Board of Directors of Greenko Energy Holdings actively contribute to define the strategy for each of the strategic business units. It also participates in monitoring the implementation of such plans. The SBU heads report periodically to the Board on the progress made, providing the information necessary for the independent assessment of the departures and corrections in implementation.**

The Board of Directors regularly evaluates the attainment of the strategic objectives. When authorizing the company's Financial Statements, the Board performs a quarterly in-depth analysis of the degree of attainment. The Board bases such assessments on regular third party reports, besides the information provided by the management.

To foster interaction between directors and senior management, the SBU heads attend Board meetings and report on the areas under their responsibility. Directors also meet with division heads individually.

Greenko has a senior management team comprising reputed professionals with extensive experience in the industry. They are in charge of day-to-day management of the business. Under the supervision of the Board of Directors, they ensure that the business is conducted in accordance with the policies and procedures established by the governing bodies.

They report regularly to the Board of Directors with regard to adherence and achievement of the established and agreed strategic objectives.

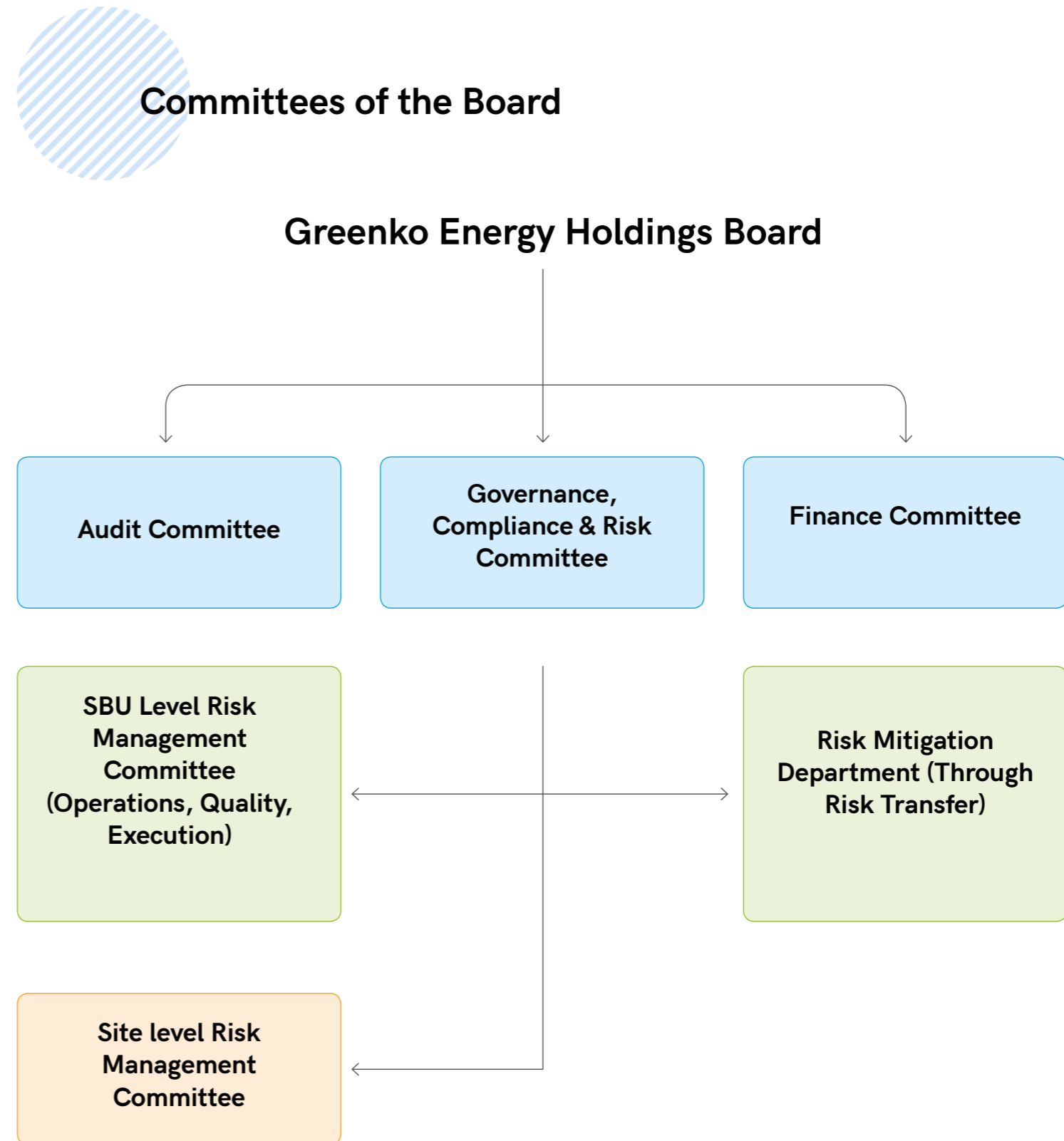


▲ Leadership team visit to Dikchu HEP

# Committees of the Board

Greenko's Board of Directors comprises of thirteen members: two executive directors, three independent directors. The Board members have diverse functional and sectorial expertise with experience.

Greenko has the following board committee structure consisting of Audit committee, Compliance & Risk committee and Finance committee.



# Committees of the Board

**The Board has constituted two committees with the following membership and scope:**

## Audit and Risk Committee

The terms of reference of the Audit and Risk Committee include the following:

- Overseeing and planning all audit activities and the definition of the scope of those activities;
- Monitoring the integrity of the financial statements and any announcement or communications relating to financial performance;
- Reviewing internal financial controls, reviewing the Company's internal control and risk management systems;
- Reviewing internal risk assessment reports and the evaluation of actions intended to mitigate identified risks;
- Monitoring and reviewing the effectiveness of the internal audit function;
- Making recommendations to the Company's Board of Directors in relation to the appointment, re-appointment and removal of the external auditor and approving the remuneration and terms of engagement of the auditor; and
- Reviewing the auditor's independence and objectivity.

The Audit and Risk Committee is required to meet at least three times in a year, including once before the finalization of annual accounts and once every six months.

## Remuneration and Nomination Committee

The Remuneration Committee and Nomination determine Greenko's remuneration policy, in regards to performance standards and existing industry practice. Under the existing policies of the Company, the Remuneration and Nomination Committee determines, *inter alia*, the remuneration and benefits package payable to the Directors.

Apart from discharging the above-mentioned functions, the Remuneration and Nomination Committee also discharges the following functions:

- Setting up the remuneration policy for all executive directors and the Company's chairman, including pension rights and any compensation payments;
- Recommending the level and structure of remuneration for senior management;
- Recommending appointments to the Board of Directors of the Company's subsidiaries;
- Within the terms of the remuneration policy and in consultation with the directors, determining the total individual remuneration package of each designated

senior executive including bonuses, incentive payments and share options or other awards;

- Reviewing and designing incentive plans for approval by the Board of Directors and shareholders;
- Assessing and approving the performance or non-performance of targets set for awarding incentives exercises;
- Determining the policy for, and scope of, pension arrangements for each executive director and other designated senior executives;
- Overseeing the hiring of key executives and members of the Board of Directors;
- Ensuring that contractual terms of termination, and any payments made, are fair to the individual and the Company;
- Planning and preparing for Board succession and development; and
- Considering any other matter that may be referred by the Board of Directors for consideration by the Committee from time to time in respect of employment, remuneration

# Management Team

Greenko has a senior management team comprising of reputed professionals with extensive experience in the industry. They are in charge of the day-to-day management of the business. Under the supervision of the Board of Directors, they ensure that the business is conducted in accordance with the policies and procedures established by the governing bodies. They report regularly to the Board of Directors about the attainment of the established objectives.



**Mr. Anil Kumar Chalamalasetty**

Chief Executive and Managing Director

Mr. Chalamalasetty had an extended entrepreneurial career during which he was involved in evolving start-up businesses in Information Technology, Infrastructure and Environmental sectors in the United Kingdom and India. Mr. Chalamalasetty is experienced in mergers and acquisitions, transition and project management with a successful track record of managing operations involving large remote teams. He co-founded and developed the Company with Mahesh Kolli in 2004 and incorporated it in early-2006 to raise funds for financing early operations. He is responsible for effectively implementing the strategic business road map of the Company. Mr. Chalamalasetty is a graduate in Computer Science and holds a Master's from North West University.



**Mr. Mahesh Kolli**

President and Joint Managing Director

Mahesh started his career in the energy sector and went on to build his entrepreneurial interests in Information Technology and Environmental space. His entrepreneurial journey started with an environmental solutions company focused on technology transfer from developed markets to India. He co-founded Greenko Group along with Mr Anil Chalamalasetty in 2004. Within Greenko, he is responsible for driving the vision, business development and new project initiatives of the Group. Mahesh is a regular speaker at Carbon Market & Clean Energy conferences around the world and is a graduate in Mechanical Engineering from Karnataka, India.



**Mr. Vasudeva Rao Kaipa**

Chief Financial Officer

Mr. Vasudeva Rao Kaipa Joined the Board in Feb 2012. Prior to Greenko, he was an Executive Director for XL Energy Ltd (from 2005) which has diversified interests including significant solar power operations and organized its IPO to the Indian Stock Exchange in 2006. He also served on the Board of Directors of GSS America Infotech Ltd, a Software Services Company which he advised and helped organize its IPO and NEST Ltd. Vasu also served as an Executive Director at Goldstone Technologies Ltd and also worked for Kirloskar Electric, in a number of key finance roles.

# Management Team



**Mr. C Purushotham**

Chief Compliance Officer

Mr. Purushotham is the company secretary for the Group and heads legal, compliance and commercials functions of the company. He has over 30 years of experience in Energy and manufacturing sector including Coal India, as senior member of the Institute of Costs and Works Accountants of India (FICWA) & Institute of Company Secretaries of India (ACS), with bachelor degrees in Commerce (B.Com) and Law (B.L). He is also qualified in the CPA exams conducted by AICPA, USA. Mr. Purushotham leads PPA discussions with utilities, regulatory and commercial consumers and heads risk management functions.



**Mr. Venugopala Rao Naredla**

Senior Advisor

Mr. Naredla Venugopala Rao, former CEO of Reliance Power, a power-sector professional. He has more than 36 years of experience in senior positions like CEO, CFO with Reliance Power, Lanco Group and NTPC. At Greenko he heads project management and asset management.



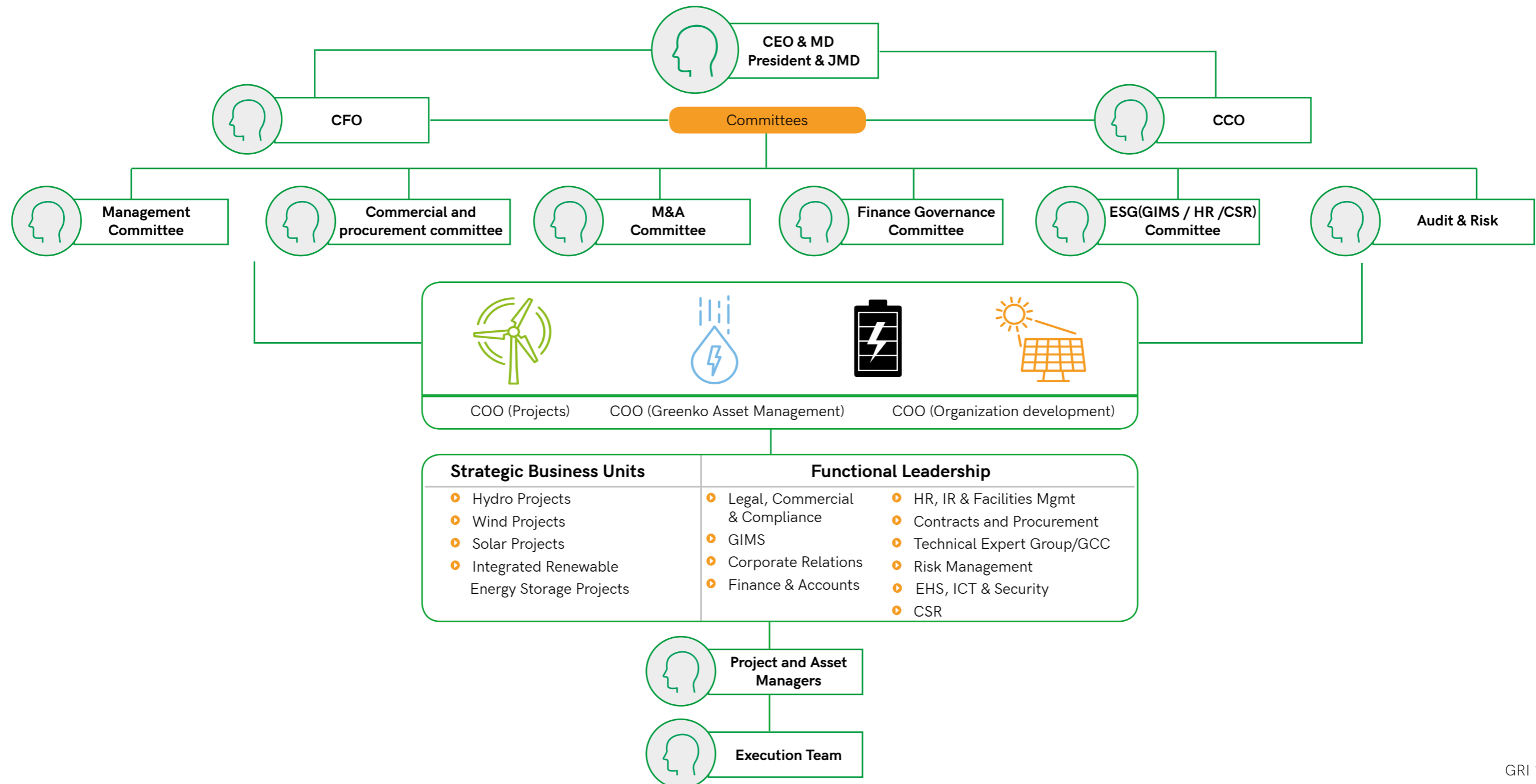
**Mr. Nagendra Dandamudi**

Chief Operating Officer -  
Organization Development

Mr. Dandamudi has over 25 years of experience in leadership positions at various organizations including AT&T, Cable & Wireless and Motorola. At Greenko he leads Greenko's transformation initiatives, Sustainability, Integrated Reporting System, Greenko Integrated Management Systems, HR Strategy and Technology Initiatives.

# Organizational Structure

Greenko practices the matrix organizational structure of working across all businesses and functions. In our matrix model, accountability and responsibilities rests with multiple stakeholders, all functions and departments. Through matrix organization the responsibilities and accountability are distributed among multiple resources.



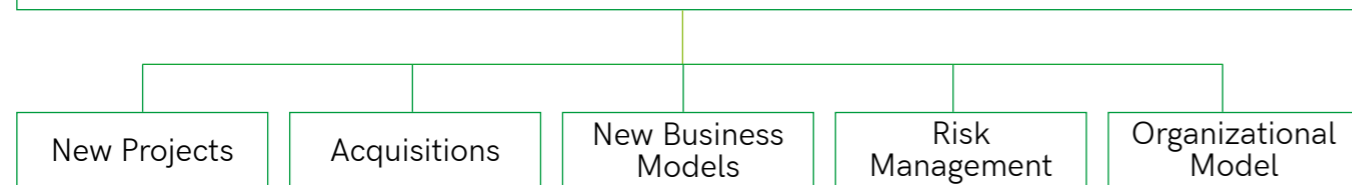


# Board Guidance

During the reporting period, Greenko's Board of Directors have focused on

- (i) Steering the growth, both organic and inorganic
- (ii) Deliberating and approving the exploration on new business models of utility scale clean energy generation
- (iii) Other strategic goals of the Group
- (iv) Reviewing and strengthening risk management
- (v) Designing organizational model

## Significant Board Directions during the FY2018-19



▲ Leadership team visit to Dikchu HEP



# Compliance and Ethics

**The Board and its Audit Committee, have ultimate responsibility for stewarding the organization's ethical climate and compliance, as well as the policies, processes and controls that support it.**

**The Compliance matters are reported to the Board's Audit Committee. The committee periodically reviews compliance status and the efficacy of, the internal procedures, controls. The efficacy of compliance review ensures (i) adherence to the obligations established by law or adopted voluntarily in the ethical, organizational, environmental and social dimensions, and (ii) identification, avoidance and mitigation of the related risks.**

Greenko's instruments for ensuring an ethical climate is articulation and adherence to values in every sphere of activity. Besides all employees are signatories to the code of conduct and Greenko organizes awareness sessions and training Programs to deliberate and demonstrate the ways and means to adhere to its value system and code of conduct.

The company prides itself on the high standards of excellence embodied by its operating principles. Greenko expects its employees to personify these principles in their dealing with people within and outside the organization. The employee code of conduct at Greenko is intended to provide guidelines for the professional, ethical, legal, and socially responsible behavior. As it is impossible for this code to cover every situation that may arise, the employees are encouraged to internalize the underlying principles by undergoing online and offline trainings. The employees are also encouraged to consult and enquire when faced with any situation. In circumstances where the employee is unable to query or consult, he/she is encouraged to use his/her best judgment.

## The code of conduct covers:

- Professional Integrity
- Relationships with Customers
- Relationships with Suppliers

- Relationships with Competitors
- Accurate and Complete Accounting
- Bribes and Kickbacks
- Gifts and Entertainment
- Conflict of Interest
- Confidentiality
- Work Place Communication
- Safety
- Political and Charitable Contributions.

All employees who violate this code in letter and spirit, have an obligation to report to the management or any member of the board of directors. All allegations of improper or illegal behavior are investigated promptly and thoroughly. The investigation remains confidential as practicable and those conducting the investigation respect the privacy of all persons involved. No adverse action is taken or permitted against anyone for communicating observed violations in the code of conduct.

# Risk Management

The Board and the Audit Committee approve the company's risk control and management. They review internal control systems regularly to ensure that the main risks are properly identified, managed and disclosed.

The risks are assessed in qualitative and quantitative terms and plotted on a matrix to ensure that they are evaluated and handled properly on an overall basis. The categorization of risks is based on the likelihood of occurrence, economic and financial consequences, the potential impact on reputation, impact on sustainability and the risk management approach. The company establishes a risk tolerance level. Situations that exceed the risk tolerance level are analyzed individually by the personnel in charge of the business unit, who take mitigating action in coordination with the Risk Management group.

The risk at Greenko Group across the SBUs are broadly classified as:

- Strategic risk
- Economic and financial risk
- Operational risk
- Legal and regulatory risk
- Environmental risk
- Social risk

- Safety and security risk

Presently, Greenko has at the group level, the Governance, Compliance and Risk Management Committee chaired by the Chief Compliance Officer, and who has overall responsibility for overseeing the implementation of risk identification and mitigation. The committee's role includes:

- Propose to the board on Risk appetite, Risk governance, Critical risk related matters and Risk controls.
- Review and verify the systems in place for risk management including internal control.
- Review all risks in the risk register and monitor the progression of stated action once in two months;
- Review trend analysis for all risks;
- Ensure the established processes to manage risk by each team is in place and provide support for action where necessary
- Ensure the processes for managing risks are clearly understood, appropriately delegated and are effectively controlled.
- Escalate issues to the committee of the board as appropriate, particularly the new critical risks or areas of concern of risks graded as high.

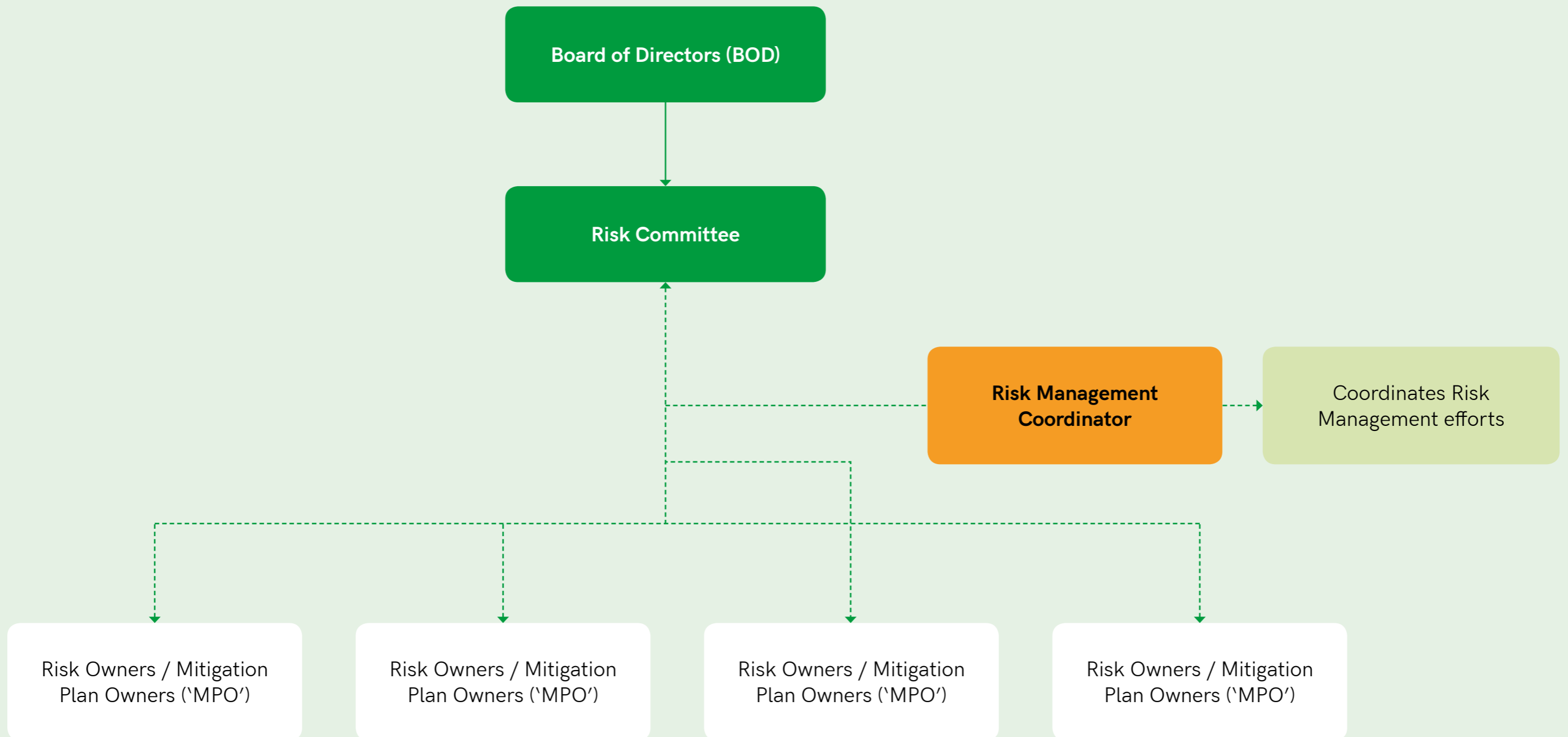
In addition, the SBU Level Risk Management Committee's responsibilities include:

- Ensure that risks are identified, addressed and reported as appropriate.
- Risks graded as Significant (critical / high) are reviewed.
- All Critical risks will be sent to Governance, compliance & risk management committee for review.
- Respond to risks on a day-to-day basics.
- Review all risks in the risk register and monitor progression of stated action on a monthly basis;
- Review the trend analysis for all risks.

Greenko, as directed by its Board, is presently in the process of adoption of Enterprise Risk Management system following COSO principles. The ERM will be:

- A process, ongoing and flowing through an entity
- Effected by people at every level of an organization
- Linked to the strategy, mission and vision of the organization
- Able to provide reasonable assurance to an entity's management and Board of directors
- Managed within the risk appetite at all levels

# Risk Management



# Greenko Integrated Management System

The Group has put in place the Greenko Integrated Management System ('GIMS') that operates in accordance with global best practices, works on establishment, implementation, integration, and maintenance of Quality, Environment, Health & Safety, Information Security, Energy and Social Accountability Management Systems (QEHS-IS-En-SA) as per the requirements of ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007, ISO 27001:2013, ISO 50001:2011 and SA 8000:2014. In addition to ISO standards, the ESMS (environmental and Social Management Systems) as per the requirements of IFC performance standards, Sustainability reporting as per the requirements of GRI Standards and Integrated reporting as per the requirements of IIRC are also integrated into GIMS. Greenko is certified by DNV-GL for implementing ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 & ISO 27001:2013.



▲ Training on Integrated Reporting System

## F



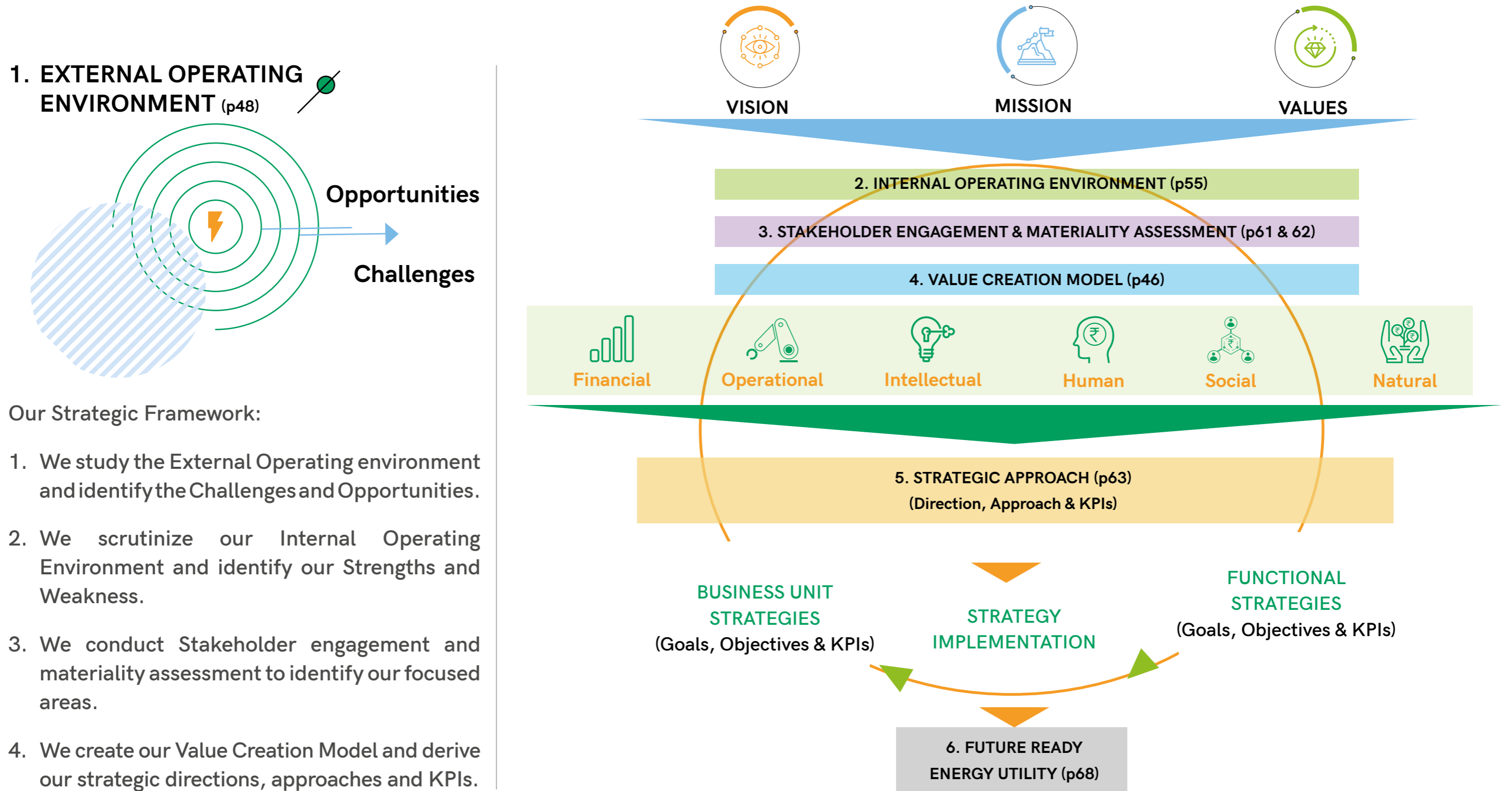
# Value Creation- Greenko Way

The size and spread of assets, the experience, expertise and agility of people, the systems and processes make the organization adaptive. The public-private-people approach to problem solving and care for nature, constitute Greenko's value creation factors. While much of the energy sector is disrupted by increasing electrification, decarbonization, digitalization and decentralization, for Greenko it offers new value pools to harness in short term and a possibility of providing clean, reliable and affordable energy to India in the medium term. The internal operating environment at Greenko has specific strengths and a few challenges in view of its transformative journey to harness opportunities and to enhance value generation.

To seize the moment and harness the historical opportunity **#it'sPossible** to provide clean, reliable and affordable power in India- Greenko would steer itself in strategic directions to be a future ready energy utility.

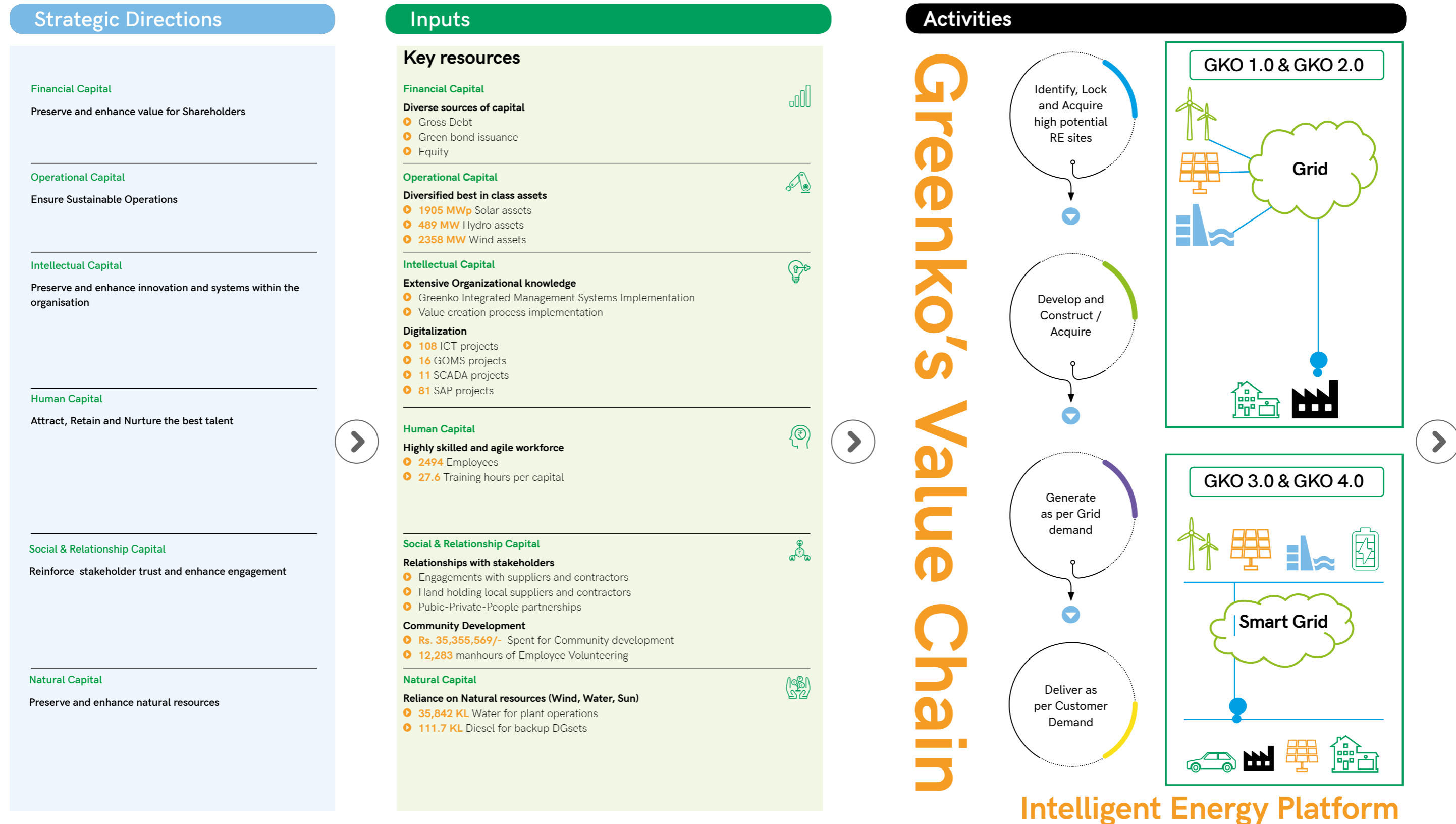
# Integrated Value Creation Framework

Greenko's integrated framework is designed to steer action in pursuit of its Vision and Mission in the face of changing external and internal operating environment. At this stage, the transformation of Greenko from GKO 2.0 to GKO 3.0 is being pursued in response to continuing economic growth in India combined with increasing decarbonization efforts, speedier diffusion of digitalization and decentralization. This integrated framework is designed to determine and pursue action by each function and business to contribute to Greenko transformation and value creation.



# Value Creation Model

At Greenko we optimize our value creation model through effective implementation of our strategy to achieve our Vision & Mission.











# Value Creation Model

## Outputs

### Our products, services, waste.

<p><b>Revenue generated</b></p> <ul style="list-style-type: none"> <li>Total Revenue: <b>485.1 Mn USD</b></li> <li>Revenue from Green bond issuance: <b>17.1 Mn USD</b></li> <li>Revenue from REC : <b>2.2 Mn USD</b></li> </ul>	<p><b>Financial Capital</b></p> 
<p><b>Assured, secured and reliable energy</b></p> <ul style="list-style-type: none"> <li>Renewable Energy generated (GW): <b>7174.8</b></li> <li>Plant Load Factor (%): <b>24.7</b> (S), <b>42.6%</b> (H), <b>24%</b> (W)</li> <li>Machine availability (%): <b>99.65%</b> (S), <b>99.6%</b> (H), <b>98.30%</b> (W)</li> <li>Grid availability (%): <b>99.41%</b> (S), <b>97.9%</b> (H), <b>98.60%</b> (W)</li> </ul>	<p><b>Operational Capital</b></p> 
<p><b>Improved knowledge and skills among the workforce</b></p> <ul style="list-style-type: none"> <li><b>95%</b> implementation of GIMS</li> <li><b>90%</b> implementation of Value creation process</li> </ul> <p><b>Improved Digitalization</b></p> <ul style="list-style-type: none"> <li>% of sites covered under GOMs: <b>75%</b></li> <li>% of sites covered under Forecasting and scheduling: <b>30%</b></li> <li>% of sites covered under SCADA: <b>80%</b></li> <li>% of sites covered under SAP: <b>64%</b></li> <li>Number of sites covered under vulnerability assessment: <b>110</b></li> </ul>	<p><b>Intellectual Capital</b></p> 
<p><b>Empowered employee</b></p> <ul style="list-style-type: none"> <li>Attrition rate: <b>7%</b></li> <li>% of GETs among total recruitment: <b>20%</b></li> </ul> <p><b>Improved health and Safety</b></p> <ul style="list-style-type: none"> <li>Lost time injury frequency rate: <b>0.468</b></li> <li>Total recordable injuries frequency rate: <b>3.147</b></li> <li>Fatalities: <b>0</b></li> <li>Number of trained first aiders: <b>430</b></li> <li>Number of Emergency response trained persons: <b>465</b></li> </ul>	<p><b>Human Capital</b></p> 
<p><b>Improved relationship</b></p> <ul style="list-style-type: none"> <li>Percentage of suppliers / Contractors retained beyond 3 years: <b>95%</b></li> <li>New customers added: <b>6</b></li> </ul> <p><b>Social development</b></p> <ul style="list-style-type: none"> <li>Community development programs= <b>233</b></li> <li>Total number of beneficiaries from the Community Social investment: <b>2,57,895</b></li> <li>Number of co-creation projects done through participation of local community / local bodies/line departments: <b>37</b></li> </ul>	<p><b>Social &amp; Relationship Capital</b></p> 
<p><b>Clean power generation</b></p> <ul style="list-style-type: none"> <li>Number of houses powered with clean power <b>2.3 Mn</b></li> </ul> <p><b>Avoidance of CO2</b></p> <ul style="list-style-type: none"> <li><b>5.9 Mn</b> tons CO2 avoided</li> </ul> <p><b>Emissions to environment</b></p> <ul style="list-style-type: none"> <li>Hazardous waste (kg): <b>45,926.8</b></li> <li>Non-Hazardous waste (kg): <b>2,52,001</b></li> <li>E-Waste (kg): <b>615.2</b></li> </ul>	<p><b>Natural Capital</b></p> 

## Outcomes

### Value created

<p><b>To Greenko</b></p> <ul style="list-style-type: none"> <li>Operating profit</li> </ul>	<p><b>To Stakeholders</b></p> <ul style="list-style-type: none"> <li>Social &amp; Economic Development</li> </ul>
<ul style="list-style-type: none"> <li>Productivity Improvement</li> <li>On-time completion of projects</li> </ul>	<ul style="list-style-type: none"> <li>Improved Access to electricity</li> </ul>
<ul style="list-style-type: none"> <li>New designs and innovations in operations</li> <li>Reliable power generation</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced stakeholder satisfaction</li> </ul>
<ul style="list-style-type: none"> <li>Improved internal skill-base</li> <li>Safe, healthy &amp; lively workplace</li> </ul>	<ul style="list-style-type: none"> <li>Direct and indirect job creation</li> </ul>
<ul style="list-style-type: none"> <li>Shareholder trust</li> </ul>	<ul style="list-style-type: none"> <li>Inclusive development in the regions of operation</li> </ul>
<p><b>Preservation of environment</b></p> <ul style="list-style-type: none"> <li>Decarbonization</li> <li>Air quality improvement</li> <li>Water resource conservation</li> <li>Biodiversity preservation</li> </ul>	<ul style="list-style-type: none"> <li>Climate change mitigation</li> </ul>

### Contribution to UNSDGs

<p><b>7 AFFORDABLE AND CLEAN ENERGY</b></p> 	<p><b>13 CLIMATE ACTION</b></p> 
<p><b>1 NO POVERTY</b></p> 	<p><b>3 GOOD HEALTH AND WELL-BEING</b></p> 
<p><b>6 CLEAN WATER AND SANITATION</b></p> 	<p><b>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</b></p> 
<p><b>14 LIFE BELOW WATER</b></p> 	<p><b>15 LIFE ON LAND</b></p> 

# External Operating Environment

## Mega Forces Shaping New Energy System

### #TheNewEnergy is Electric

Electricity is the fastest-growing source of energy demand today, over the next 25 years. The global electricity supply is also being transformed by the rise of renewable sources of generation such as wind and solar PV. This positions electricity at the forefront of the clean-energy transitions, providing access to the nearly 1 billion people currently deprived, helping cut air pollution and meet climate goals. However, this transition will require a new approach to how power systems are designed and how they operate. Otherwise, rising electrification could result in less secure energy systems, underscoring the urgent need for policy action in this critical sector.

Electricity today accounts for 19% of total final consumption of energy and the share is expected to reach in the business-as-usual scenario to 24% in 2040, very much behind full electrification. Also, not all end-uses can be readily electrified, such as high-temperature heat demand in industry, long-haul aviation and shipping, where electrification is harder to achieve due to either economic or technical barriers. Developing economies will account for much of electrification, as the largest share of new demand, driven by rapid economic and population growth, and increasing policy push towards electrification. Accelerating use of electric vehicles could see demand growth in developing economies increase even more rapidly.

A strong push to electrification which is nothing more than push for electric mobility which is already happening in India, could result in oil demand declining post 2030 and electricity expenditure overtaking oil & gas before 2035.

### #TheNewEnergy is Cool

Electrification alone is not sufficient to meet climate goals; this would require a more comprehensive energy system strategy. Much more widespread deployment of renewables combined with storage can help follow a more sustainable trajectory. Due to falling prices and encouraging government policies, solar PV capacity is surging to overtake wind by 2025 and coal in the mid-2030s to become the second-largest installed capacity globally, after gas. Gas-fired capacity could overtake coal well before 2030, as countries shift away from coal to address GHG emissions and air pollution concerns. However, to address the flexibility and reliability of electricity supply, much of coal could be replaced by renewables and not the gas in countries like India due to challenges of availability and landed cost of gas only if pumped and other storage options are harnessed. Decarbonization in some geographies may become deeper decarbonization making the progress towards 1.5 degrees goal achievable. Connecting it all building flexible power systems to accommodate the transition



# External Operating Environment

to low-carbon electrical systems of the future will be critical to ensure reliability. Government policies will consider flexibility as a core component of electricity system design and management. Flexibility needs are set to increase due to the transforming nature of electricity demand and supply; driven by electrification of mobility and the changes in the way electricity is used on a daily basis. The rising shares of wind and solar PV increase the need for system flexibility improvement interventions to manage the variability of their output.

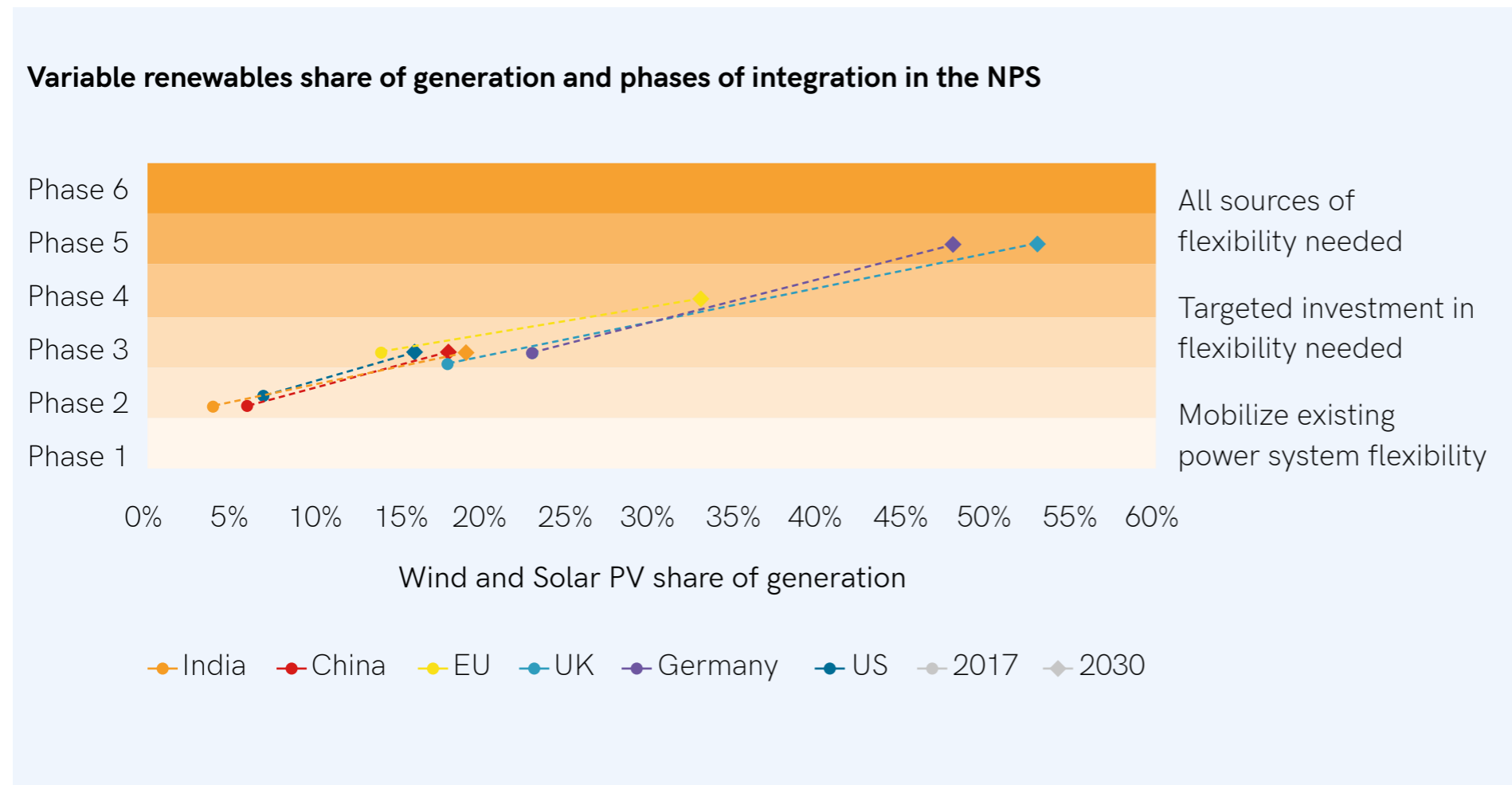
System flexibility needs of a country depend not only on the share of variable renewables in an annual generation, but also is influenced by existing flexibility resources and the match between solar PV, wind and demand profiles. In the near future, as countries experience increased demand for flexibility beyond power plants and transmission interconnections, they would adopt demand-side response and energy storage technologies, including battery storage.

Power sector investment needs to address flexibility to ensure electricity security. Government policy will play an integral role in all markets.

## #TheNewEnergy is Closer to User

The shift to distributed energy systems is opening up opportunities for merchant and retail power, flexible generation and technology-enabled business models.

As industries change and the distribution of power consumption trends towards a growing number of smaller economic hubs, there is less need for large central power stations. In their place, expect to see an increase in small-scale generation. A society and economy that depends on electricity supplied by a highly complex, digitalized set of decentralized energy systems opens itself up to potentially serious issues, such as cyber crime or systemic failure. A small-scale, decentralized generation depends on a robust and reliable grid to provide flexible power without blackouts. A smart grid complete with energy storage to capture excess power for periods of high demand and interconnectors to facilitate trading will be required to match supply to demand at all times. This challenge can be addressed through advances in digitalization and Intelligent Energy Platform.



# External Operating Environment



## India is at the cusp

Power is one of the most critical components of infrastructure crucial for the sustainable development of India. India's power sector is well diversified with sources of generation range from conventional such as coal, lignite, natural gas, oil, hydro and nuclear power to viable non-conventional such as wind, solar, and agricultural and domestic waste. Electricity demand in the country has increased rapidly and is expected to rise further in the years to come. To meet the increasing demand for electricity in the country, massive addition to the installed generating capacity is required.

The Indian power sector is undergoing a significant change and sustained economic growth continues to drive electricity demand in India. The Government of India's focus on 'Power for All' has accelerated capacity addition in the country. At the same time, the competitive intensity is increasing at both the market and supply sides (fuel, logistics, finances, and manpower). Total installed capacity of power stations in India stood at 356.82 Gigawatt (GW) as at the end of the reporting period.

Between April 2000 and March 2019, the energy sector attracted US\$ 14.32 billion in Foreign Direct Investment (FDI), accounting for 3.41 percent of total FDI inflows in India. This is in accordance with the focus of GoI to promote sustained industrial growth. Some initiatives



# External Operating Environment

by the Government of India to boost the Indian power sector:

- A draft amendment to Electricity Act, 2003 discusses separation of content & carriage, direct benefit transfer of subsidy, 24\*7 power supply is an obligation, penalization on violation of PPA, setting up Smart Meter and Prepaid Meters along with regulations related to the same.
- Ujwal Discoms Assurance Yojana (UDAY) was launched by the Government of India to encourage operational and financial turnaround of State-owned Power Distribution Companies (DISCOMS), and reduce Aggregate Technical & Commercial (AT&C) losses to 15 percent by FY2018-19.
- The Ministry of New and Renewable Energy set solar power tariff caps at Rs. 2.50 (US\$ 0.04) and Rs. 2.68 (US\$ 0.04) unit for developers using domestic and imported solar cells and modules, respectively.
- The Government of India approved National Policy on Biofuels - 2018, the expected benefits of this policy are health benefits, a cleaner environment, employment generation, reduced import dependency, boost to infrastructural investment in rural areas and additional income to farmers

Many milestones have been achieved along the way, which include:

- India's rank jumped to **24** in 2019 from 137 in 2014 on World Bank's Ease of doing business - "Getting Electricity" ranking.
- Energy deficit reduced to **0.4%** in FY2018-19 from **4.2%** in FY2013-14.
- **100%** village electrification achieved.

The Government of India has articulated its decarbonization roadmap to achieve 175 GW capacity in renewable energy by 2022, which includes 100 GW of solar power and 60 GW of wind power. This will be supplemented by its decentralization drive - 'rent a roof' policy for supporting its target of generating 40 gigawatts (GW) of power through solar rooftop projects by 2022.

All the states and union territories of India are on board to fulfill the Government of India's vision of ensuring 24x7 affordable and quality power for all by March 2019.



# External Operating Environment

## Deeper Decarbonization in India

In the future, India is set to contribute more than any other country to the projected rise in global energy demand, around one-quarter of the total. Urbanization will be a key driver of this trend as an additional 315 million people are expected to live in India's cities by 2040. This will push up the demand from energy-intensive sectors (IEA, India Energy Outlook, 2015)

As a part of its international commitment, India put forward eight Nationally Determined Contributions (NDCs) under the Paris Agreement of UNFCCC, India would increase the share of renewables in power generation to 22% in 2032 and capacity to 45% to 2030. As a result of this transition to clean energy, as per working paper on the subject by Niti Ayog, the Government of India, cumulative CO<sub>2</sub> emissions from the power sector will reduce by 375Mt CO<sub>2</sub> but total emissions, which decrease by only 5%. Also, performance on emissions intensity improves significantly—falling by 41% by 2032, relative to 2017 level and 80% compared to 2005 level as mentioned in India's First Biennial Update Report to the United Nations Framework (GOI, First Biennial Update Report to the United Nations Framework Convention on Climate Change, 2015). However, the decline is expected to be slow, the later years in as it gets dampened due to the cumulative increase in absolute emissions. This implies that deeper decarbonization is required to slow down the growth of total CO<sub>2</sub> emissions. Such, deeper carbonization is likely to happen with the decreasing solar

panel prices, improvement of efficiencies in renewable generation technologies and digitalization. Only barrier to deeper decarbonization efforts in India is the lack of schedulability of renewable generation.

### New Value Pool- Schedulable Renewables

Deeper decarbonization is imperative across the globe and in India. India is committed to taking leadership in climate mitigation and also technology improvements are driving increasing share of clean components of electricity generation capacity. This will drive the new value pool in electricity generation- schedulable renewable power.

The Central Electricity Authority of GoI, recently arrived at an optimal cost electricity generation using generation expansion planning tool. Objective of this study is to optimize (i) the costs associated with operation of the existing and committed (planned and under construction) generating stations (ii) the capital cost and operating cost of new generating stations required for meeting peak electricity demand and electrical energy requirement while satisfying different constraints in the system such as:

- Fuel availability constraints.
- Technical operational constraints viz. minimum technical load of thermal units, ramp rates, start-up and shut-down time etc.

- Financial implications arising out of start-up cost, fuel transportation cost etc.
- Intermittency associated with renewable energy generation.

### Typical Median Flexibilization costs of present power generation plants

Power generation type / category	Load Following cost (typical ramp rate - %) (Rs./MW) per load following
Up to 200 MW	217.1
500 sub critical	159.25
Super-critical	127.4
Gas combined cycle	41.6

(Ref: Report of Government of India, Ministry of Power, Central Electricity Authority "Committee on Optimal Energy Mix in Power Generation on Medium and Long Term Basis 01-01-2018", pg. 28)

Central Electricity Authority, using this study concludes that the mix given below achieves optimal cost to the economy.

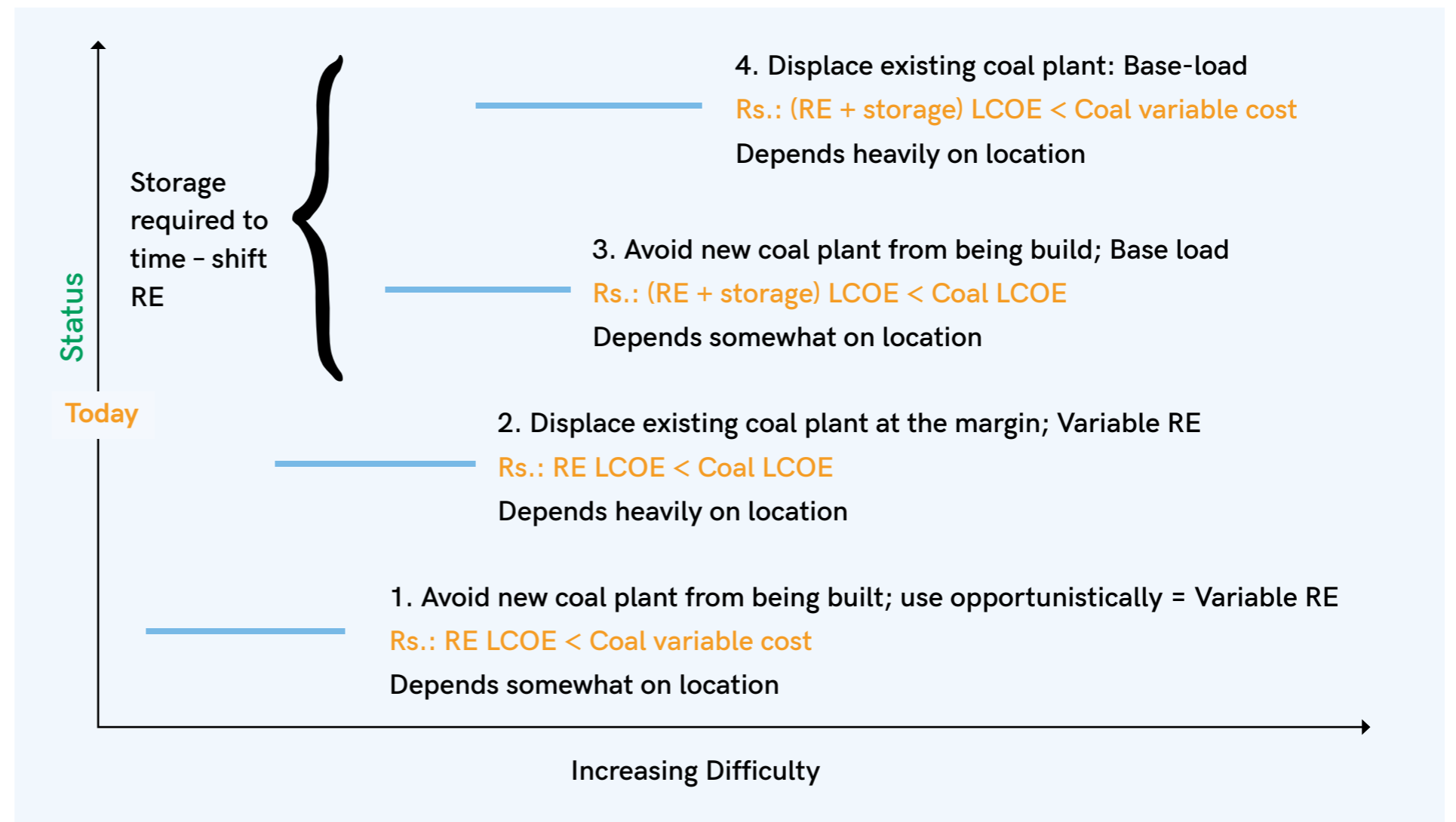
# External Operating Environment

Fuel Type	Capacity (MW) in 2029-30	Percentage Mix (%)
Hydro*	73,445	8.8
Coal + Lignite	2,66,827	32.1
Gas	24,350	2.9
Nuclear	16,880	2.0
Solar	3,00,000	36.1
Wind	1,40,000	16.8
Biomass	10,000	1.2
<b>Total</b>	<b>8,31,502</b>	
Battery Energy Storage	34,000	

The salient part in this optimal mix is 34 GW of storage requirement which is clearly due to intermittency associated with renewable energy generation. With RE technology advances and decreasing capital costs, RE generation, in the future, will be the best cost option. Further, promotion and incentives may be tuned to address schedulable renewables.

**Also, the ladder of competitiveness of renewables vs. Coal in India requires that renewables have to be schedulable for deep carbonization.**

Ladder of competitiveness for Renewable Energy vs. Coal



Also, demand for electricity in India will be significant in many urban centers as additional 315 million people are to join the urban cities by 2030. The industry and transportation within these centers are being envisaged to operate with clean, reliable and affordable power. Already, many businesses in India are contemplating near 50% renewable electricity by 2030 and 100% by 2050, keeping with RE 100 and CDP movement. This is another significant driver for schedulable renewable power generation.

# External Operating Environment

## Need for more Storage in India

Geographical conditions in India range from deserts to long coastlines to the high mountain areas, which means that energy storage technologies can be tested and explored in different scenarios. Also, grid infrastructure may not be in a position to keep up with demand growth. Load-shedding and peak prices have also played a part in reducing consumption. Further, it is an ambitious program to provide electricity to the 43% of households without access through solar home systems or mini-grids. While these can provide a quick solution for electricity access, the requirement of back-up systems in the form of diesel generators, bio-based power generation, or small hydropower or electricity storage would be required. The envisaged Green Energy Corridor aims at strengthening interconnection across states as deployment opportunities may differ substantially among states. The program will also focus on the opportunities for deploying solar PV on city rooftops and close to existing power stations, as part of its ambitious plans. In total, 50-60 GW could be deployed in a distributed manner. India has many opportunities and challenges for storing electricity or integrating renewables.

Storage, coupled with renewable power generation, can address many integration challenges. Regulations, already, provide a favorable situation. The surcharge of Rs. 2.75/kWh for electricity generation during peak

and use of diesel generation (at a cost of over Rs. 18/kWh) to guard against black-outs are some examples. Furthermore, the Indian regulator uses Unscheduled Interchange (UI) and power factor incentives. The Power Grid Corporation of India has three 50-250 kWh demonstration projects in place in the context of its Frequency Response Pilot Project. This includes an advanced lead-acid, a lithium-ion, and a flow battery.

The cost optimal option for storage is pumped hydro power and India has nine such schemes with an aggregated installed capacity of almost 5 GW. Out of this only five with a capacity of 2.6 GW are working in pumping mode. Additional storage capacity requirement by 2022 to address (i) commercial and industrial needs, (ii) to smoothen utility-scale RE generation and (iii) aid captive PV and wind generation is estimated at 3 GW.





# Internal Operating Environment

Organization and people at Greenko are adapting to address the changing external environment and business transformation. Accordingly, ownership model; People, Processes and Systems; and Servant-Leader styles are being adopted.

## One Constant- Living Values

One Constant in Greenko’s operating context is living by values- Stakeholder Inclusiveness, Excellence, Ethical, Discipline, Innovate and Team Work.

Greenko values are explained to every employee and partner. All induction and other relevant sections have significant coverage on detailing of Greenko values and illustrative examples of living by values. The appraisal system at Greenko rewards equal weightage to performance and adherence to company values.



**At Greenko, our future outlook is driven by market needs and opportunities. Our approach to strategy has always been to create value for our customers by developing products that meet their demands.**

**Seshanka Palukuri**

Associate Vice President, Strategic Planning Group



# Internal Operating Environment

## Changing Internal Paradigm- Distributed Ownership

At Greenko, every employee is a responsible steward, embodiment of values and reinforces the brand. Ownership emphasis in Greenko's organizational development is aimed at making individuals and teams fully responsible for the quality and success of both the output and outcomes of their work. Ownership doesn't mean just perfection. It means knowing why you are doing the work (the outcome) and making sure that what you produce (the output) is fit-for-purpose. Ownership is the state of mind of taking full charge of the task and does not give any excuses or blame anyone else for what needs to be done. It also means understanding, learning, and challenging not just following instructions.

At Greenko, individuals and teams are given the authority, autonomy, and accountability for an outcome. Organizations and leaders are transparent about the strategic decisions that are being made. Our employees and teams are accountable for their decisions, as they have the appropriate information not to make a predictably incorrect decision.

At Greenko, enabled by real-time information availability and ownership model, no one is waiting for someone else to do something. The goal is to create an empowered team with accountability, authority and autonomy to achieve business goals. The following organizational transformation initiatives are embedded across Greenko.

### Authorize

The teams are accorded authority to make relevant decisions. To take authority, teams are given clear and unambiguous goals. They are also provided with several "not-the-way" illustrations to prevent them from making wrong decisions, and have access to all relevant information. We encourage teams to make different decisions than their manager would, and direct their managers not to hesitate in supporting the team.

### Align

The compass for autonomous teams has to be congruent to the expected outcomes. Delivering a project on-time and on-budget is not all the "success" - it has to address all relevant stakeholders' expectations. Organizational

journey at Greenko is transition from output-based objectives to outcomes and this system will not curtail the level of delegated ownership possible from the start. We have aligned our KPI's to beyond outputs to include outcomes which enables ownership and innovation.

### Autonomy

At Greenko employees and teams are autonomous but steered and organized. An autonomous team has a guiding vision and support from their leaders. Everyone in the team knows what to do, how to, who to align and coordinate with, and whom to ask for help. At Greenko, as the alignment is to outcomes, teams can only reach autonomy regarding "What" and not restricted to "How".



▲ Openhouse employee engagement with CEO & MD

# Internal Operating Environment

## Greenko Ownership Maturity Model

### Crawl



Ownership for the work and work with others to overcome unanticipated impediments. Ready to challenge decisions if it will improve the quality of the outcome.

### Walk



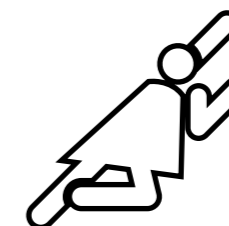
Feel ownership for business outcomes. Willing to challenge decisions and work plans, if necessary, to improve the relevance of their work to the business.

### Run



Will do whatever it takes to achieve an outcome in collaboration. They have the authority, autonomy, and agility to do that.

### Fly



Drive their own responsibility for business outcomes and decision making-collaborate, exceed and transform. This collectively shapes, organizational strategy.

# Internal Operating Environment

## The People, Process and Systems

People, Process and Systems are deployed at Greenko to supplement its ownership model and effect the transformation to GKO 3.0 and 4.0. Greenko believes that transformation is possible and seamless only when people own and steer, processes are clear and understood and systems enable people to adhere and use processes for organizational objectives.

**The PPS was first deployed for Asset Management at Greenko. The objective of PPS deployment at GAM is to**

- Uplift the performance of the assets by way of synergizing the processes
- With no compromise on the essential elements like EHS
- The deployment is expected to deliver the outcome
- Collaborate for vigorous churning of the process flows
- Exceed the target metrics at any point of time.
- Contribute to Transform to GKO 3.0

### The People: Competencies Expected and Delivered



### The Process - Delineating How

As a framework, GAM was divided into seven key areas for which detailed processes were delineated, discussed and adopted in these key areas. Features of the process flows are:

- Cross-functional activities
- Mandated flow of day to day, week over week, month on month activities
- Communication with centralized teams like Tech services
- Checks & balances and way forward in cases of falling short of targets.

### The System- Leveraging Technology

#### Integrated Management Systems

#### Environmental and Social Management System

#### Analytics

- Celeste Solar:** Analyze the trends and identifies any deviation from the expected results

# Internal Operating Environment

- **Forecast & Scheduling:** Deploying statistical forecasting models and real-time weather forecasts to predict day-ahead energy **Activity Tracker**
- **GOMs:** Tracking of Maintenance activities and alerts any form of deviation from schedule or quality
- **GMAT Tracker:** Tracking of minutes of meeting and closing the action items
- **GATS:** Tracking of assets (eg. Modules)
- **GEPS:** Tracking of project activities

## Predictive Measures

- **Drones:** Use of Drone camera in Operations, Maintenance and Surveillance
- **Thermal Imaging:** Thermal Imaging camera to observe the healthiness of modules.
- **Predict Downtimes:** Development of custom notifications based on queries and machine learning models to identify anomalies and predict impending failures

**Greenko has complemented its strengths through ownership model and implementation of the PPS framework. Greenko's renewed strengths would aid its transformation journey.**

## Reinforcing Stakeholder trust

First amongst Greenko values is stakeholder inclusion at all levels and in all decisions. In fact, the public-private-people partnership has been the working norm in project execution and operation. Further, Greenko accepts the ownership of the project and hence builds a long lasting relationship with all the relevant stakeholders. This, Greenko believes is the foundation of trust it has gained amongst all stakeholder groups and this trust will always be renewed as Greenko pursues the transformation journey. This important element is embedded into the ownership model as well as PPS. (GRI 102-21, 43)

## Be Agile to Adapt

Greenko's easy transition from GKO 1.0 to GKO 2.0 has been possible due to the agility of the organization. Ownership and empowerment makes the organization more agile by incorporating some characteristics of self-belief.

## Each One is Responsible Steward

Greenko follows the best practices of governance and responsible stewardship. Ethics, Transparency and Accountability is the hallmark of its governance framework and is an important part of Greenko values. Responsible stewardship is the way Greenko manages the business in a sustainable manner and measures performance against own targets and international benchmarks. Greenko adheres to its Code of Conduct that outlines ethical behaviour along with health, safety and environmental management.

## Information at Decision Point

Greenko deploys advanced information technology to monitor the progress of project execution and asset management and makes such information available to all stakeholders in real-time. This avoids delays, conflicts and friction in decision making and also aids teams to take ownership. It enables the leaders at all levels to focus on material issues for growth and transformation. This platform and associated processes are enablers of PPS.

## Technologically capable superior platform

The Greenko platform is a broad portfolio of technologies, business models and geographies. In energy generation, Greenko has deployed wind, solar and hydro of different technologies, scales and in many geographies. It has been using advanced information and communication technologies to monitor and manage the execution of

# Internal Operating Environment

projects and operation of assets. Further, its forecasting analytics and generating flexibility has significantly improved its commercial outcome of generation. This expertise is being significantly augmented to create an Intelligent Energy Platform. While Greenko's success in deploying different technologies renews its confidence, the organization realizes the challenge of technology adoption and upgradation in the transformation of Greenko's business models for GKO 3.0 and GKO 4.0.

## Disciplined Project Development

In project execution, Greenko follows a very detailed process of self-discipline and agility. Discipline is one of the core Greenko values that define process orientation, deployment of competencies appropriately and using systems adequately. Greenko through its disciplined approach sets an example to its suppliers and contractors to execute projects on time with minimal cost to operate the projects. Greenko understands that the journey towards Greenko 3.0 would be complex, demanding innovation and agility, and synergies of different natures, and hence it has promoted ownership approach across the organization during this reporting period.

## Experienced and largest renewable energy team

Greenko team has significant experience in renewable energy project execution and asset management; arriving at and managing different kinds of commercial arrangements with public and private entities; managing revenues and distributing value amongst stakeholders.

This experience with technologies, people, regulators, distribution utilities and governments will be very critical in our business growth as well as transformation to GKO 3.0 and 4.0. But the technological and regulatory challenges

will be significantly different and the electricity markets will pose new challenges. Accordingly, the experience and competencies during and post-transformation will have to be complemented.



▲ Leadership team at GLS

# Stakeholder Engagement

Engaging with our stakeholders is an essential component of our sustainability strategy. Such engagements are carried out throughout our operations. Our key stakeholder groups include customers, shareholders, bankers, regulatory authorities, employees, suppliers and local communities. We follow a specified mode of engagement with each of these stakeholder groups. We have established effective two-way communication with our stakeholders, allowing us to create

and maintain enduring relationships with all of them. Our engagement with our stakeholders has helped us meet their expectations, thereby providing us with an opportunity to effectively respond to stakeholder concerns. The table below presents our engagement mode and the areas of interest of various stakeholder groups with whom we have engaged for developing this report.

GRI 102-21,40,42,43

Stakeholder Group	Modes of Engagement	Area of Interest
Shareholders, bankers & financial institutions	Regular Board of Directors meetings, Annual Reports, communications with CEO.	Group performance, Policy Compliance and major projects
Regulatory Authorities	One to one engagement and Annual Reports	Compliance
Employees	Employee engagement interventions, Performance review and feedback, Town Halls meets, One on One meetings, Training, Health check-ups, Safety Committee Meetings, Food and Welfare Committee meetings, Inter-departmental meetings, Sports and Recreation activities, Denunciation channels	Career development and management, skill enhancement and building a repository of required skills
Suppliers	Contract management and one to one engagement	Product quality, Pricing and availability, technical requirements, environment aspects, safety, pricing and payment terms
Local Communities	One to one meetings, Public Consultations, Grievance Redressal Meetings, Focused Group Discussions etc.	Community needs and concerns, rural infrastructural development support, health camps and support, educational interventions, scholarship programs support, environment protection and plantations etc.
Customers	Customer feedback, one to one Engagement, Monthly, Half yearly and Annual reviews	Product Quality and Safe Practices

**Stakeholder Engagement - Mode and areas of interest**



# Materiality Assessment

The views of our stakeholders strongly influence what we focus on and what we report.

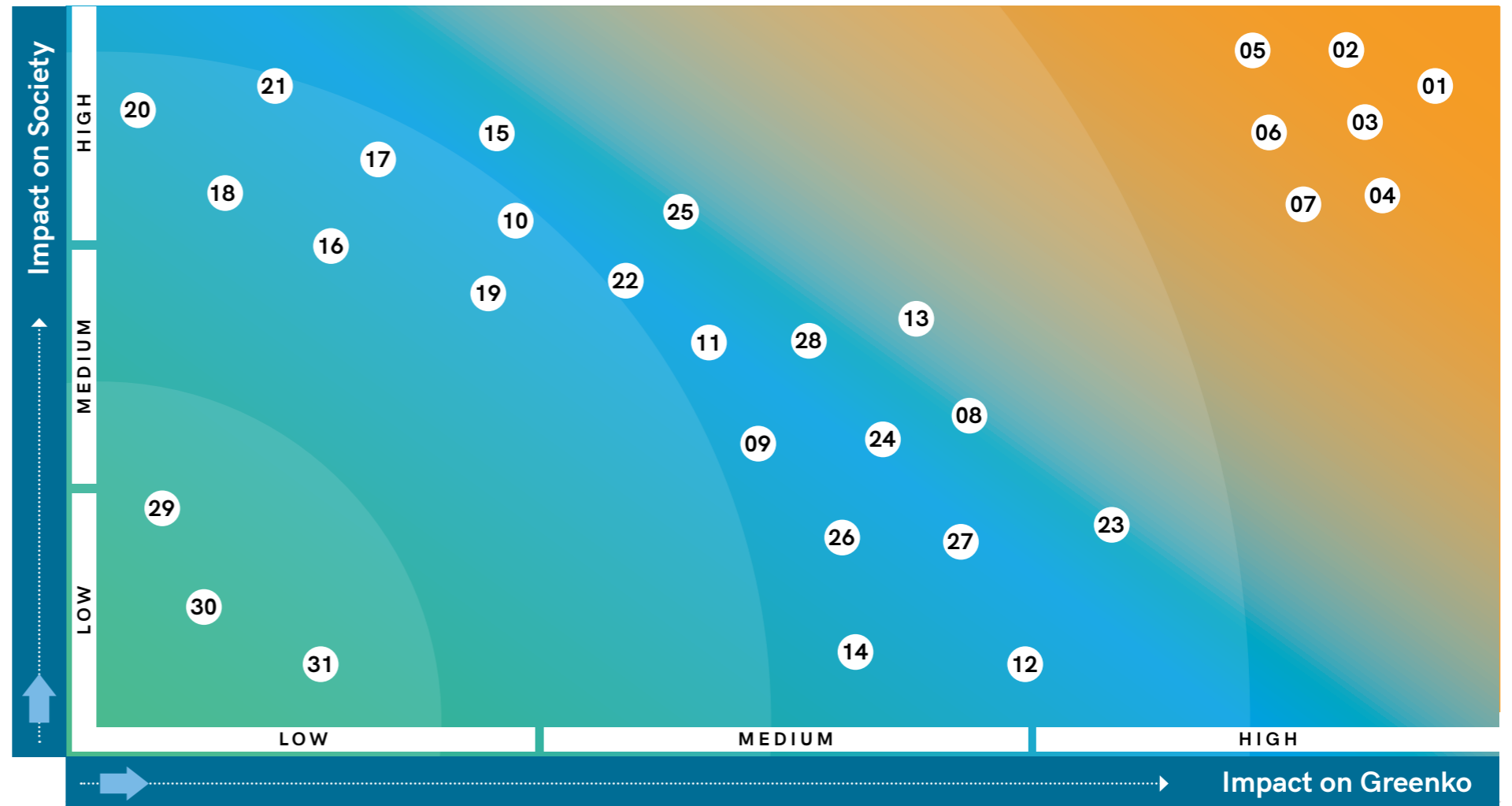
In the process of preparation of this report, the internal stakeholders were extensively consulted through focused group discussions and surveys to arrive at issues that are material to the business.

Consultations with and reports by leading industry bodies regarding matters that could impact the future of energy were also considered.

An issue has been considered material if it influences or likely to influence our ability to create value in the short, medium and long term. Through materiality assessment, the material issues of the company have been identified, segregated and ranked as High, Medium and Low by considering their level of impact on Greenko and its Stakeholders. These material issues are covered in detail in this report.



▲ Materiality Assessment



- High**
1. Economic Performance
  2. Health & Safety
  3. Asset Management
  4. Project Management
  5. Community Initiatives
  6. Technology and Innovation
  7. Public Policy Participation

- Medium**
8. Transparency
  9. Water Management
  10. Climate change and Greenhouse gases
  11. Diversity
  12. Stakeholder Engagement
  13. Responsible Supply chain
  14. Regulatory Compliances
  15. Land Management
  16. Biodiversity
  17. Waste Management
  18. Talent Acquisition and retention
  19. Employee Motivation and Ownership
  20. Human rights
  21. Land acquisition
  22. Risk Management
  23. Anti-corruption
  24. Supply Chain Management
  25. Skill Enhancement
  26. Processes- PPS
  27. Employee Engagement
  28. Training and Education
  29. Energy Management
  30. Succession Planning
  31. Grievance Mechanism

- Low**
29. Energy Management
  30. Succession Planning
  31. Grievance Mechanism



# Our Strategic Approach

The external and internal operating environment further guided Greenko to identify strategic directions, approaches, focus areas and KPI's.

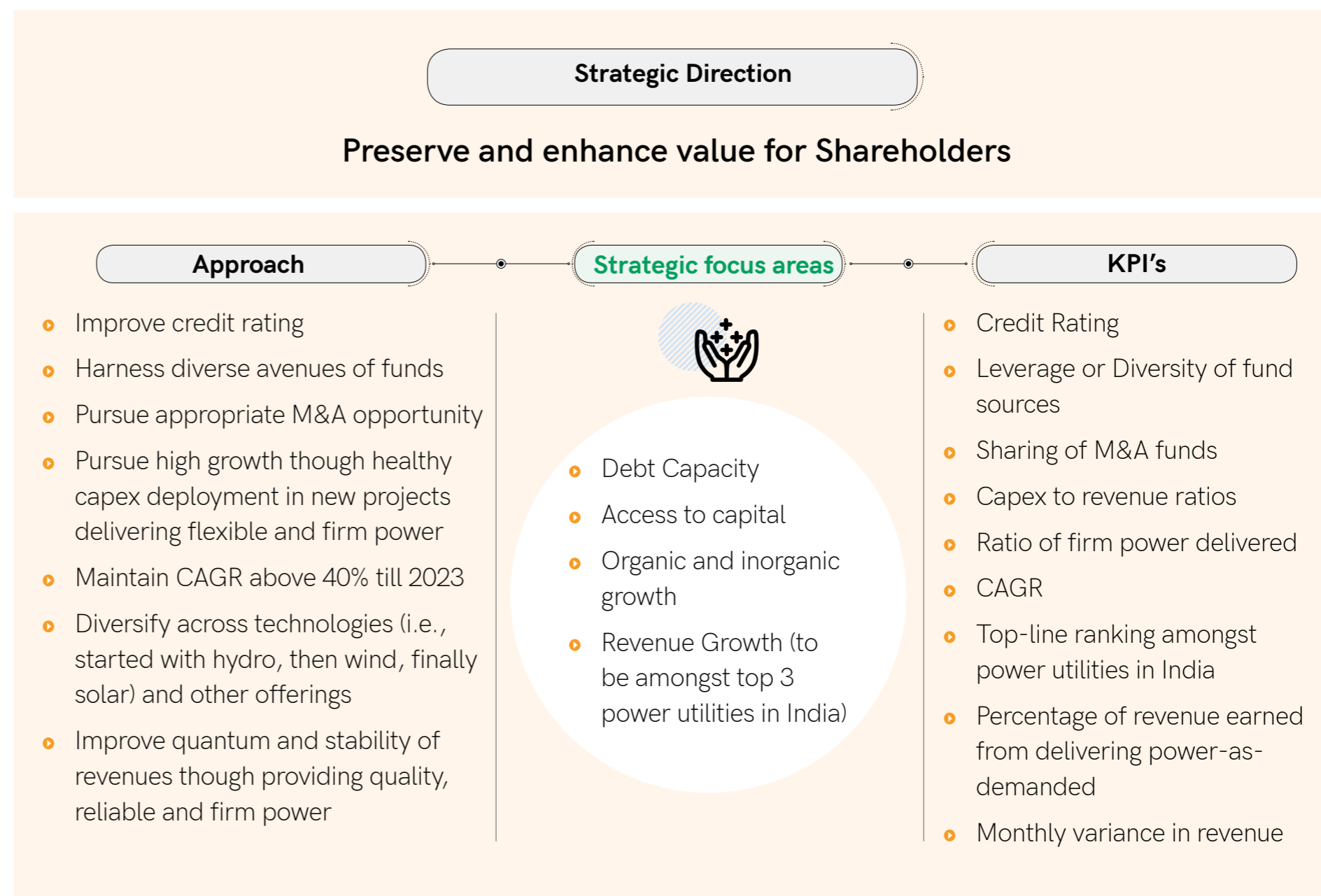
- Mitigate identified risks
- Harness opportunities
- Reinforce strengths and address weaknesses

These strategic directions, approaches, focus areas and KPI's are designed to steer Greenko to GKO 3.0 and stay on course to preserve and enhance the value creation philosophy.

GRI 103-2, 3

## Financial Capital

Commitment to integrity and transparency is the cornerstone of the continued trust enjoyed by Greenko. In the pursuit of its vision and mission, Greenko will have to tap diverse sources of capital, including green/climate/social bonds, and pursue both organic and inorganic growth to continue to be amongst the top 3 power utilities in India.



# Our Strategic Approach

## Operational Capital

The energy sector is going through many disruptions. But this offers a myriad opportunity to Greenko as it is rightly placed to harness all new value pools. Greenko has been preparing to harness the diverse value pools that are available in Indian energy systems. Some of these may involve a marginal improvement and some others- a large project. Over and above this, Greenko continues to be agile and ready to adopt the technology as per the demands of the business. This has implications for our technology, R&D, HR and Operations functions.

### Strategic Direction

## Ensure Sustainable Operations

### Approach

- Harnessing digitalization to improve efficiencies and delivering 24\*7 renewable power
- Improve transparency and real-time information for agility in O&M
- Execute projects with best technology enabled systems
- Increasing share of utility scale round-the-clock RE generation
- Pilot models of "generate- and- Consume" at decentralized level

### Strategic focus area



- Technology Capabilities and Partnerships
- Energy storage value pools

### KPI's

- MTBF or downtime per GWH generation
- O&M Cost per GWH
- Percentage of Power delivered as per schedule
- PAF
- PLF
- On time completion of projects
- Time and Cost overrun (%) in projects
- Capital invested in Generate-consume pilots

# Our Strategic Approach

## Human Capital

People are at the center of Greenko’s pursuits. Nurturing talent and caring for people is a principled commitment at Greenko- it involves attracting, training, rewarding, recognizing and growing. Fair, Safe, Healthy and Lively workplace is furthering such commitment. As the sector is likely to face significant disruptions and challenges, it is imperative that our people are motivated, committed, agile and innovative to enable the company to navigate through turbulent trends and harness opportunities. **Our ownership models drive people to be responsible for outcomes of their work and “transform and be transformed”**

### Strategic Direction

## Attract, Retain and Nurture the best talent

### Approaches

- Attract talent early and Nurture
- Reward, recognize and retain
- Encourage diversity and inclusivity
- Ownership of Outcome
- Improve internal skill-base
- Pursue cross-functional mobility
- Ensure effective succession planning
- Ensure Health and Safety first in choice and design.
- Build capacity and hand-hold contractors and partners to improve health and safety.
- Improve awareness and focus on behavior-based safety

### Strategic focus area



- Nurture Talent and Instill Ownership
- Ensure Safe, Healthy and Lively workspace

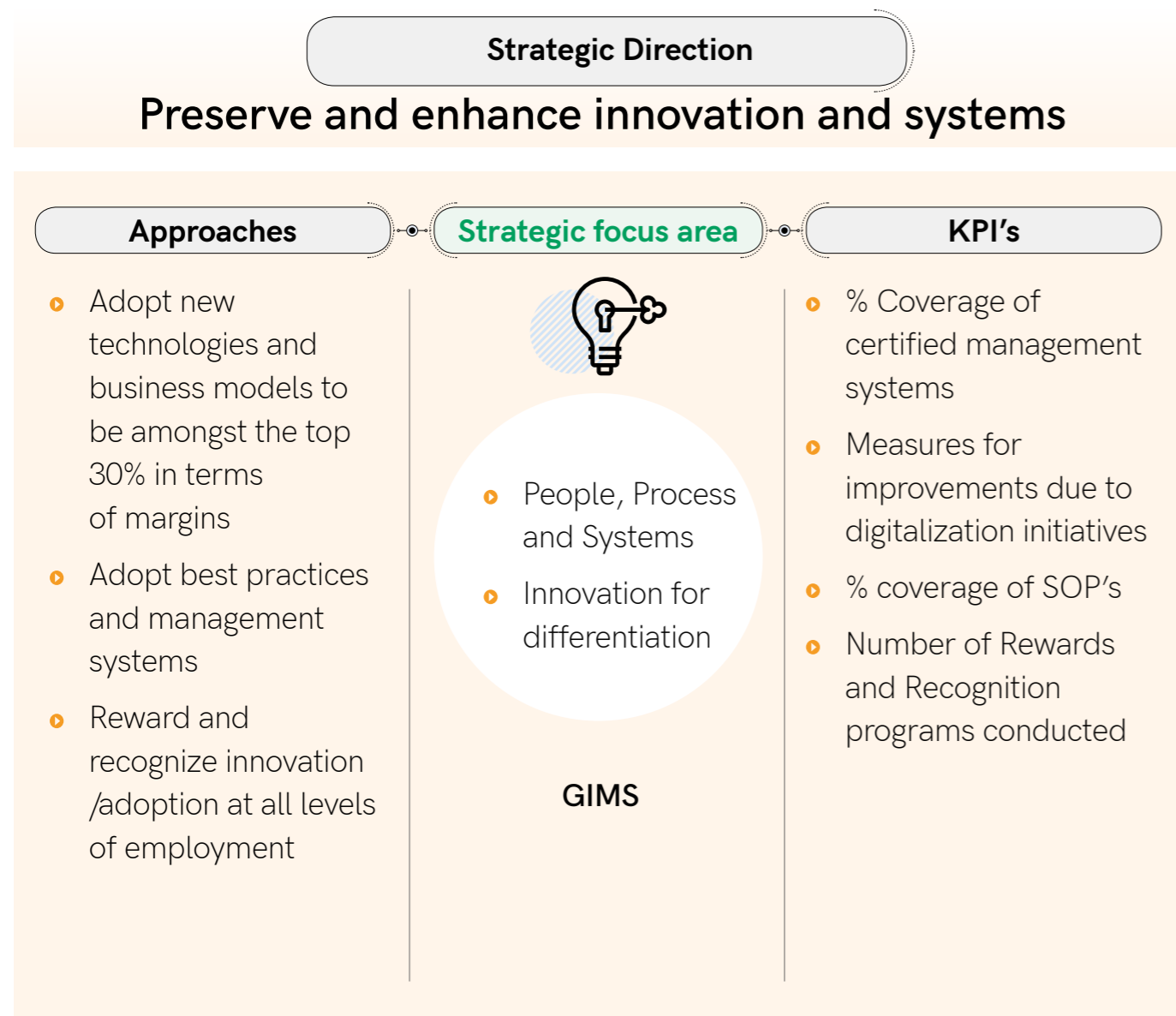
### KPI's

- Percentage of GETs amongst total recruitment
- Overall Retention (%)
- Percentage of people retained in acquisitions
- Percentage of women employees at different levels
- Age and Demographic distribution
- Percentage joined after parental leave
- Number of employee grievances received and resolved
- Number and coverage of employee engagements
- Training hours per capita
- Cross role deployment (person-hours)
- Succession cover (%)
- Number of employees availed mediclaim benefits
- Lost days due to occupational illness
- Lost Time Incidents
- Number of fatalities

# Our Strategic Approach

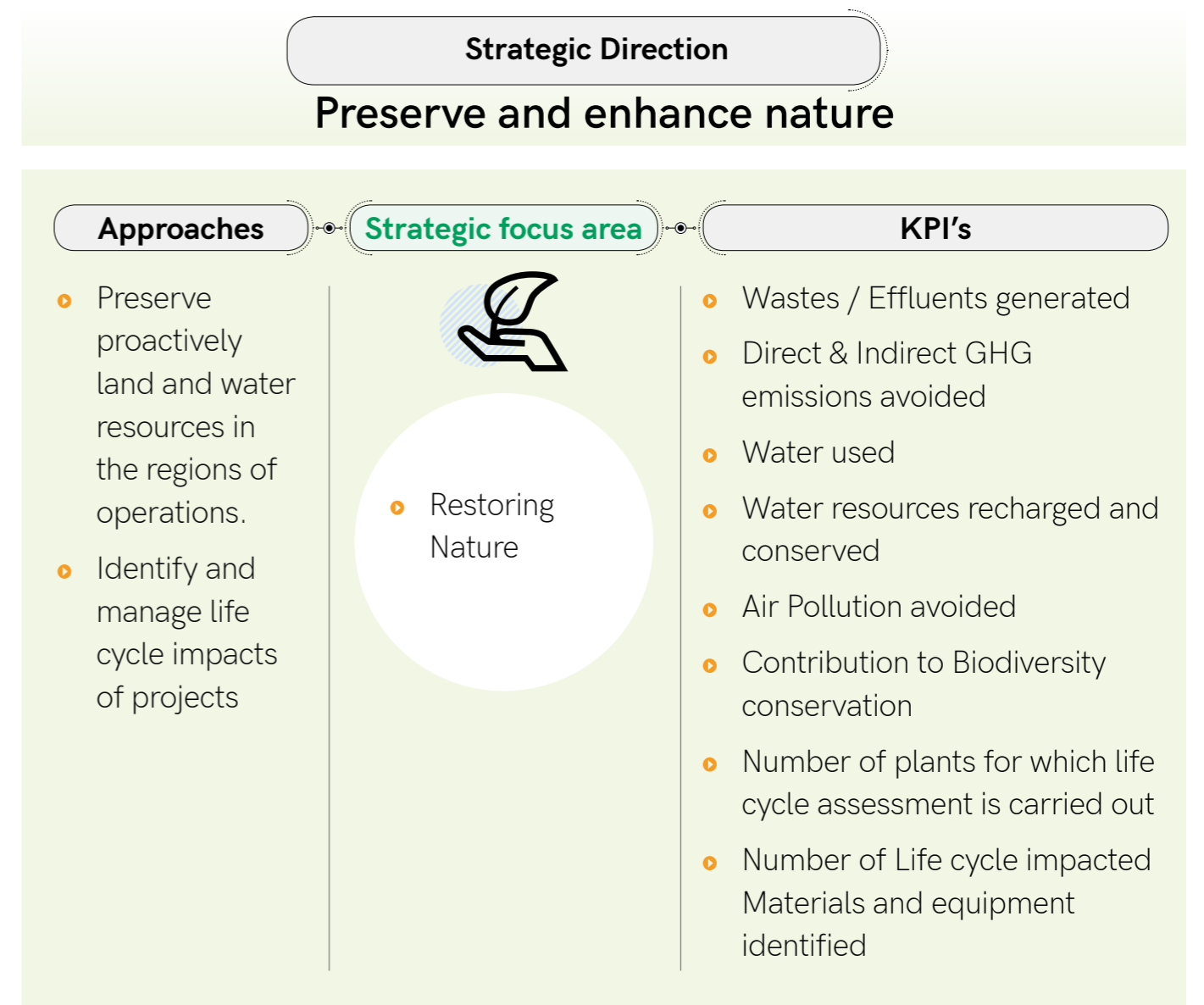
## Innovation Capital

Innovation at Greenko is continuous and targeted to adopt and adapt to appropriate technologies. It is also about system integration and geography-specific customization involving soft and hard approaches. Accordingly, innovation at Greenko is cross-functional, systems and processes and standard operating practices. **People, Process and Systems significantly supplement Greenko's Innovation Capital and becomes the critical instrument for driving transformation and adaptation at all levels.**



## Natural Capital

Greenko's business is **designed to harness unaccounted nature's value. Accordingly, Greenko's business from inception and in future, would be addressing challenges and opportunities of "caring for nature"** Greenko is committed not to harm nature in all its operations and value chain, to the extent practicable. In addition, Greenko is proactively contributing to the conservation of ecosystems and managing impact across the life cycle.



# Our Strategic Approach



## Social & Relationship Capital

Greenko’s business involves operations that are land, water and ecology intensive and is situated amongst people and has intertwined with their livelihood. It touches the lives of many in and around sites. Greenko considers the nature of its operations, as an opportunity to touch many lives and contribute. Greenko’s partnership with communities enables us to deploy projects on time, manage assets efficiently and provides us a broader social license to operate. **Further, journey to GKO 3.0 and 4.0 would necessitate partnerships and relationships of a new kind. The challenge in the new model will be “to be self-organizing in a multi-agent system”**

### Strategic Direction

## Reinforce stakeholder trust and enhancing engagement

### Approach

- Following best Governance practices to increase stakeholders trust
- Contribute Strategically in the communities to effect measurable outcomes
- Participate Actively and ethically to contribute to shaping public policy
- Delight Customers by meeting their total requirements
- Building co-creative supplier relationship

### Strategic focus area



- Stakeholder trust

### KPI's

- Percentage of time spent by the board in the oversight of strategy
- Number of Grievances received and addressed
- Number of whistles blown and addressed satisfactorily
- Community Social Investment
- Number of Beneficiaries
- Social Return on Investment for select interventions
- Community satisfaction index
- Number of hours spent by senior management contributing to public policy
- Customer satisfaction index
- Percentage of retained suppliers (beyond 3 yrs)
- Percentage Local procurement expenditure
- Number of co-creation projects with stakeholders
- Supplier satisfaction Index

# Future Ready Energy Utility

Harnessing new value pools

**Greenko envisions the decarbonization, digitalization and decentralization as an opportunity and is in the process of transforming its business models to GKO 3.0 - transforming renewable energy into reliable, schedulable, and flexible energy and GKO 4.0- Energy value chain moving closer to customers. To Greenko, it is a continued pursuit of its vision "To lead Decarbonization, Digitalization & Decentralization of India's Energy Sector".**

The digital revolution as well as renewables, distributed generation, and smart grids are triggering new business models and regulatory frameworks. The energy markets and competition for customers are shifting to the online channel. Also, the Internet of Things (IoT) driving new product and management options, with digital companies and start-ups disrupting the landscape, while governments and regulatory bodies seek to encourage smarter measuring systems and greener standards for energy generation and consumption. Besides, digitalization has offered an enormous opportunity to manage generation more efficiently and in the case of renewables, it offers options to generate reliable, schedulable, and flexible energy. To thrive amidst these challenges, the utility of the future - Greenko, will be a significantly a decarbonized and digitalized system. Accordingly, GKO 3.0 and GKO 4.0 have a focus on transforming its organization and business and lead digitalization and decentralization of

the energy system. This transformative journey will effect enhancements in productivity, reliability, safety, customer experience, compliance, and revenue management, while significantly contributing to the mitigation of climate change and socio-economic development.

In India, there is a growing preference amongst B2B customers for renewable energy with parity in cost and flexibility. Increased share of RE is pushing greater intra-day variations for baseload coal, demanding more

flexibility from RE generators. Also, it is known fact that in India there is a limited flexible generation compared to other countries. In addition, 40 GW of generation capacity based on coal in India is generating power at a cost more than Rs.4.20/kWh and RE Storage hybrid can potentially compete with such capacity. Also there are pools of value that Integrated Storage projects can tap into. In order to harness this opportunity in schedulable RE- value pools in the power sector in India, Greenko has planned for Integrated Renewable Energy Storage projects.



# Future Ready Energy Utility

## Pools of Value Creation

### Generation

- RE Smoothing
- RE Firming
- Curtailment Avoidance
- RET/RTC
- RE Arbitrage

### Transmission and Distribution

- Frequency Regulation
- Voltage Regulation
- T&D Investment Deferral
- Wholesale Arbitrage

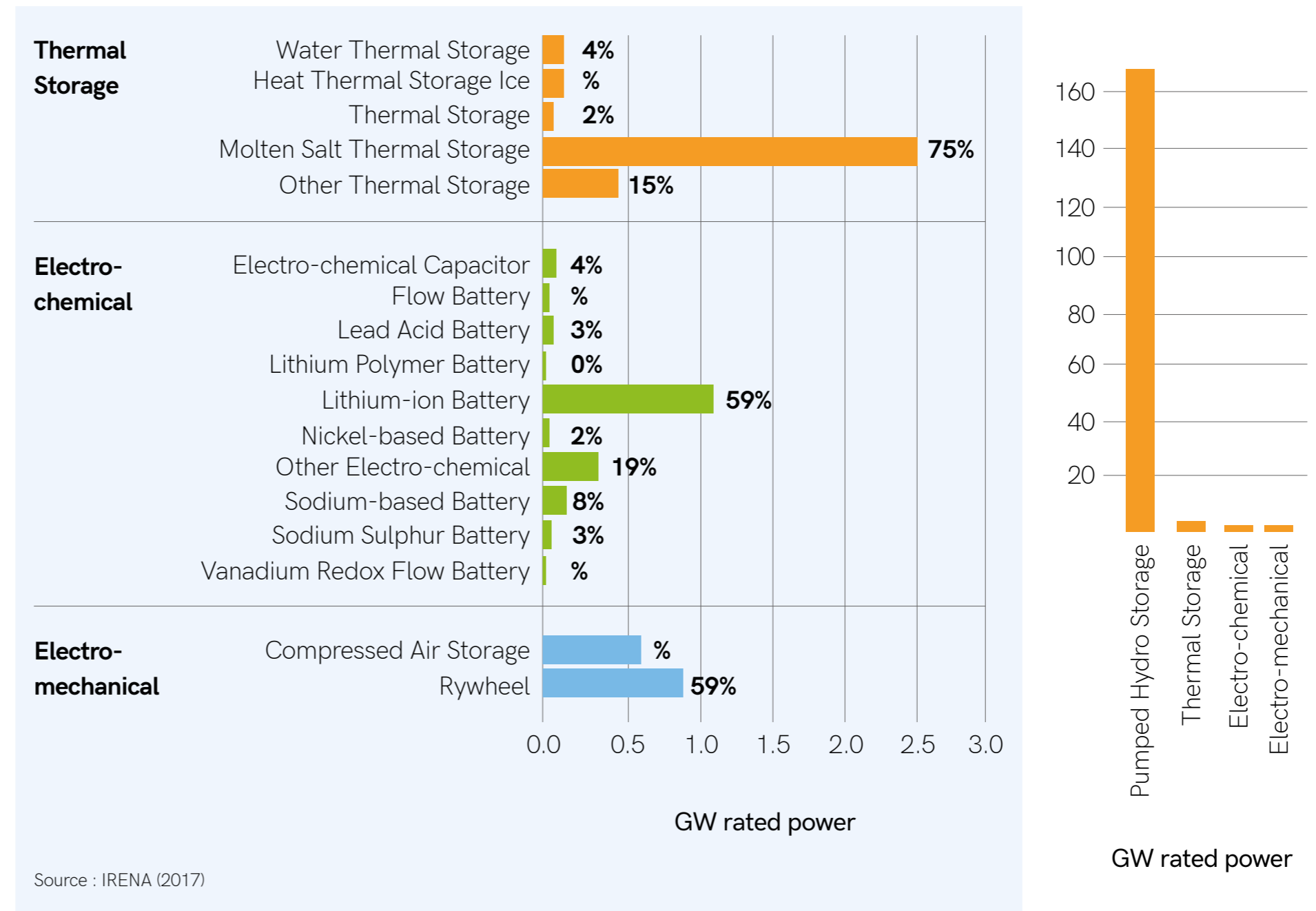
### End Consumer

- End-consumer Power Quality (e.g., Backup, UPS)
- Reliability (e.g., Residential Solar + Storage)
- Increase of Self-consumption (e.g., Residential Solar + Storage)

It is clear that schedulable renewable is the pathway for deeper decarbonization and advances in digital technologies combined with storage technologies will make it possible in India. Similar aspiration is articulated by Global Solar Alliance led by India- "One Sun, One World, One Grid".

Amongst the storage technologies, pumped hydro is more predominant, cost-effective and viable in the immediate future.

## Storage power capacity by technology, mid-2017



# Future Ready Energy Utility

Energy storage system	Energy installation cost	
	Cost (USD/kWh capacity) in 2016	Cost (USD/kWh capacity) in 2030
Pumped Hydro Storage Systems (PHSE)	17	17
Compressed Air Energy Storage systems (CAES)	53	44
Flywheel Energy Storage Systems	1,500-6,000	1,000-3,900
Li-ion battery	200-1,260	77-574
Li-ion sub technology	350-1050	145-574
Lead-acid BES systems	105-475	50-240
Flow batteries	315-1,680	108-576
NaS battery	263-735	120-330
Sodium Nickel Chloride batteries	315-490	130-200

## Storage Solutions

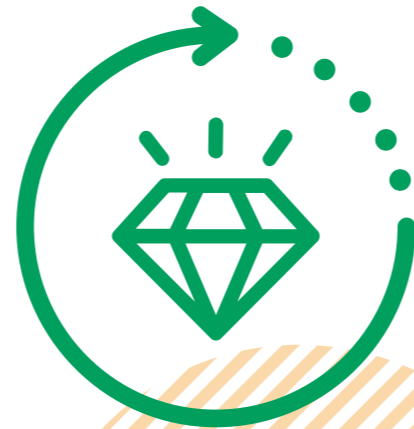
Hornsedale Power Reserve (Tesla Big Battery), South Australia - has been able to eliminate fossil fuel generators as a backup option. This Lithium-ion battery of capacity 100 MW (129 MWh storage) is estimated to have costed USD 56 million. Almost 55% of the FCAS (Frequency Control Ancillary Services) market in South Australia is now captured by Hornsdale Power Reserve and it has also led to a drop of FCAS pricing by 90%.







# G



## Creating and Sharing Value

The year 2018-19 was very vital for Greenko towards its transition to GKO 3.0. In this section of the report, we discuss our performance during the year in creating and sharing financial and non-financial value that is of paramount importance to the sustainability of our business by addressing salient concerns of our stakeholders.

As outlined in the earlier section, Greenko's strategic directions, approaches and focus areas are designed to (i) Mitigate risks and harness opportunities presented by evolving external context in the medium and long-term and (ii) Reinforce strengths and overcome weaknesses to generate and sustain value. Greenko monitors the deployment and effectiveness of actions in strategic focus areas and calibrates its focus and approach on a periodic basis. The KPI's that are tracked and reported in this section inform (i) actions taken to deploy strategy and their effectiveness and (ii) reinforcement of value creation abilities.

# Financial Capital

In the pursuit of its vision and mission, Greenko taps diverse sources of capital and pursues both organic and inorganic growth to continue to be amongst the top 3 power utilities in India. Different functions contribute to improve debt capacity and access to capital. The organization is aligned and in readiness to adopt to organic and inorganic growth.

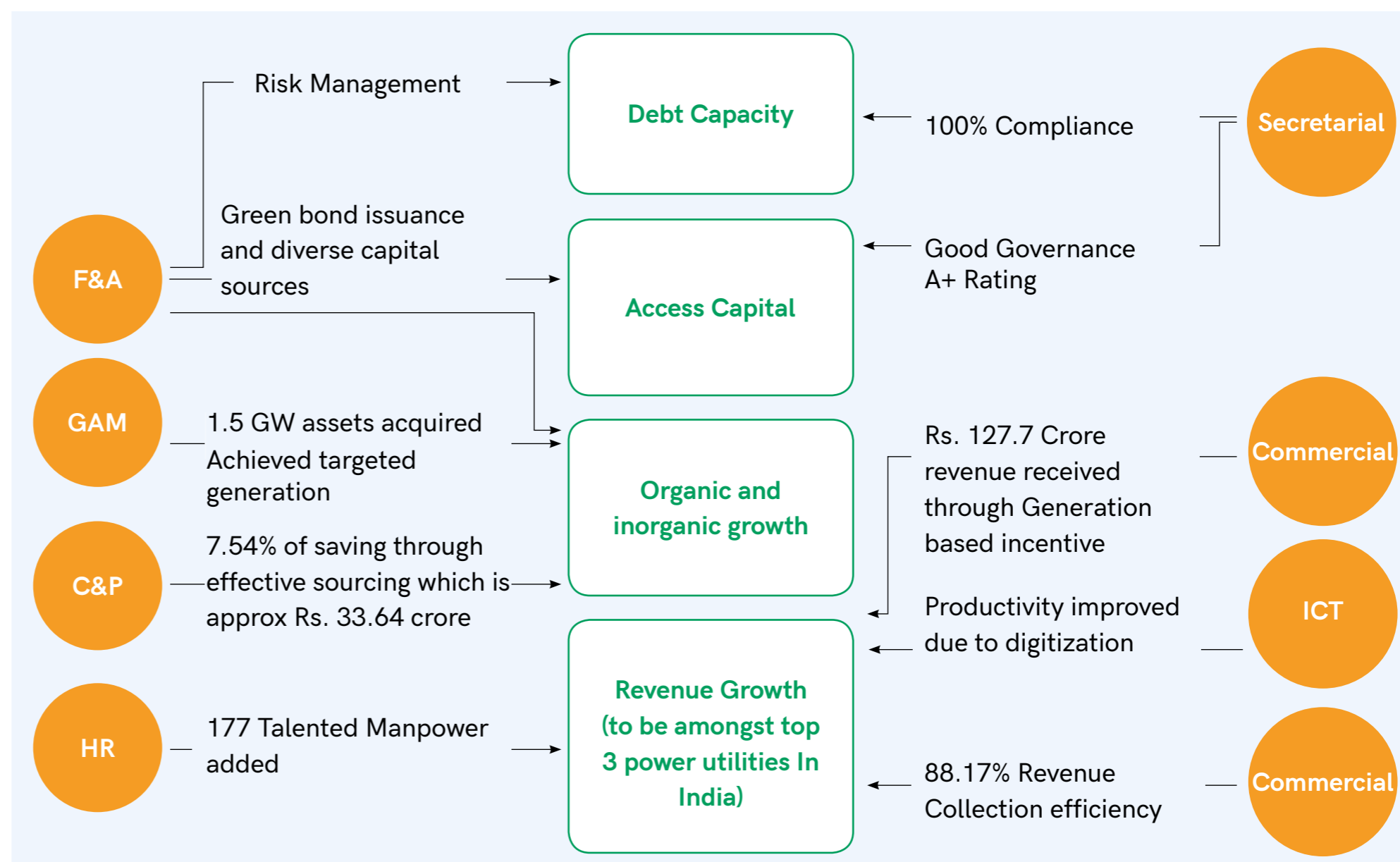
Going forward, Greenko will harness patient and responsible capital to actualize the possibility of clean, reliable and affordable energy in India.



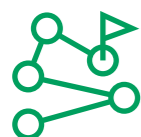
## Strategic Approach

Commitment to integrity and transparency is the cornerstone of the continuing trust enjoyed by Greenko. In the pursuit of its vision and mission, Greenko taps diverse sources of capital and pursue both organic and inorganic growth to continue to be amongst the top 3 power utilities in India.

Availability of financial capital at right cost and time is critical in the pursuit of Greenko's vision and mission. Every function and business understands the concerns and expectations of capital providers. Greenko's diligent evaluation and assessment of opportunities, partnerships and acquisitions; and risk identification, control and provisioning for residual risk illustrate our strategic approach to reinforce financial capital.



# Financial Capital



## Journey so far

Greenko has performed well on all the strategic approaches to reinforce financial capital and this is helping Greenko progress towards its ambitious goal of reaching 10GW of installed generation capacity. This will enable Greenko to offer sustained and attractive returns to shareholders and other stakeholders.

As would be evident from the performance figures given below, Greenko has maintained a good credit rating thereby remaining attractive to potential investors. It has been able to tap diverse sources of funds and has positioned itself in the top three of the renewable energy generators in India.

Greenko has a well-diversified source of revenue - diversified renewable generation technologies and diversified PPA structures, including (i) Feed-in tariffs, (ii) APPC Tariffs and (iii) Third-party direct sales.

The different generation technologies give peak generation in different seasons across the year. The diversity of PPAs and the types of customers served helps in reduction of the regulatory and payment risks and ensure continuous cash flow for the operational projects. Further, due to the different capital avenues that Greenko accesses, it is able to raise finance at competitive terms.

Moody upgraded Greenko Dutch to Ba1 and assigned for the first time Ba1 to notes issued by Greenko Solar. Similarly, Fitch Rated Greenko Solar (Mauritius)'s Proposed USD Notes First-Time 'BB-(EXP)

Greenko's green bonds are oversubscribed with bond prices 5.1% with 5 and 7 year maturities. Goldman, Blackrock, Fidelity and Manulife are amongst the investors. The proceeds would be used to refinance the debt inherited from acquisitions.

(all values in million USD)

KPI	FY-18-19	FY-17-18
Profit before taxation	85.4	50.3
Profit for the year	38.8	32.9
Earnings before interest, taxes, depreciation and amortization (EBITDA)	470.50	375.4
<b>Revenue</b>		
Total Revenue	485.1	314.3
Revenue from Wind energy projects	244.8	176.9
Revenue from Solar projects	174.7	64.9
Revenue from Hydro projects	63.3	67.4
Other operating income	0.6	0.4
GBI Revenue	17.1	11.9
REC certificates	2.2	0.4
<b>Expense</b>		
Employee benefits expense	14.9	13.9
Cost of material and power generation expenses	42.6	29.3
Other operating expenses	28.6	31.1



## Moving Ahead

Greenko would build upon stakeholder trust to pursue opportunities in the energy sector in India and make it possible to generate clean, reliable and affordable power. Besides, clean and schedulable electricity will be the new energy as the demand for oil and gas in India will flatten off much earlier to 2035. Greenko believes that investors across the globe would harness the opportunity to address deep decarbonization and digitalization of energy sector in India. Greenko would continue to (i) tap these diverse sources of responsible and patient capital and (ii) strengthen governance including risk management at all levels

GRI 201-1, 2, 3, 4

# Message from the Senior Advisor



**“Our teams are being trained to develop competency that can be deployed across businesses. As also, we are deploying our resources progressively in all clusters across India.”**

I am excited to present to you our performance against six capitals. Our pursuit to optimally use these capitals and add value to all our stakeholders.

Our Integrated Renewable Energy Projects involving pumped storage, are progressing and are likely to achieve critical milestones in the coming years. The year FY2018-19 is characterized by cost optimization in operation of existing assets and preparing for major operational transition to Integrated Renewable Energy Projects and Intelligent Energy Platform.

The focus is three dimensional:

- (i) Enhanced generation through improvement in the performance ratios,
- (ii) Optimizing dispatch of energy generated through intelligent maneuvering, and;
- (iii) Cost reduction with enhanced focus on safety, quality and reliability of our assets across the group.

Greenko, as an offshoot of its DNA, poised to set new benchmarks in RE Asset management. As we transform to become Greenko 3.0, we transcend to operational excellence through empowering/enabling our people to take ownership. This model of ownership driven employee engagement ably represents our people to be Greenko brand ambassadors, reflect a sense of purpose, improves the “fragrance of win-win” at the workplace and radiates passion.

Further, we have implemented across the organization- “Greenko Way of Doing Business”. This consists of empowering people for discipline, ethics, innovation, and teamwork and setting up processes and systems for excellence, innovation, and stakeholder inclusiveness.

From the time the Greenko is founded, it has addressed the challenges of providing clean, reliable and affordable power. Greenko continues on the same path by transforming the business model in response to disruptive changes in the energy sector scenario. We are at a confluence of many megatrends- climate change, technological advances decreasing RE generation costs and the possibility of intelligent and adaptive matching of demand and supply and socio-economic change requiring decentralization. This mélange of push and pull makes clean, reliable and affordable energy a possibility in India. Greenko is and will make every effort to play a pivotal role in achieving this.

We, at Greenko, are committed to creating new and enviable benchmarks in RE asset management. In this journey, we recognize the importance and contribution of stakeholders. This report is a part of our engagement with stakeholders and accordingly, we will be keen to receive concerns and suggestions.

**Venugopala Rao Naredla**  
Senior Advisor



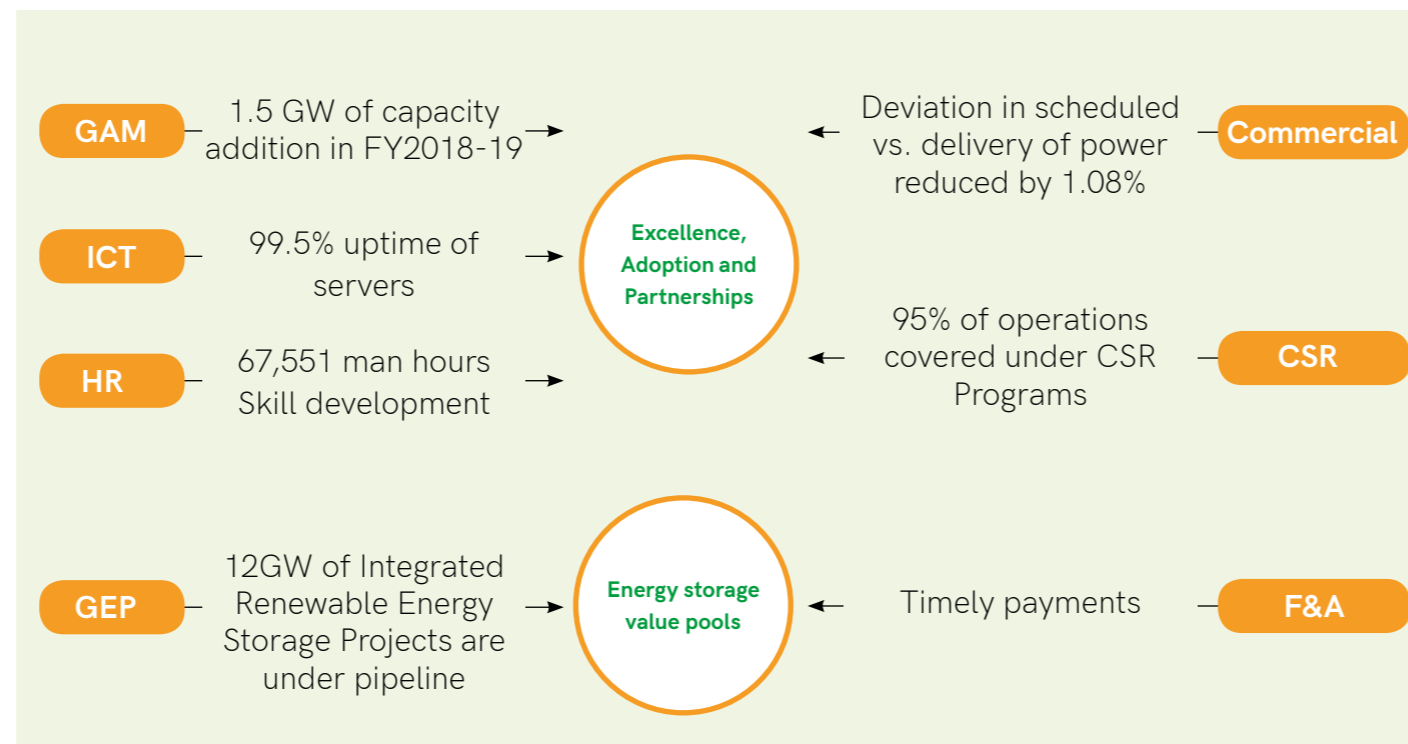
# Operational Capital



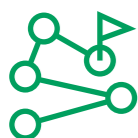
## Strategic Approach

As the percentage of renewable power generation will grow and reach above 40% of electricity generated, the grid, consumer and generator have to address qualitatively different challenges. The new value for the RE generator would be schedulable. Greenko has been preparing to harness such diverse value pools by transforming its business model. Over and above this, Greenko continues to be agile and ready to adopt the technology as per the demands of the business. This has implications for our technology, R&D, HR and Operations' functions.

To preserve and enhance value creation in operational capital, Greenko adopted two strategic approaches viz., pursuit excellence, adoption and partnerships; and harnessing energy storage value pools. All functions across Greenko contribute to deployment of these approaches. Review of performance on operational capital demonstrates Greenko's preparedness to smoothly transition to GKO 3.0. and be a 30 Billion Units electricity platform by 2023.



# Operational Capital



## Journey so far

India's commitment for deep decarbonization of the energy sector would create new value pools for power utilities. The experience and expertise of Greenko in Renewable Energy digital technologies would enable it to harness these new value pools. Greenko is (i) improving the efficiency across its operations by deploying digital technologies (ii) optimizing maintenance cost of existing assets (iii) deploying people, process and systems to standardize operational responses and (iv) developing new skills, systems and partnerships for the new initiatives in storage and intelligent energy platform. The group continues to invest in new technologies and processes to achieve operational excellence and to power transformation towards GKO 4.0.

## 1 Excellence, Adoption and Partnerships

The electricity system is becoming much more dynamic: decarbonized, decentralized and digitalized. In achieving the goal of decarbonization of the economy, renewables are already the fastest-growing technology. Digitalization further offers an opportunity for making the renewable power generation flexible. Greenko operates its business under this evolving context. Operating efficiencies and effective management of operational assets are therefore crucial to delivering desired value to all stakeholders.

Greenko's diverse operating assets are in accordance with the highest standards of performance, availability, and efficiency. The continuing excellence of our operations provides a strong foundation for the ongoing transition of our business towards a digitalized future. As is evident from the operational performance delivered during the reporting period.

The energy generation infrastructure of Greenko has demonstrated a strong track record by increasing the installed capacity to 4.8 GW through internal development and acquisitions of operational, under construction and active development projects. In FY2018-19, Greenko added 1.5 GW of capacity. The capacity added through acquisitions includes 2 projects in solar portfolio, 1 project in hydro portfolio and 13 projects in wind portfolio. The company has over 500 MW of assets under construction

which are scheduled to commission next year achieving a 5GW platform scale.

The total generation has increased by 68.1% and healthy PLF was maintained in each of the renewable energy generation technologies viz. Wind, Hydro and Solar.

KPI	Solar	Hydro	Wind
Plant Load Factor (%)	24.7	42.6	24
Machine availability (%)	99.65	99.6	98.30
Grid availability (%)	99.41	97.9	98.60
MTBF (hrs)	-	2,990	2124
Total number of equipment failures	4153	86	94
% improvement in productivity from last year	-	8.64	9.02

Generation losses/downtime losses in MU	Solar	Hydro	Wind
Loss of generation due to equipment failure	3.2	2.52	2.5
Loss of generation due to external grid failure	8.9	15.3	0.99
Loss of generation due to internal grid failure	7.6	8.47	1.014



# Operational Capital

## 2 Integrating Acquired Assets

To ensure excellence in operation and to improve the overall reliability of all plants of Greenko's orange fleet, an asset health check and monitoring program has been implemented across all 10 sites of Orange. The overall reliability of Orange Assets is improved through WTG health check and Internal feeder line inspection program.

### Actions taken

- WTG performance monitoring and Tip Speed ratio monitoring done on daily basis
- 100% audit inspections
- Thermography inspection done for Pooling Sub Station & Line jumper connections and all observations were rectified
- Internal line strengthening and generator star ring retrofit completed for specific sites as per requirement.
- Drone inspections to improve asset reliability.

### Impact

Marked improvement in machine availability by 0.3% and internal grid availability by 0.7% is the result. The generation increased by 2.0 MU compared to last year for an average wind speed of 0.26 m/sec.

## 3 Projects under Clean Development Mechanism

Greenko has registered 22 Clean Development Mechanism (CDM) projects with UNFCCC and achieved 24,26,000 CERs.

During the reporting period, 20 projects were registered under VCS and one new 200 MW project is under process for registration under Gold standard.

In addition to the Clean Development Mechanism. One solar and 3 non-solar plants were registered under REC mechanism and further registration of 4 solar plants and 2 non-solar plants under REC Mechanism is under progress.

## 4 Energy value pools

There are a variety of energy value pools that are being rewarded by the regulator and Greenko is harnessing the same.

## 7,379 MU's

Saleable electricity in Mu for FY2018-19  
(Excluding Import Energy and line losses)

## 6,514 MU's

Sale of electricity to utilities (PPA / Feed in-tariff) in Mu for FY2018-19

## 509 MU's

Sale of electricity through Wheeling and banking (direct sale to consumers] in Mu

## 356 MU's

Sale of electricity through exchanges in MU's

## Rs. 124.23 Cr

An amount of power is traded in IEX through Sneha Kinetic Power projects Pvt Ltd.

## Rs. 127.7 Cr

Revenue received through GBI (Generation Based Incentive) against the invoiced amount of Rs. 130.2 Cr.

### Sale of electricity through renewable energy certificates (REC)

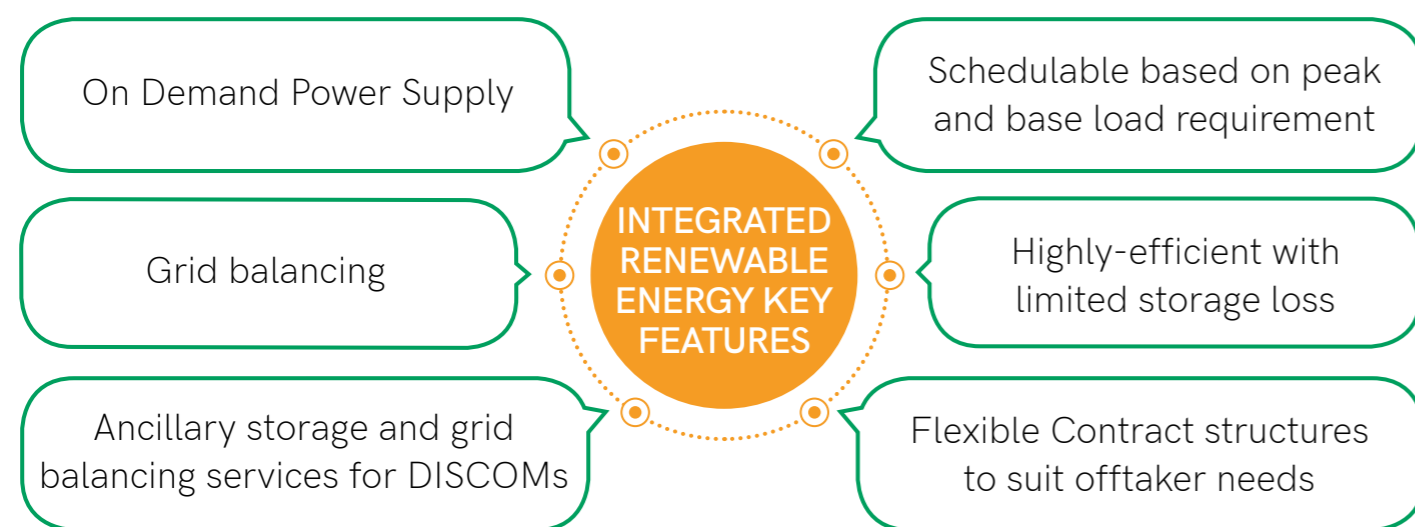
One Solar Plant and three non-Solar plants are under REC Mechanism.

Further, registration of four solar plants and two non-solar plants are under progress

# Operational Capital

## 5 IRESP

Greenko is currently developing state-of-the-art multi GW scale Integrated Renewable Energy Storage Projects "IRESP" in the states of Karnataka and Andhra Pradesh which will harness the power of solar, wind resources with digitally connected storage infrastructure to provide round the clock (RTC) power to grid.



## 6 Technology Capabilities and Partnerships

Greenko, over the last many years, has deployed systems and honed skills to operate the units efficiently. It undergoes continuous improvements, adopts state of the art technologies and acquires the best technological partners in the market to maintain excellence in operation efficiency.

## 7 Value maximization programs

Greenko has undertaken a number of value maximization initiatives. Some of the initiatives taken this year are: LED Lights at Dikchu HEP, Adopting new technology - Installation of TRCM at Weir site, Adopting digital technology -PLC Logic change to reduce start time, and Greenko Energy Project Systems.

### LED Lights at Dikchu HEP

In an effort to reduce auxiliary consumption conventional Sodium/Mercury lamps were replaced by LED lamps at Dikchu HEP. The replacement was done in the Control room, Machine hall, Generator floor, Turbine floor and Transformer cavern. The project team had to engage the employees to understand work processes and lighting requirements under various scenarios. Impact on safety due to any visibility challenges were addressed.

This initiative has reduced the auxiliary consumption of the plant significantly as also reduced maintenance cost and improved aesthetics.

Old fixture details	Quantity	New fixture details	Quantity	Energy (kWh) consumption/ year (old fixtures)	Energy (kWh) consumption/ year (new fixtures)
1*400W sodium vapour industrial wall type flood light	84 nos	Led fixture - 200W	84 nos	1,83,960	4,995
1*250W sodium vapour industrial wall type flood light	45 nos	Led fixture - 150W	45 nos	41,063	24,638
1*150W s(t), low height, integral tunnel & platform lighting luminaries with lamp	50 nos	Led fixture - 100W	50 nos	58,035	38,690
1*125w suspended/ surface mounted well glass luminaries	105 nos	Led fixture - 100W	105 nos	1,14,975	91,980
2*36 CFL mirror reflector with matt finish with commercial mirror optics luminaries with lamp	39 nos	Led fixture - 45W	39 nos	24,598	15,374
<b>Total</b>				<b>4,22,631</b>	<b>2,62,661</b>

# Operational Capital

## Adopting new technology - Installation of TRCM at Weir site - Bhilangana

During the rainy season, heavy trash coming in the river water from the catchment was getting deposited in front of Trash racks at Intake, choking the trash rack and slowly was reducing water intake into the system. Cleaning the trash rack by engaging under water divers after shutdown used to cause loss of time and reduce efficiency.

In order to address this challenge and to improve plant load, Trash Rack Cleaning Machine (TRCM) was installed which prevents chocking at intake.

With the installation of TRCM, trash cleaning / removal is faster, safer, & without major shutdown, thus minimizing the outage of units and minimizing entry of trash and foreign material into Turbines.

With reduction of stoppage time, the total generation of the plant increased. An additional 1.43 MU was generated in FY2018-19 compared to FY2017-18. Also, about Rs. 430 million was saved during the financial year owing to the initiative.



▲ Trash Rack Cleaning Machine at Swasti Power Private Limited

“  Forecasting demand and scheduling generation accordingly is essential to deliver flexible and reliable power, hence it is a significant initiative for the GKO 3.0 transformation. ”

**Seshagiri Rao N**  
Vice President - Commercial

“  Our hydroelectric power plants are performing very well. We are using efficient GOMS for our hydro asset management, which guides us in maintaining, repairing and future-proofing our infrastructure and operations. ”

**Prasada Raju J.V.S.D**  
Senior Vice President -Hydro

“  Our wind sites are remotely located with typical infrastructure and environmental challenges to manage the asset, which is regularly overcome by the asset management teams with a dedicated and committed team on the ground. We are using smart technology initiatives like condition-based maintenance on gearbox and bearings, periodical regular inspection of blades, electronic vigilant system, automated substation systems, regular audit checks makes asset in a unique asset in the zone. ”

**Bharath Kumar N**  
Vice President - Wind

“  Our solar assets have achieved many milestones with qualified & experienced O&M team, adopting state of art technology like IoT, AI & ML Platform for big data analytics ensuring long-term sustainability with ecofriendly practices and also adopting world-class safety norms. ”

**Ramprasad N**  
Associate Vice President - Solar

# Operational Capital

## Adopting digital technology -PLC Logic change to reduce start time

This initiative has been implemented in Sumez, Jogini & Bhilangana plants of Greenko. Prior to intervention, in case when units were running at full load, when 33KV lines trip then turbine units also used to trip. The next start was possible only after the machine comes to a stand still, that is to zero rpm. This Run-Down Time from 750 rpm to 0 rpm was 16 minutes. In order to reduce unit's start time and to increase machine availability, a modified PLC logic was implemented such that, after the unit trips, it will be kept at rated speed such that it is ready for re-start without waiting for run down to zero speed.

This modification has significantly reduced the unit waiting time from 16 min to 4 min.



▲ Modified PLC at Bhilangana Hydro Power plant

## Greenko Energy Project Systems

GEPS is an in-house built state of the art project monitoring system tailored for project management, QA/QC, engineering, logistics, material management, & stores. GEPS is the means of communication for drawings that can be downloaded/viewed from anywhere and any source (Tab/System) thus eliminating the need for email-based file transfer. GEPS is the first-hand information to the management, it helps to identify the criticalities of the project execution in the stipulated timeline. The system helps the company to identify the severity of the critical activities by representing each activity in different color codes (5 different colors) w.r.t to a predefined program where each color represents the stage of completion of the activity against its stipulated timeline. GEPS contains Business Intelligence System and can be accessed by the management. This facilitates tracking and monitoring to the micro-level with highlighted criticalities based on the project timeline. Another function GEPS provides in Document Management System (DMS). When drawings are uploaded with the latest revisions and tags, the tagged personnel are notified through mail. This system helps mainly in reducing the need for email-based communication thus avoiding miscommunications for site and HO teams.



## Moving ahead

To achieve the goal of reaching 30 Billion Units electricity platform by 2023, Greenko will progressively expand its asset portfolio in the coming years. Deployment of PPS will strengthen processes across operations. The focus on cost optimization through technology deployment and new partnerships for spares and maintenance will continue. Further, it will execute utility scale, schedulable renewable power generation projects that are first of its kind. This will be achieved through skill acquisition, new processes and systems and qualitatively different partnerships.



“Our project management is Realtime and agile. We are using GEPS an in-house built state of the art project monitoring system to track the progress in Realtime.”

**Ramanujam AVS**

Senior Vice President - PMC



“Our engineering and design process is robust. We have a team of highly experienced and skilled engineers who are using the latest technology tools in our design process.”

**Nanda P.M.**

Sr. Vice President - Engineering Service

# Intellectual Capital

The intellectual capital at Greenko is the key driver of sustainable growth. It includes knowledge, experience and expertise in developing and operating RE projects. All functions are motivated and prepared for contributing to Integrated Management Systems, Technology Adoption and Innovation for Differentiation. Further digitalization is deployed to make information seamlessly available for decision making, operation and maintenance, effective project management and scheduling generation to harness new value pools. Performance review of various indicators of intellectual capital point to readiness of Greenko for transitioning to build an Intelligent Energy Platform.

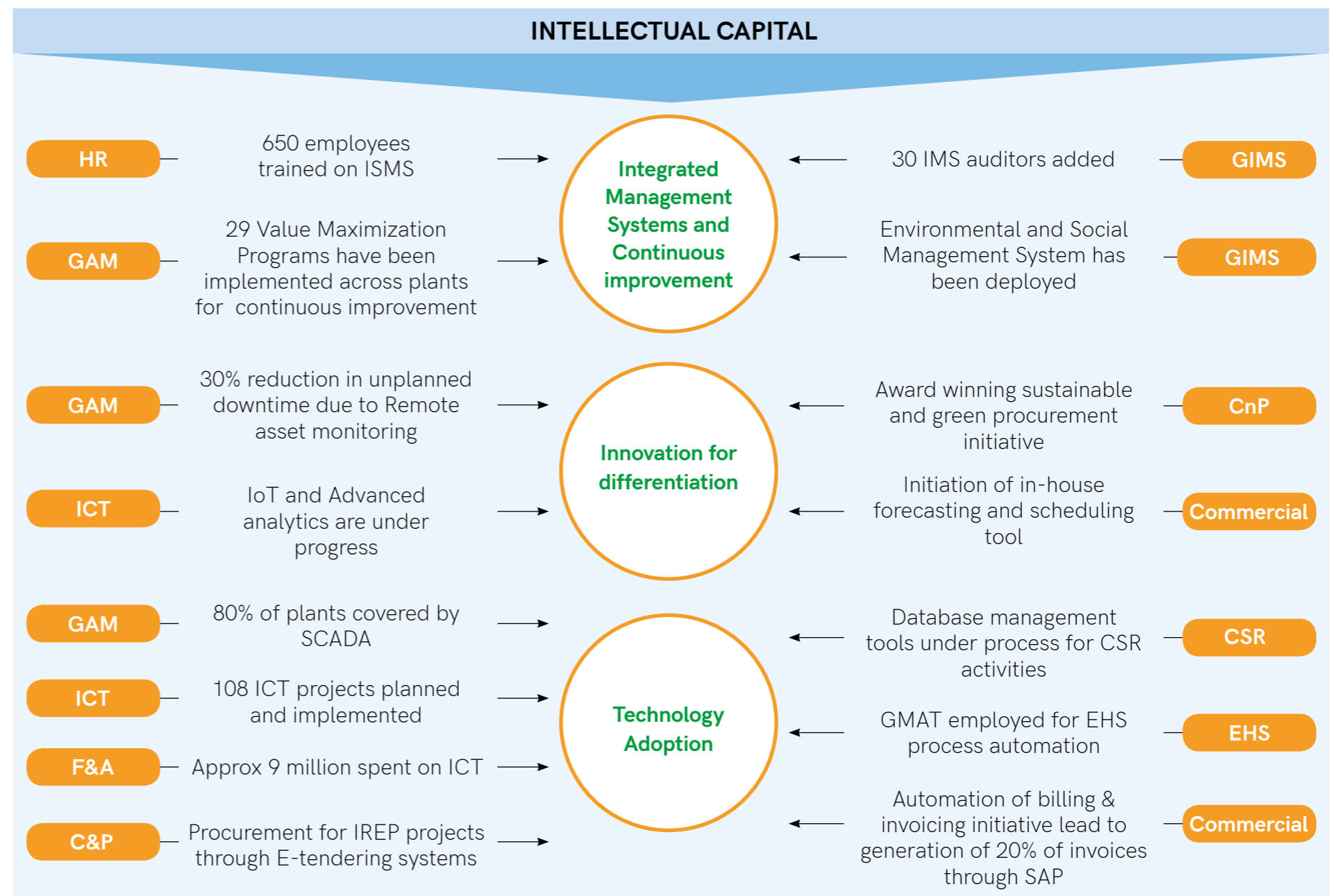


## Strategic Approach

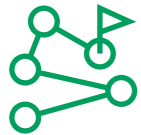
Innovation at Greenko forms the bedrock of intellectual capital. It is also about system integration and geography-specific customization involving soft and hard approaches. Intellectual Capital at Greenko is cross-functional, systems, processes and standard operating practices.



Training Session - HR



# Intellectual Capital



## Journey so far

**Digitalization is reshaping the energy industry at an unprecedented pace. To achieve the goal of reversioning energy, Greenko harnesses innovation in technology and adopts new business systems, building on the deep reserves of intellectual capital and capabilities that have powered growth over the past years.**

To become a utility-scale, flexible, round-the-clock power generator with customer-centricity, it is imperative that the company focuses on Innovation for differentiating itself from the competition, while continuing with continuous improvement in every sphere; adopting management systems; and extending standard operating practices to all activities.

Further, the recent initiatives of "Ownership at all levels" and "PPS- The GREENKO WAY" have strengthened processes and innovation.

### **1 Integrated Management Systems and Continual improvement**

Greenko's transformational journey to GKO 4.0 and its ability to deliver reliable and affordable power on a long term depends upon its ability to achieve continual improvement to adapt in the fast-growing sector, adopt

new technologies to tackle challenges and to harness diverse business opportunities and actively innovate to differentiate.

Greenko has developed and deployed Integrated management systems across its operations to standardize, achieve robust information management and sharing, monitoring and controlling systems,

forecasting and scheduling delivery, document management and surveillance.

Audits are conducted to ensure adherence and effective outcome from the deployed management systems. The IMS audits conducted are both internal and external. In the reporting period, contributing to the continual improvement, corrective actions were taken for all the audit observations.



▲ Openhouse employee engagement with JMD

# Intellectual Capital

## 2 Technology Adoption

Beside the adoption of advanced generation technology, Greenko focuses on Information and Communication Technology (ICT) to improve operational efficiencies. The main objectives of Greenko's ICT are as follows

- Create new information management and analysis capabilities to assess risk in support of the Greenko's supervisory responsibilities.
- Ensure continuous availability of data / connectivity to various plant locations for real-time monitoring of assets
- Improve information security and privacy protections against cyber threats and data breaches
- Improve service delivery and timely response to new business requirements along with building new capabilities to serve long-term institutional improvements.

GRI 418-1

“  Our logistics planning is more than on-time delivery of the right material. We used technology and creative solutions in our projects for maximizing supply chain efficiencies. ”

**Mohiddin S K**  
Senior Vice President - CMM/Procurement

In the reporting period, 108 ICT projects were planned and implemented which constitutes 16 GOMS projects, 11 SCADA projects and 81 SAP projects. ICT infrastructure of Greenko is continuously upgraded. In the reporting period, 85 networking towers, 789 CC TV cameras were installed. A total 1,424 of Greenko's employees are email users and 30 Terabyte worth data is stored. Further IT security level is upgraded to Level 2: Proactive



“  In the face of basic infirmity in the underlying core generation technologies, integrating renewable energy sources with appropriate storages to provide firm power constituted our innovation pursuit for differentiation and competitive advantage. ”

**Thirumala Raju Mandapati**  
Associate Vice President - ICT Services

### ICT Performance

**108**  
Number of ICT projects

**8.5**  
Employee Satisfaction Level

**95%**  
Reduction in equipment failures compared to last year

**99.5%**  
Uptime of servers

**10%**  
Of Performance Increment in the last two years from acquired assets

**29 Min**  
Average time taken to resolve tickets

**650**  
Number of employees trained on ISMS

**Level 2: Proactive**  
Maturity level of Cyber security

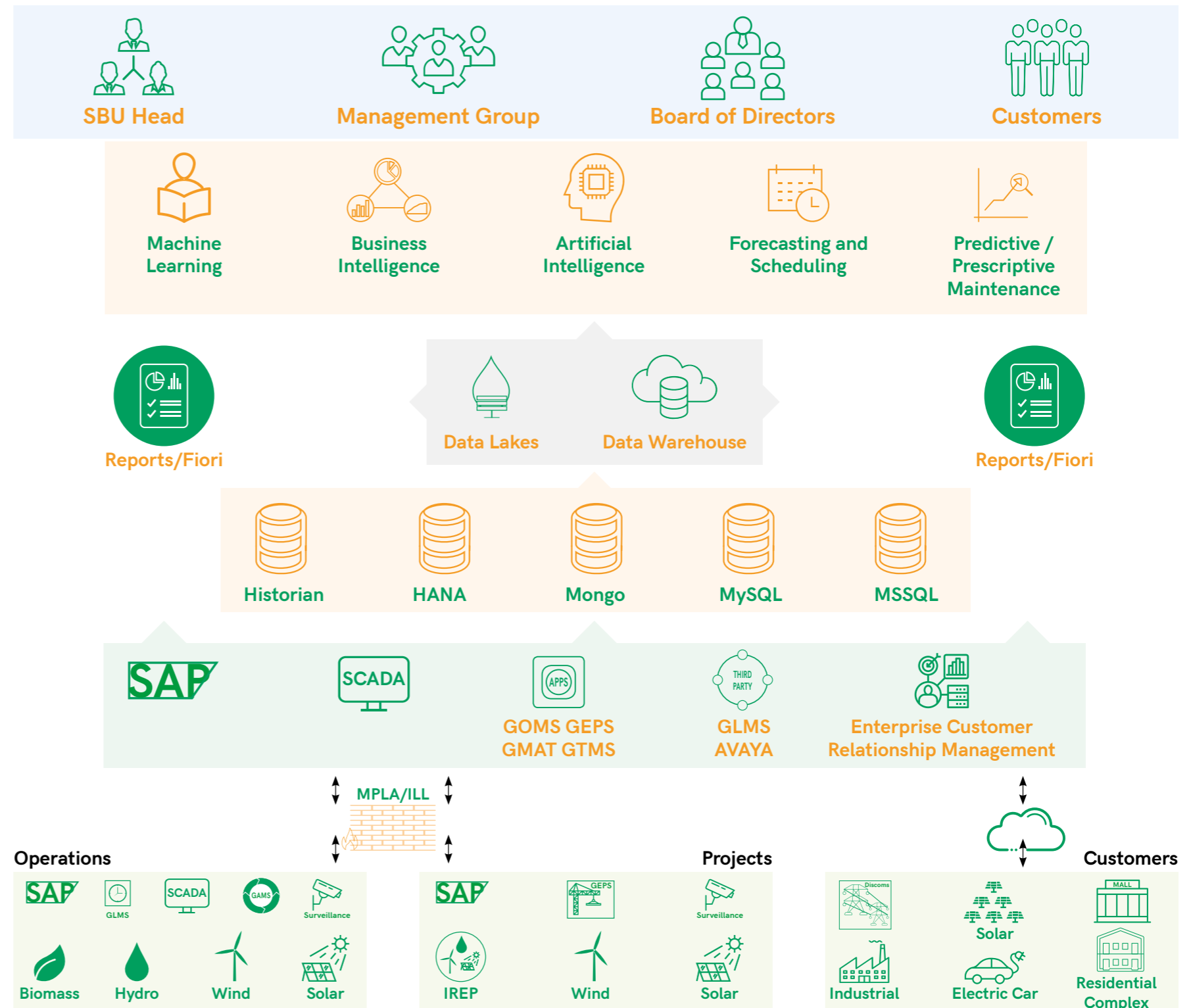
**11,929**  
Total Number of ICT tickets received and resolved

**110**  
Number of sites covered under vulnerability assessment

# Intellectual Capital

Greenko adopts new technologies, tools and instruments to achieve excellence in project management, plant operation and maintenance. Greenko plants are automated and the assets are monitored using IoT based state-of-the-art SCADA which enables centralized control and real-time monitoring of assets and troubleshooting. Bi-hourly monitoring of remote assets has been established which significantly reduces unplanned downtimes.

KPI	Solar	Hydro	Wind
Percentage of GAM processes automated	40%	44%	100%
Percentage of plants covered under GOMs	100%	52%	100%
Percentage of plants covered under Forecasting and scheduling	100%	13%	100%
Percentage of plants covered under Telemetry	100%	22%	100%
Percentage of plants covered under Historian	100%	39%	100%
Percentage of plants covered under IOT	80%	4.35%	100%
Percentage of plants covered under SCADA	100%	39%	100%
Percentage of plants covered under SAP MM	50%	100%	44% (13 nos of Acquired sites were not covered)
Number of plants covered under drone usage	15	1	10
Percentage of plants covered under DMS	90%	90%	95%





# Intellectual Capital

## 3 Processes and Systems deployed across Greenko

### Enterprise Information Management System

#### SAP S4/HANA

- Material Management
- Finance & Controlling
- Plant Maintenance
- HDM & Payroll
- S & D
- HANA Migration
- GLMS (Greenko Leave Management System)

#### SAP Success Factors

- Employee Central
- Recruitment
- Learning Management
- Succession Planning & Goal Management
- Succession Planning & Career Development
- Compensation Management

### Project Management

#### GEPS (Greenko Energy Project System)

- Project WBS planning, activity scheduling, resource allocation & track issues.
- Project progress updates by field execution & quality team using mobile apps.
- Logistics planning and track equipment delivery to Project sites.
- Business Analytics using Sisense: Real-Time project progress Insights to the project stakeholders for decision support.

### Forecast & Scheduling

- Microsoft SQL Server Integration & Reporting Services provide Asset operational reports on continuous basis for energy forecasting

### Centralized Monitoring & Control Systems (SCADA)

#### GE Proficy: Cimplicity 9, Historian 6.1

- Integration and visibility of all plants data at GAMS command center. Real-time monitoring of Plant parameters by O&M. Reports and Analytics for performance improvement.
- GOMS- field services operations and maintenance system

### ICT Support Apps

#### Helpdesk

- ITIL based helpdesk for incident, change & asset management
- Network monitoring, applications availability & information security AVAYA IP Office
- Internal voice communication and conference bridges across stakeholders.

### Surveillance

#### Mind Tree Gladius

- Real-time asset monitoring through networked cameras across lle group
- Assessing, Analysing and storing surveillance data for Security Services use.

### Document Management

- Document control mechanism for Plant engineering, design documents, data storage and department procedures across plants and offices.

### Resource Assessment Applications

#### Meteodyn, Meteopole, OpenWind, Wind Farmer, WAsP

- Wind Resource assessment software (s) for validating the wind data, Power Curve, identity & selecting wind farms, optimizing the Implementation strategy, validating OEM data trends and wind forecasting.

#### PVSyst

- Irradiance study, sizing, simulation and data analysis of Solar PV projects

### Collaboration Applications

#### GMAT (Greenko Meeting & Action Tracker)

- Plan and conduct business meetings, share meeting minutes, track action Items unto closure. Greenko Intranet
- Social platform to engage employee affiliation to and within the Company, Training Program, Induction programs, Shared Services



▲ SAP Training for Employees

# Intellectual Capital

## 4 Value Maximization Programs

Continuous improvement initiatives, value maximization programs and cost optimization programs were actively carried out among several Greenko projects.

### Continuous improvement initiatives

1. Upgradation of automation – Budhil SCADA
2. Localization of Tracker material
3. Initiatives for maximization of energy across wind farms
4. IoT (Internet of Things) Implementation at upper Joiner
5. Plant efficiency Improvement and Water Conservation through MOCE
6. Forecasting and Scheduling



▲ SCADA Room at Budhil HEP

### Upgradation of automation – Budhil SCADA

Budhil units were not operating at full overload due to non-commissioned systems, commissioned but non-functioning systems, lack of proper instrumentation and SCADA.

#### The following actions were taken as a part of this initiative

- Old Version NARI SCADA EC 2000 replaced with the new version IMC- 2017
- Commissioning of online Vibration Monitoring System & integration with SCADA
- Plant Auxiliaries automation: Auto operation of Plant auxiliary, UATs, SAT, LTAC breakers, DG Set, HP & LP Compressors, Drainage Pumps, Cooling water pumps & Booster Pumps
- Integration of Plant auxiliaries PLC with main SCADA
- Adding two Data Servers and a dedicated OPC server to the new SCADA system

#### Following modifications were done at the plant level:

- Addition of flow sensors on water pipelines for feedback
- Modification of the starter panels of Pumps and Compressors for making them compatible for REMOTE AUTO MODE and feedback

- LT and HT switchgear Automation to avoid the manual operation and restoration in blackout condition
- Modifications in operations logic of auxiliary systems which eliminates human error and manual operations

#### The outcome of these upgradation of Automation are:

- Ability to overload the machines up to 9%. (Approx. additional generation 8MU)
- Increase unit capacity as forced outage due to incorrect operation of the equipment is reduced
- Automation of Cooling Pumps and Booster Pumps helps efficient cooling of units and avoidance of unnecessary tripping owing to the feedback system.
- Automation of LT switchgear avoids the restoration of supply in case of Blackout and eliminates the scope of human error in manual changeover

Further, automation of drainage system helped to reduce the failure of pumps and eliminated the scope of human error in the operation of pumps

# Intellectual Capital

## Localization of Tracker material

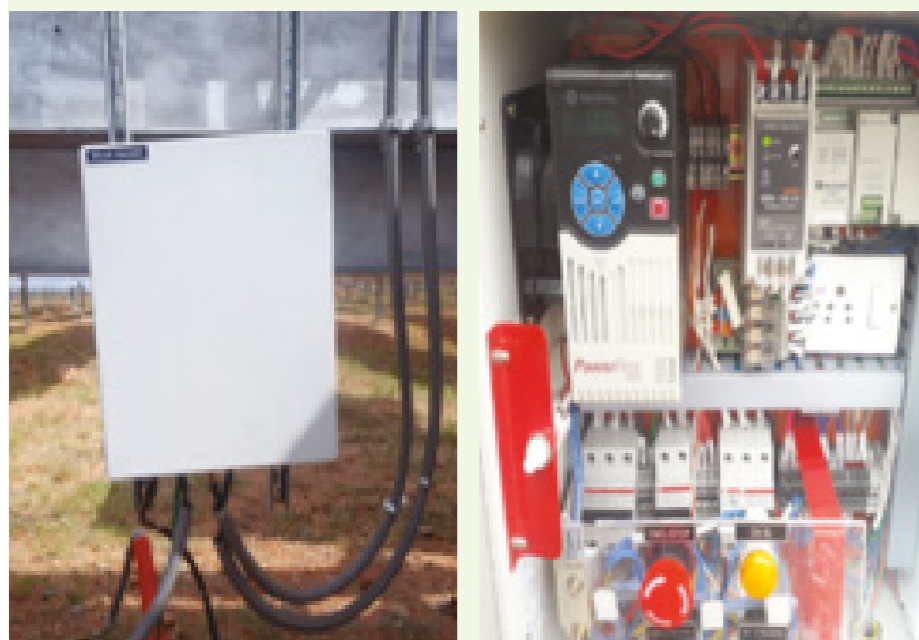
For Acquired tracker assets, overseas based OEM was not ready to supply individual parts. The mechanical components have been localized with competent vendors. Replacement of spares with new localized components across fleet.

### Impact:

Localized the spares for 1,000 No.s trackers across fleet which helped increase in Plant uptime and generation.

### Result:

**Localized the tracker controller** with customized algorithm which increased the uptime and generation.



▲ New controllers for radiation tracker system

## Initiatives for maximization of energy across wind farms

**GAM wind implemented following initiatives in ensuring maximisation of energy.**

In house WTG O&M activity has improved overall asset performance.

Preventive and condition-based maintenance practices through diagnostic tools has improved overall asset availability.

Transmission losses are minimized by adopting seasonal operational controls over wind farms.

Internal grid strengthening measures has improved overall wind farm availability.

Implemented additional safe measures in power panels to eliminate operational hazards like flash overs.

Overall wind farm blade reliability has been improved through proactive blade inspections and initiating corrective measures for anomalies on blades.

Adhering to 100% periodical and regular audit inspections has resulted improvement in overall asset availability.

Additional Leading-edge protection and Hydro wash for Blades has improved generation.

Effective IGBT maintenance management reduced component failures.

### Impact:

Enhancement of overall asset availability and performance

Overall asset health has been improved.

### Result:

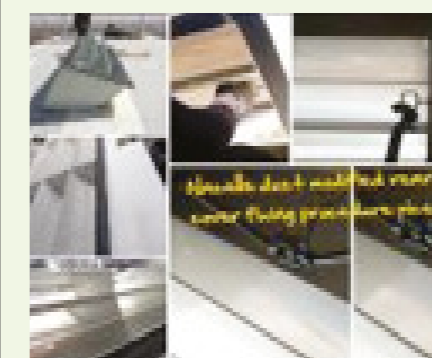
- Gross generation was improved by **4%**
- MA & GA was improved by **0.5%**



▲ Generator alignment



▲ WTG ACB Maintenance



▲ DM for Nacelle Temperature



▲ Blade drone inspection

# Intellectual Capital

## IOT (Internet of Things) Implementation at upper Joiner

There was no "data connectivity facility at Upper Joiner". IoT was implemented to transfer data to Corporate office - CMCS.

### Features of IoT:

1. Industrial IoT Gateways for Monitoring Turbine, Generator, Governor & Exciter, Transformer & HT Panels, OPU & Neutral Grounding Panels, Temp Scanners & Discharge/flow sensors etc., - at configurable intervals.

2. Local Controls and Automation of Plant Start & Stop Sequences.

3. Monitoring Software running on Local Server in the Plant Control Room and Remote Server at Greenko headquarters or in Cloud, with SQL database and long term storage.

4. User access through browser based dashboards with alerts (on equipment or system faults & errors), Analytics and **configurable reports** in Excel format.

## Plant efficiency Improvement and Water Conservation through MOCE

As a measure to improve plant efficiency as well as to reduce water consumption during module cleaning, an optimized module cleaning strategy was implemented employing the MOCE method at Ghani Solar Park, Kurnool.

### Action taken

The optimal module cleaning cycle was determined using real-time data with respect to high yield loss inverters.

### Impact:

The implementation effectively improved generation by 2.5% and reduced water consumption by 25%.

The objective of the program was to develop an in-house scientific approach for calculating the Soiling Rate of solar modules using SCADA's real-time data so as to determine an optimal cycle time for cleaning of the module, thus increasing the plant's efficiency and reducing water consumption.

## Digital inspection of rotor blades

Digital inspection of rotor blades using Drone integrated high-resolution camera is an advanced technique for reliability improvement. It is an effective alternative to have a closer look of the rotor blades. It is more reliable, cost-effective, faster to assess and has technological leverage over the traditional approach.

Using this technique, Greenko could avoid the accumulation of dirt on turbine blades which otherwise, leads to erosion and 3M tape damages. These interventions have increased the AEP from 3 to 5%.

Turbine blades' health was analyzed, as a pilot, using drone system. The images were systematically reviewed and appropriate measures were taken. Seven WTG's 3M tape blade application activity has been carried out during the reporting period. For dirt accumulated blades, corrective actions were carried out by employing a pressurized water pump.

The digital inspection of rotor blades increased performance of up to 5%. It also improved the aero efficiency of the turbine blades significantly.

# Intellectual Capital

## Forecasting and Scheduling

Forecasting demand and scheduling generation accordingly is essential to deliver flexible and reliable power, hence it is a significant initiative for the GKO 3.0 transformation. In order to meet the SLDC regulations Greenko has initiated in-house capabilities of resources and Infrastructure for forecasting and scheduling. Presently, F&S schedules are generated with the help of different forecasting agencies to deliver the SLDC's requirements. We have partnered with three of the best forecasting agencies. Further at Budhil Hydro Power Greenko could achieve a reduction in deviation by 1.08%. The deviation was less than 4% in the schedule and the actual delivery of power in FY2018-19 increased by 5.08% in comparison to FY2017-18

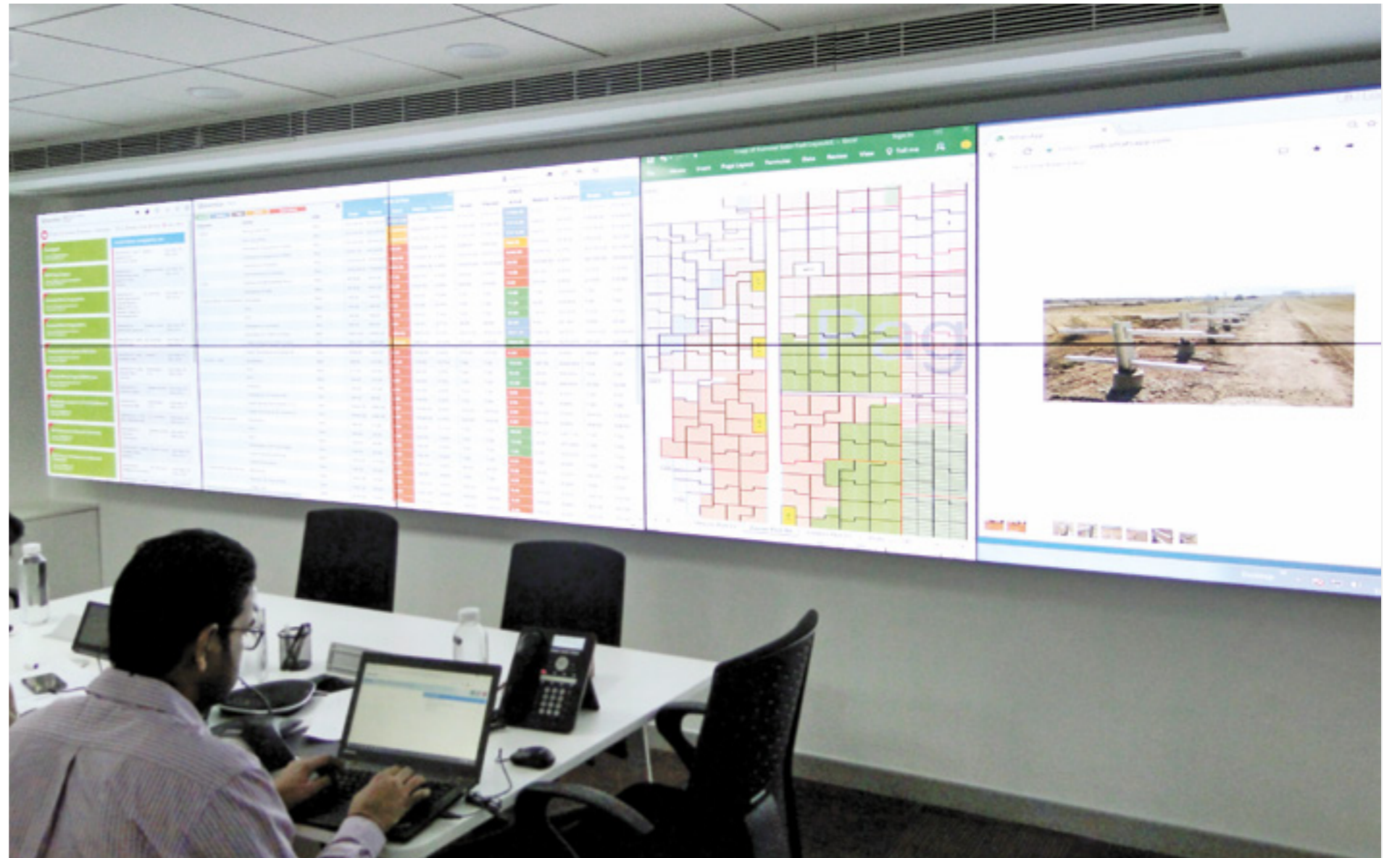
Our efforts and deployment of technology has yielded encouraging results in delivering power as scheduled. This capability is indicative and forerunner to the business transformation designed to harness many new value pools in the energy sector.

	Solar	Hydro	Wind
% variation in energy delivered to scheduled	2.7%	4%	2%

## 5 Innovation for differentiation

In the face of basic infirmity in the underlying core generation technologies, integrating renewable energy sources with appropriate storages to provide firm power constituted our innovation pursuit for differentiation and competitive advantage. Such innovation included

continuous improvements, marginal innovations, adoption of technologies and planning new and innovative projects. While Greenko makes big moves to address the challenges of future energy scenarios, it recognizes the significance and encourages the innovation culture. Greenko rewards innovation at all levels through a variety of innovation awards.



▲ Realtime project monitoring & Control at Admin Office

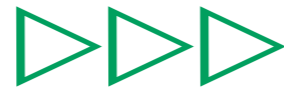
# Intellectual Capital

## 6 Information security

Information Security is imperative as digitalization is increasingly adopted by Greenko. Also, as it moves towards the Intelligent Energy Platform, information security will be more critical.

The scope of information security system extends to all information used at Greenko Group, in all formats, regardless of the specific departments and individuals that own and manage the information at a local level. This includes information owned or processed by other organizations but relevant in their dealings with Greenko Group. While the focus of information security capabilities is provided by the Information Security function, a number of additional departments including Legal and Registry include explicit information responsibilities and are therefore considered in Information security.

The Information Security function provides and coordinates expertise to influence the information security approach of the Greenko Group, helping it to achieve its strategic objectives by ensuring the availability, confidentiality and integrity of its information. By recognizing the different types of information used, and the business requirements associated with each, we will deliver a secure framework within which we can provide flexibility to suit organizational needs while maintaining compliance with legal obligations and sector-specific best practice.



## Moving ahead

All operations at Greenko will be covered by PPS and this will supplement the GIMS and other certified management systems. The empowerment model to strengthen human capital will also add to intellectual capital. Further, digitalization of all Greenko projects to provide flexible, reliable and affordable power will be pursued progressively by increasing the percentage of its projects covered by automation, forecasting and scheduling, SAP, IOT etc.

Progressive implementation of Intelligent Energy Platform by piecing together existing digital advances on an adaptive and intelligent framework will be focus of our journey ahead.



# Intellectual Capital

Value Creation is embedded in all the initiatives of Greenko. This embedding is through Intellectual capital.

Value Identification



Value Preservation



Value Enhancement



Value Creation

Develop and Manage Capitals

Tapping Diverse Sources of Capitals & Investments.

Greenko Way

Value Creation process

- Value Integrated Training approach
- Grievance redressal mechanism
- Talent Management
- Performance Management System
- Compliance system

- International Financial Reporting Standards (IFRS)
- Generally Accepted Accounting Principles (GAPP)
- Enterprise risk management

- Greenko Integrated Management System
- People, Process and System (PPS) audits
- Institutionalizing SEED IT value system and link to KRAs and KPIs
- Greenko technology platforms using Data analytics
- Agile Project management (Concept to commissioning) (C 2 C)
- Sustainable Procurement process through life cycle approach

Integrated reporting system: Framework adapted from IIRC, Setting strategic Goals, Objectives and KPIs for business and functions.

# Human Capital

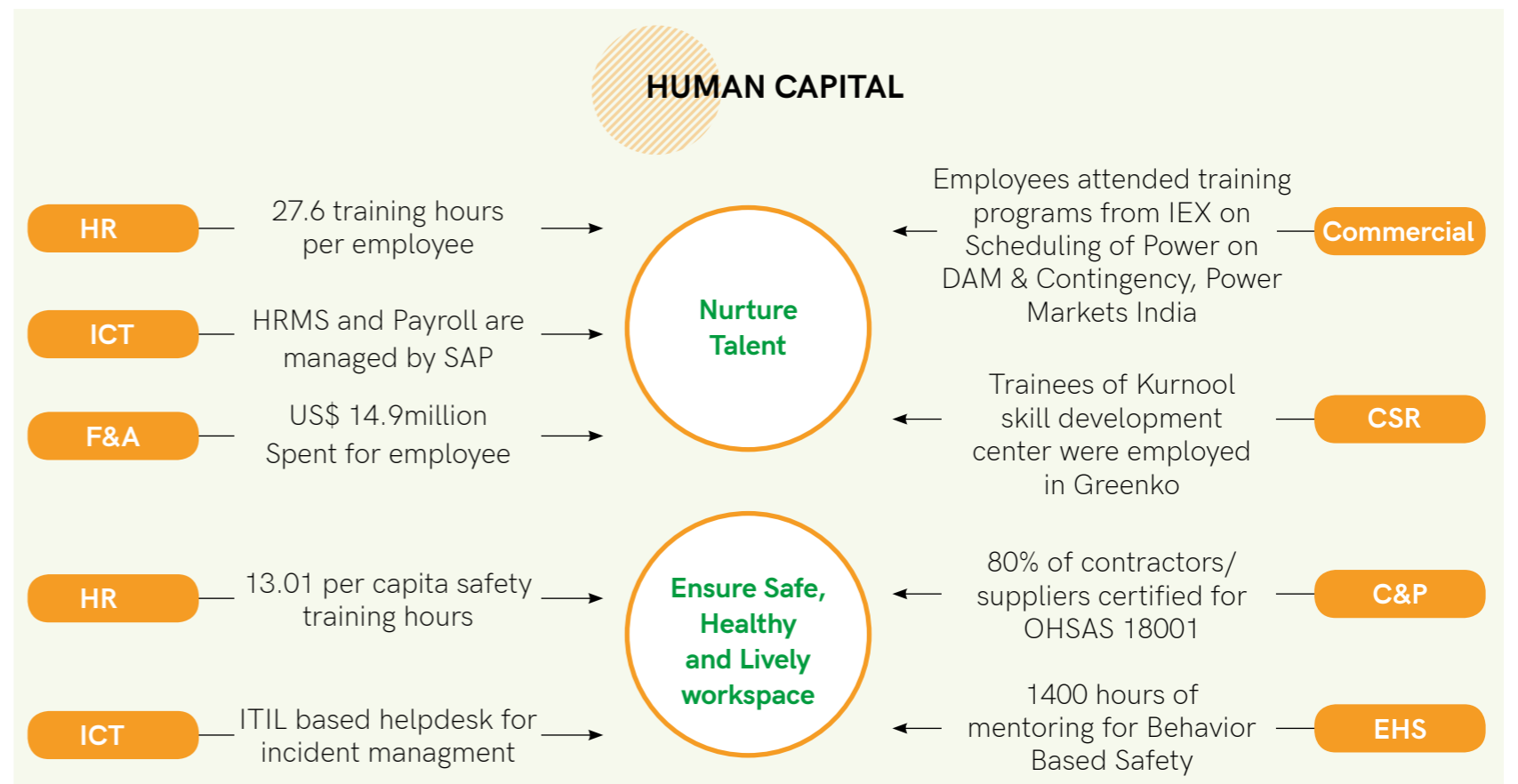
Nurturing the talent and caring for people is a principled commitment at Greenko- it involves attracting, training, rewarding, recognizing and growing. Fair, Safe, Healthy and Lively workplace is part of this commitment. People are motivated, committed, agile and innovative to enable the group to navigate through turbulent trends and harness opportunities. Greenko has adopted ownership environment complementing the accountability management system. Functional teams across the group contribute to strategic approaches to nurture talent and build safe, healthy and lively workspace. Domain & Intellectual development of the Human Capital is evident from training & development interventions which has helped for retention & employee engagement, Succession through Diversity, Health & Safety are continually improving. Innovation and motivation are improving with a culture that has been built for Ownership Mindset.

Greenko aims to continue equipping its human capital by attracting, training and retaining Multiple Competency expertise of the employees. It plans on improving its diversity by constantly building a work environment that provides equal opportunities to all gender and ethnic groups. Greenko's safe, healthy and inclusive work environment will be maintained and continuously improved.



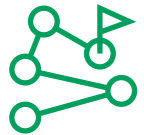
## Strategic Approach

People are at the heart of Greenko's pursuits. Nurturing the talent and caring for people is a principle commitment at Greenko- it involves attracting, training, rewarding, recognizing and growing. Fair, Safe, Healthy and Lively workplace only strengthening such commitment. As the sector is likely to face significant disruptions and challenges, "All set" with loads of motivation, commitment, agility and innovative to sail through any challenges. We have made efforts to adopt Ownership Environment complementing the Accountability Management System.





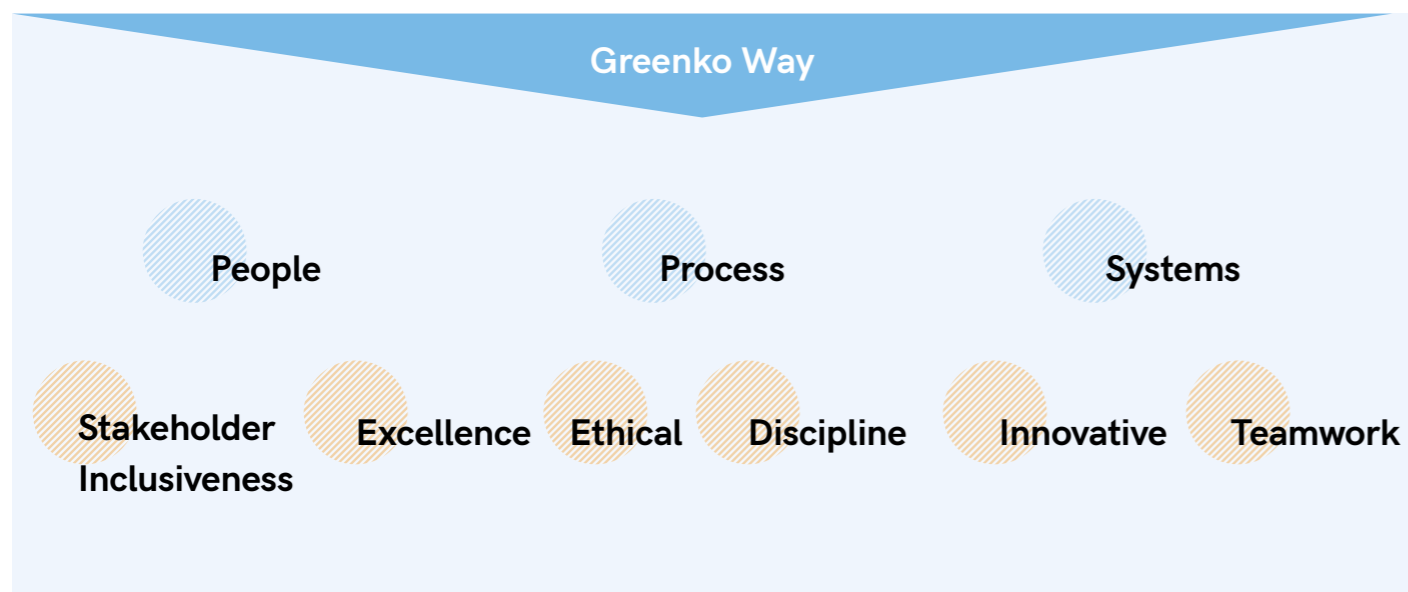
# Human Capital



## Journey so far

People are the bedrock of Greenko’s pursuits. The Human capital of Greenko with the multifaceted competencies and expertise is the asset that spearheads the growth of the group into next league of “Decentralization GKO 4.0” from the current objective of “Digitalization GKO 3.0”, also adding tangible measurable value to all the Stakeholders.

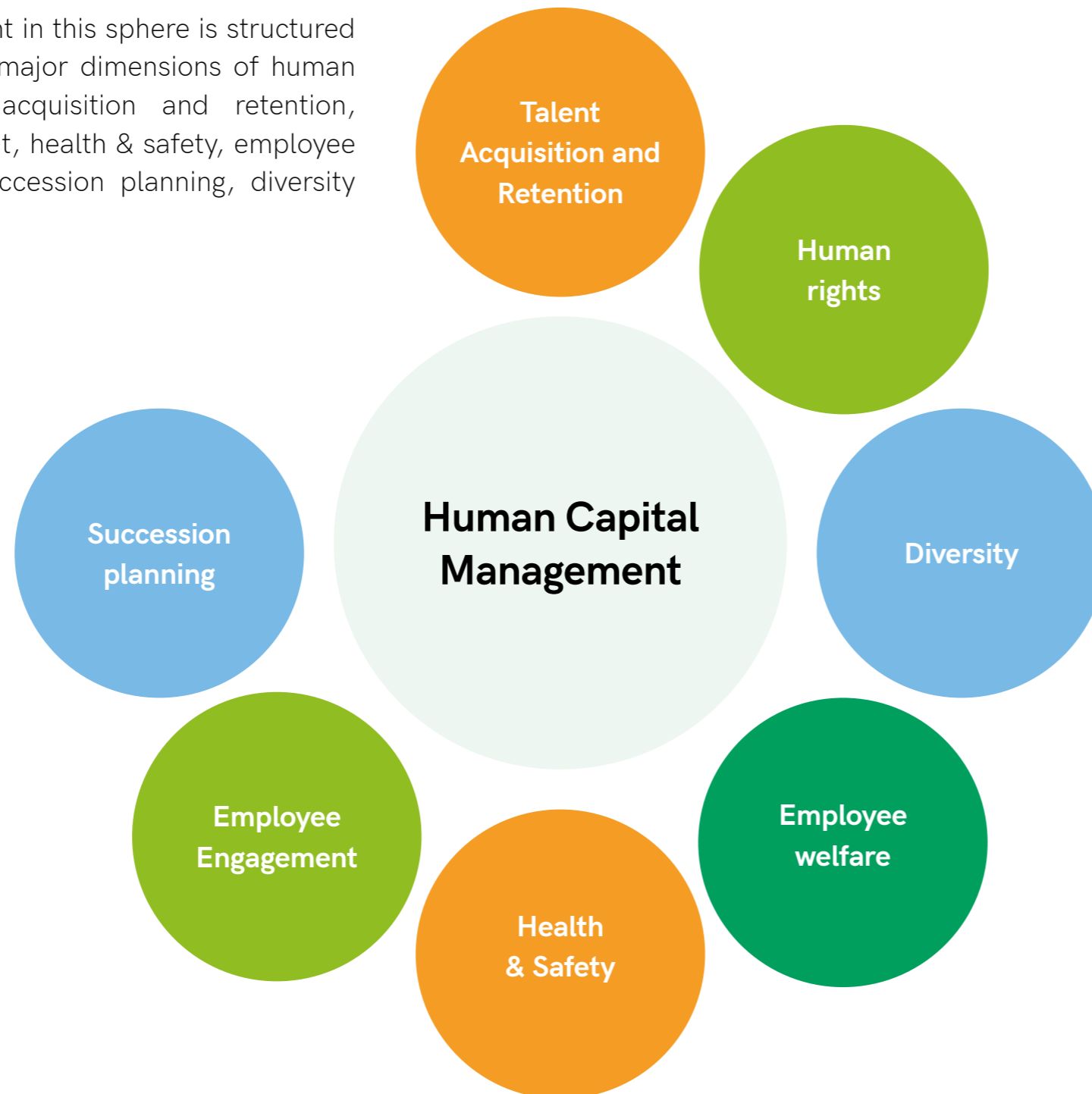
As Greenko transforms to GKO 3.0 and 4.0, it is imperative that people are motivated, committed, agile and innovative to enable the company to navigate to harness diverse opportunities. Greenko’s recent mission “Creating Ownership Environment” and PPS-in keeping with its values-SEEDIT, has yielded significant improvement in employees contribution to business outcomes and innovation



# Human Capital

## 1 Nurture and realize human potential

Greenko's engagement in this sphere is structured to impact the seven major dimensions of human capital viz. talent acquisition and retention, employee engagement, health & safety, employee welfare, diversity, succession planning, diversity and human rights.



For excellence in business performance, it is imperative that the teams are made up of well trained, highly skilled and empowered people.

Greenko focusses not only on hiring the right people but also on the other factors such as retaining talent and ensuring capability enhancements of existing talent among others. This highlights the need for effective human resource planning and management.

Greenko is the preferred brand for job seekers and the Talent Acquisition team has no dearth for potential job seekers and resume database. Due to the culture and employment practices of Greenko, it has attracted and continues to attract good talent. Employee welfare, annual performance review with due recognition for the meritorious performers and rewarding top performers across the group companies with incentives / ex-gratia has always built and sustained good reputation amongst the employees. This has supported employee retention by over 90% since inception and a retention of 93% for the FY2018-19.

During the reporting period, Greenko has successfully had a Talent Acquisition of 328 new hires across all level and grades. Greenko believes in attracting young talent, owing to which 20% of the total recruitment was filled by Graduate Engineering Trainees through campus hiring.

# Human Capital

## Learning and Development

In today's business environment, Organizations' - need to be resilient, adaptive, customer-centric and agile in order to succeed.

Three broad trends of learning are evident at Greenko:

- L&D is development centric customized to business needs.
- Employee focused development interventions.
- Comprehensive learning model with a mix of classroom, On the Job training, Workshops, Case Studies and online learning platforms.

Learning & Development programs at Greenko are designed to support continuous learning, motivate people to take advantage of learning opportunities, and a focus on helping individuals identify and develop new, required & niche skills.

Some of the key topics and areas of learning includes:

- 'Entry-Level Trainee Program' (ELTP)
- Cross-domain / Technical training for the trainees
- Training on Health & Safety for Regular and Contractual Employees
- Soft skills and Domain Training of Contractual Employees



▲ Training Session POSH

- Workshop on 'POSH' (Prevention of Sexual Harassment at Work)
- Leadership Coaching intervention (GROW - Goal Reality Options Way Forward)
- Mentoring and Coaching Skills
- Mind Mapping & Creative Thinking
- An approach for Constructive Feedback on Performance

Average training per employee is 27.6 hours which has increased from last year value of 26.7 hours. Its endeavor to multi-skill its workforce across various lines of work so as to improve the efficacy of its people has continued during the reporting period.

## KPI's FY2018-19

**27.6**

Training hours per employee

**93%**

Key staff retention

**7%**

Attrition

**28%**

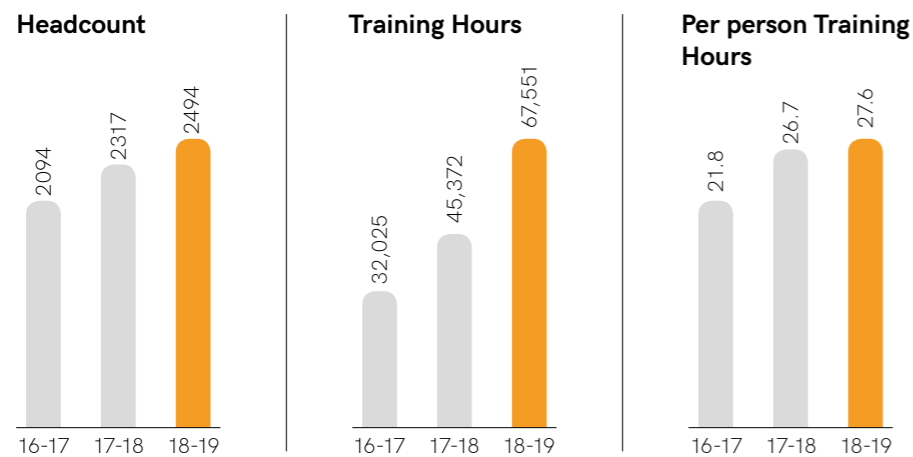
Increase in female employees

**137**

Trainings conducted on Equality, Diversity & Inclusion

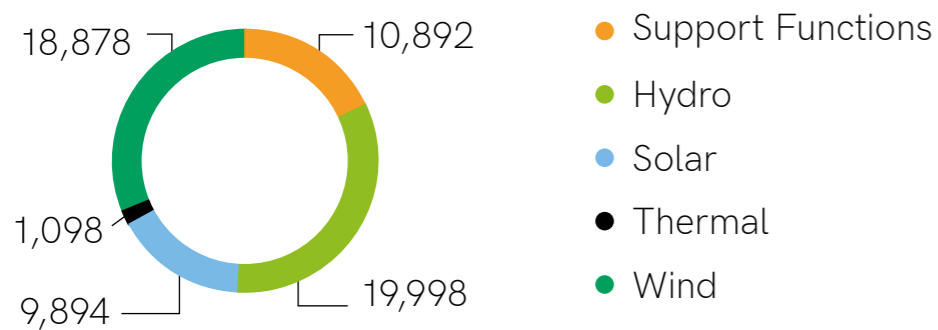
# Human Capital

## Training Hours Per Year and Per Person

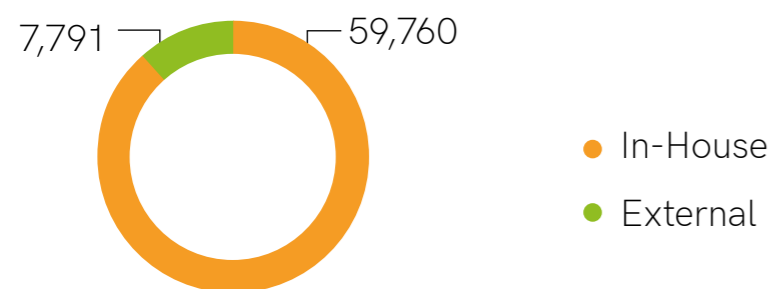


The Group Training Hours stood at 67,551 for FY2018-19 and Safety Training is at 30,206 Hours which is 44.7% of the total training hours.

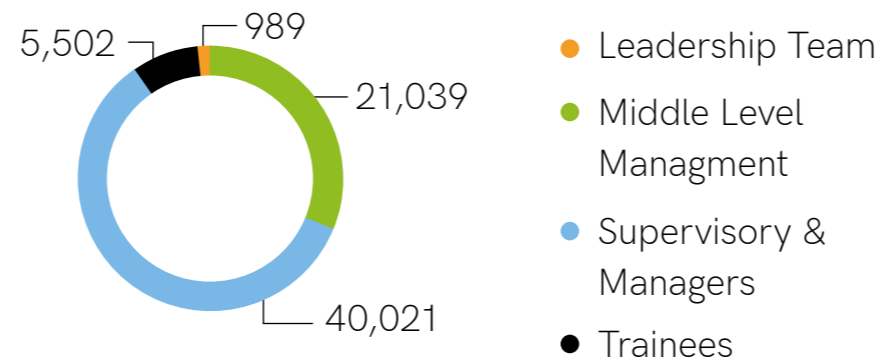
## Training Hours Distribution by Business & Function



## Training - In-House Vs External



## Group Level Distribution of Training Hours



Due to the continuous effort of Greenko in effectively engaging and nurturing human capital, the attrition rate amongst employees reduced by 4% from 11% in 2017-18. The attrition rate for 2018-19 was at a decent level of 7%.

Greenko ensures a quality of life for employees working across the locations including that of people working around the neighborhood of plant and project location. Interventions for the wellbeing of the employees and the people is never compromised when it comes to health and environment.

As many as 105 employee engagement interventions were conducted across the group in 2018-2019. These interventions have contributed in improving the work culture and further enhancing the day-to-day experience of employees.

Greenko values the people based on their creativity, value additions, influence and the impact they make on the final outcome and deliverables irrespective of job level, tenure, or title. Greenko as an institution has embedded team-based thinking internally with the following parameters:

- The Ecosystem:** Have defined purpose-driven teams in the context of the missions they serve within the organization and externally relative to customers, partners, and society as a whole.
- The Organization:** Designed 'front-led' networks of teams that promote multidisciplinary collaboration and empowered decision-making.
- The Team:** Teams were built to demonstrate new agile and collaborative ways of working.
- The Leaders:** Leadership qualities are nurtured and leaders are developed to take up progressive and challenging assignments who in turn build agile and effective teams.
- The Individual:** Nurturing inherent ability to build the high-performance culture amongst individual employees.

The employees are given regular training sessions that nurture their talent and to be well prepared to take up challenges. Employees feel that they are more valued with Greenko's development interventions for nurturing their talent and for cultivating leadership culture.

The senior leadership team takes an active interest in developing potential young talent and mid-level managers for future leadership roles, thus deliberately and 'organically' creating a Leadership Pipeline in the eco-system of Talent Management which can enable Greenko to evolve from GKO 3.0 to GKO 4.0.

Greenko believes in the overall development of an employee, by allowing them to explore areas different

# Human Capital

areas of work. During the year 14% of the employees from Projects and 21% of the employees from Asset Management were engaged it had been cross-functional movement across businesses with a change of roles.

When new hires are inducted into the Greenko family, the hiring team ensures to - instill the company's value systems. With a brief to all the new hires about the journey of Greenko to guiding them on a path suited for success. The induction program is designed to ensure the overall growth and honing of talent. The new hires are made aware of the HR Systems & Policies, (POSH) Prevention of Sexual Harassment at Work, Greenko Values System (SEED IT), Environment, Health & Safety, (GIMS) Greenko Integrated Management Systems and (ISMS) Information Security Management Systems.



▲ HR training on Interpersonal Communication

## Succession planning

As organizations globalize and compete aggressively for top talent, the importance of internal, enterprise wide talent mobility has become paramount. Organizations can no longer expect to source and hire enough people with all the capabilities they need; they must move and develop people internally to be able to thrive. A new set of norms governing internal mobility is needed to do this well. At Greenko, mobility is perceived as a natural, normal progression instead of as a major change in one's career; opportunities to move are extended to workers at all levels, not just managers and team leaders; and technology has enabled a streamlined mobility process for moves between functions, jobs, and projects as well as geographies.

Greenko has instituted a succession planning system wherein potential successor for earmarked critical roles are identified and groomed. During the reporting period, selected employees have undergone the required learning for the new roles in which they have been deployed. Also, 12% of our employees have been promoted from their current level to the next level by reward and recognition and 117 positions were filled through internal transfers.

## Employee Welfare

Employee welfare across all project and plant locations is a primary concern for the HR department at Greenko. Employees are provided free food, accommodation and health care facilities. Apart from looking after its employees' basic needs, the company also encourages people to pursue their higher education. From providing a particular amount of remuneration to employee's children

who are pursuing vocational training to encouraging employees to pursue higher education, the company has always put education as one of its primary interests.

Since the inception of this program, 475 school tuition fee reimbursements and 46 vocational & professional fee reimbursements have been processed.

In addition to fostering education, the company has introduced not just a mandatory maternity leave, but also a customary paternity leave. So far, 22 women and 14 men have taken advantage of maternity and paternity leave. Providing medical insurance coverage to the family including dependent parents is a unique feature at Greenko. Greenko stay vigilant on human rights related issues and there have been no human rights violation in Greenko's work environment.

GRI 401-2, 3; 406-1

### KPI's FY2018-19

**24**

Identify the skills to develop amongst local youth

**105**

Number of employee welfare activities carried out

**22**

Number of persons availed maternity leave

**14**

Number of persons availed paternity leave

**83**

Number of employee engagement events

# Human Capital

## Educational Scholarship Program

Scholarship Program Delivered	25% Reimbursement	50% Reimbursement
No. of Employee's school children availed	462	13
No. of Employee's college children availed	46	0
Employee Higher Education	50%	100%
No. of employees	3	6

Realizing the need to foster the overall wellbeing of employees, the company has in place a medical insurance for hospitalisation through the Greenko Group Mediclaim Policy. The Policy is a valuable welfare measure provided for all the employees of the Group at a cost to the Company and "at no Cost to the Employee". Even a personal accident welfare coverage benefit is provided for all the employees free of cost by Greenko.

In the year 2018 and 2019 a total of 507 Medical Claims have been processed for a hospitalization claim which totaled up to Rs. 1.56 Crores at the Group Level. 42.6% of the total claims settled for a value of Rs.73.94 Lakhs are for 216 Parental health cases. The employee's immediate family claims are settled for 291 cases for a value of Rs. 82.04 Lakhs which is about 53% of the total claims.

## Diversity

Diversity and inclusion amongst the workforce is an imperative culture at Greenko. Diversity is a resource

and a source of value that must be safeguarded and promoted both within the group and in all relationships with its stakeholders.

The initiatives at Greenko to promote gender diversity are:

- Mainstreaming gender in policy design and project implementation
- Implementing policies to attract and retain talent and ensure a supportive environment in the workplace
- Supporting women to become agents of change and to challenge cultural and social norms in their environment

Gender diversity at Greenko saw strengthening with a 28% increase in female employees in the total workforce compared to the previous year. Greenko has become a preferred choice for women to pursue their careers in the Renewable Business Sector. Every year, the company has increased the number of women it employs and today, as compared to its year of founding, Greenko employs 37% more female employees. 7.2% of the new hires amongst women (in the age group 30 to 50 Years) are offered Mid-Level Management roles. 13.42% (in the age group less than 30 Years) have been hired for First Level Management position.

Similarly, we have recruited 4 differently-abled people at different levels of the organization and continue to take need-based efforts to retain them in our workforce.

(GRI 405-1)



Employee Strength	Male			Female			Total
	Age Distribution			Age Distribution			
	<30	30-50	>50	<30	30-50	>50	
Senior management		57	90		3		150
Middle management	25	371	42	2	14		454
Junior management	126	308	8	12	15	1	470
Executives/ Staffs/ Others	407	874	57	44	29	1	1,412
Trainees	113	6		13			132

GRI 401-1

Employee Hiring & Turnover	Gender	New Hires		Separation		Turnover rate (%)	
		Male	Female	Male	Female	Male	Female
	Age Group	<30	149	20	70	5	3.3%
	30-50	125	9	75	5	3.4%	0.2%
	>50	25	0	13	0	0.6%	0.0%

At Greenko, we have realized that everyone deserves equal opportunity. Focusing on equal rights for people from all ethnic groups and cultures, the group has no discrimination in recruitment, location, promotion or any matter related to employment and pro actively removes any barriers to equal opportunity.

For sustained focus to ensure equality, diversity and inclusion across the Greenko, the HR & the Learning & Development teams had 137 training interventions during FY2018-19, - 83 Programs Equality, 33 for Diversity and 21 for Inclusion.

# Human Capital

Women's Day (8th March 2019)



## 2 Safe, Healthy and Lively Workspace

Greenko has an objective of 'Zero Occupational Health & Safety related incidents' across its operations. We are committed to provide a Healthy & Safe work environment for all employees, contract workers, visitors and stakeholders engaged in our operations.

To achieve this objective, series of risk assessments and surveys are conducted in all Greenko's business units to identify and record all the core health and safety issues. Further, action plans are formulated and resources are allocated to address these identified risks according to priority. In the reporting period, 12 such action plans were formulated and implemented.

Risk registers are maintained at all plants and the same is being updated at regular intervals for taking appropriate action based on priority. As a risk mitigation method, Greenko believes in hierarchy of controls, that is for controlling any risk all necessary controls in combination and in order taken bring the risk level to "As Low As Reasonably Practicable" (ALARP).

# Human Capital

Business unit-specific Health and safety plans were developed involving BU leads, EHS team and plant leads, which are in line with ISO 45001:2018 and have been put in place at all plants. The H&S system processes such as work permits, risk assessment, lockout tagout, emergency rescue and monthly review are defined, monitored and analyzed to ensure effectiveness. People Process System audits were conducted across plants for H&S management by external agencies to identify system gaps and process effectiveness to improve O&M and EHS results.

Need-based safety training have been provided to all of Greenko’s employees and contract workers. The number of hours devoted to the safety training of employees and contract workers has significantly increased by 91% over the previous year. The number of hours devoted to the safety training of contract workers alone was 7242



▲ Safety day Celebrations at site

hours. A pool of competent people have been developed in all business verticals by organizing training under acronym matrix. Special Certification from Global Wind Organization (GWO) on Work at Height Training has been provided for selected wind BU team to enrich their competency levels in execution of “Height Work Jobs”. There are 482 first aid trained persons 495 emergency response trained persons spread across our plants and projects.

Inculcating healthy and safe work culture among the employees is very essential to avoid unsafe acts and incidents. To encourage safe behavior among our workforce we have Behavior Based Safety (BBS) mentoring by experts at regular intervals. 1400 hours has been spent on BBS mentoring activity over the previous year.

For incident management, we have ties with local hospitals, dedicated emergency vehicles, EHS walk down inspections to control unsafe acts and unsafe conditions and taking immediate actions to avoid incidents. 2694 unsafe acts/unsafe conditions were identified by such inspections.

To ensure safe and healthy workspace all plant workers are covered under periodical medical check-ups once in a year. A total of 322 mock safety drills have been carried out. 2945 EHS induction programs have been conducted.



## Proactive Indicators

Indicators	Plants	Projects
Safety Training hours Internal (For employees of Greenko & Contractor)	26,027	5,107
Per capita safety training hours	13.01	10.2
Tool Box Meetings	47699	80
Number of audits	137	6
	Hydro-29 Wind-32 Solar-76	Hydro-2 Wind-2 Solar-2
No. of Mentoring Hours for BBS	1,400	300
EHS interventions & celebrations	160	4
EHS Committee meetings	676	60
EHS Induction	2,455	490
Number of Mock drills carried out	294	28
Total number of first aid trained persons	430	52
Total Number of Emergency response trained persons	465	30

## Reactive Indicators

GRI 403-2

Indicators	Plants	Projects
First-Aid Cases	88	20
Near Miss Case	75	15
Unsafe Act / Unsafe Conditions	2,694	530
Fatalities	0	0
Reportable Injuries	7	0
Lost time injury frequency rate	0.468	0
Total recordable injuries frequency rate	3.147	0
Number of safety violations	29	7

GRI 403-1, 3, 4



# Human Capital

## Caring for Contract Worker Health & Safety

Indicators	Plants	Projects
Safety Training hours	7,242	960
Defensive Driving booklets	500	70
Fire Safety booklets	500	100
First Aid Training by external agencies	85	4
Spot the Hazard Competitions	86	15

## Health & Safety, Motivation, Employee Participation

As part of our Health & Safety motivation and employee participation, we conduct several awareness programs, interventions and interventions at regular intervals. National Safety Week is celebrated in BUs with great enthusiasm in which safety competitions like safety slogans, songs, essay writing, safety quiz etc. are conducted to raise awareness. The best safety-conscious worker and staff are recognized and rewarded.

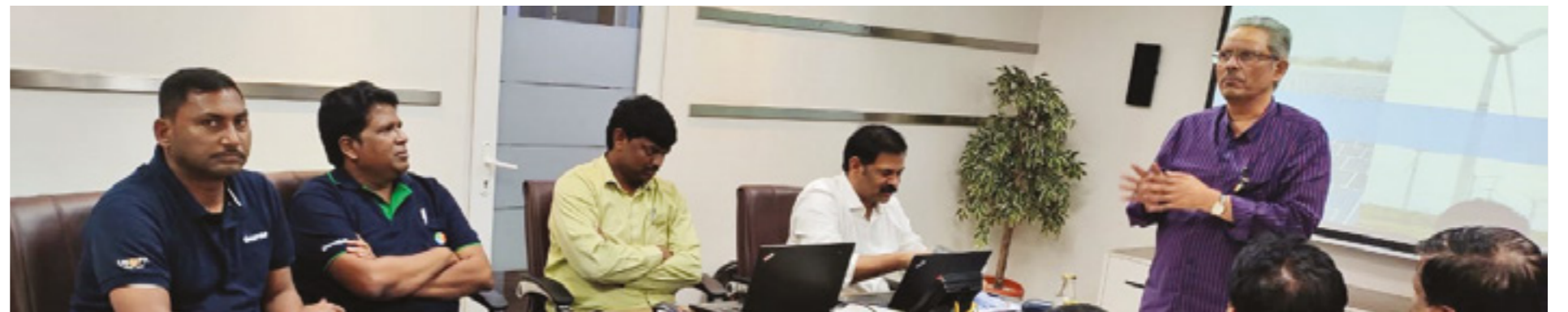
We also conduct special safety training to inculcate safety culture among local public and children in the community we operate. Awareness sessions are also arranged in schools about road safety and home safety.

Number of contractors/suppliers certified for OHSAS 18001	>80%
Percentage of contractors and suppliers screened and categorized based on Health and Safety practices	>80%

## 3 Greenko Security Services

From the date of inception, the endeavor of Greenko is to build a great security culture. It has put in place the Greenko security services (GSS) to take ownership of physical security. GSS takes care of threat and risk assessments, vulnerability and countermeasure analysis. GSS is working as an alert mechanism with an effective surveillance process. At project sites, GSS is the main tool for reconciliation of men and material by monitoring the material movement through an online application Greenko Energy Project System (GEPS). Integrated electronic surveillance at Greenko Group functions on multiple window design principles, by providing live monitoring & recording reviews on 24/7 basis to the central Security Control Room located at HO in Hyderabad and to the site-based security control room. All site activities are continuously monitored by both the monitoring stations to provide instant response.

To cater to the needs of growing organization GSS has been continuously improving by conducting regular trainings, informal interactions, and exposure to contemporary concepts. Only due to the well-developed systems and processes GSS could able to implement the Security systems quickly and successfully in the acquired sites of Sun Edison & Orange Groups. Now GSS is preparing itself for the ensuing task of handling the upcoming gigantic IRESP projects of Greenko.



▲ Training Session - GSS

(GRI 410-1)

# Human Capital

## 4 Greenko Leadership Meet

Business transformation has to be led from the front. As each employee autonomously owns the business outcomes, leadership has to be qualitatively different. Also, as the organization is growing and will grow in the future, the leadership pool has to be accordingly large. It is in this context, the leadership summit was designed and convened for 3 days. All the upcoming young and Mid-Level leaders participated and the senior leaders addressed. From the Asset Management team there were 109, Projects teams 71 and 21 from other support functions participated in the deliberations.

'Collaborate' - 'Exceed' - 'Transform' is the central theme and all the leaders of Greenko are motivated to nurture and practice and encourage learning culture. Total Ownership, Leveraging Technology, Focussed Value Addition leading to Transformation in Thinking are the main themes that were deliberated.

**Anil Kumar Chalamalasetty**  
CEO & Managing Director



“ Our core business activity of renewable power generation is a major contributor for maintaining environmental integrity and mitigating climate change. At Greenko, we focus on continuous value addition to all our stakeholders, energy market and communities through the culture of innovation, good governance and developing strong organizational capabilities to deliver economic and technological solutions with higher barriers addressing the unique challenges of the Indian Energy Market. At Greenko, we have been nurturing young talent to take up the new challenges in our business and this has yielded the good results. ”

**Mr. Vasudeva Rao Kaipa**  
CFO



“ Today, we are on the peak of the journey we began in 2006, with largest RE portfolio in India, hence it is imperative that we sustain and move ahead of the curve beating the odds. We have de risked the company in multiple ways-diversification of technologies, spreading across India, variety of energy contracts and oftakers- and this has and will ensure sustainability of business outcomes. ”

**Mr. Nagendra Dandamudi**  
COO



“ As Greenko transitions from GKO 3.0 to GKO 4.0, it is building the assets to support sustainable growth through the systems, processes and new, best in class technology. ”

# Human Capital

**Mr. Srinivasa Rao Ch**  
Dy COO



The People, Process and Systems framework adopted by GAM and how it needs to be deployed across the organization as a model for organizational transformation.

**Mr. Krishna Kishore C**  
Head - Group HR



Nurturing the Ownership mindset paves way for transformation of every employee to own his / her contribution to the business outcomes. Compliance to SEED -IT values builds the individual character and add value to the employees and the organization at large.

**Mrs. Swathi Reddy**  
Head - Corporate Communications



In pursuit of Greenko's Vision, the employees live by its Values to evolve a Culture and transform it into a Brand that is most admired in the Indian Energy Sector.

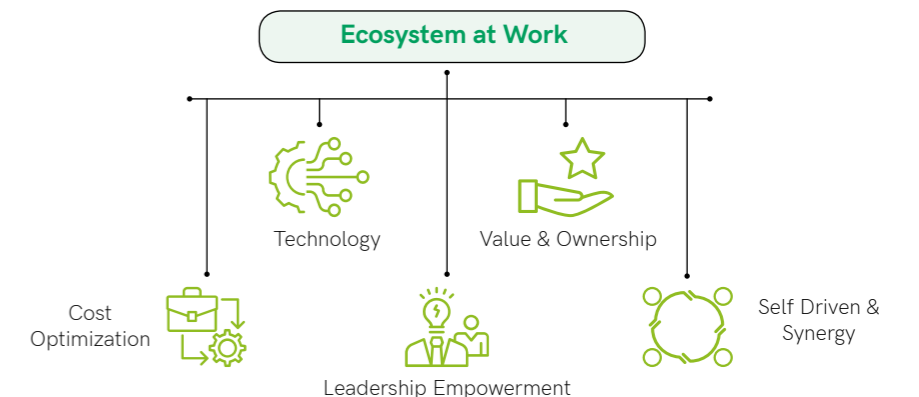
Greenko Leadership Summit had significant participation of women employees enabling them to plan their careers with special focus into Leadership roles progressively.



## Moving ahead

Greenko aims to continue equipping its human capital by attracting, training and retaining multifaceted employee competencies and expertise. It plans on improving its diversity by constantly building a work environment that provides equal opportunities to all gender and ethnic groups. Greenko's safe, healthy and inclusive work environment will be maintained and continuously improved.

For the year 2019 - 20 Greenko has evolved a detailed succession plan for Asset Management, projects and support functions, to meet the demands of the future and promising careers to the most potential and competent employees. We have mapped over 102 critical roles across the levels of projects, asset management and support functions for which 507 employees have been identified for a way forward succession agenda.



# Social and Relationship Capital

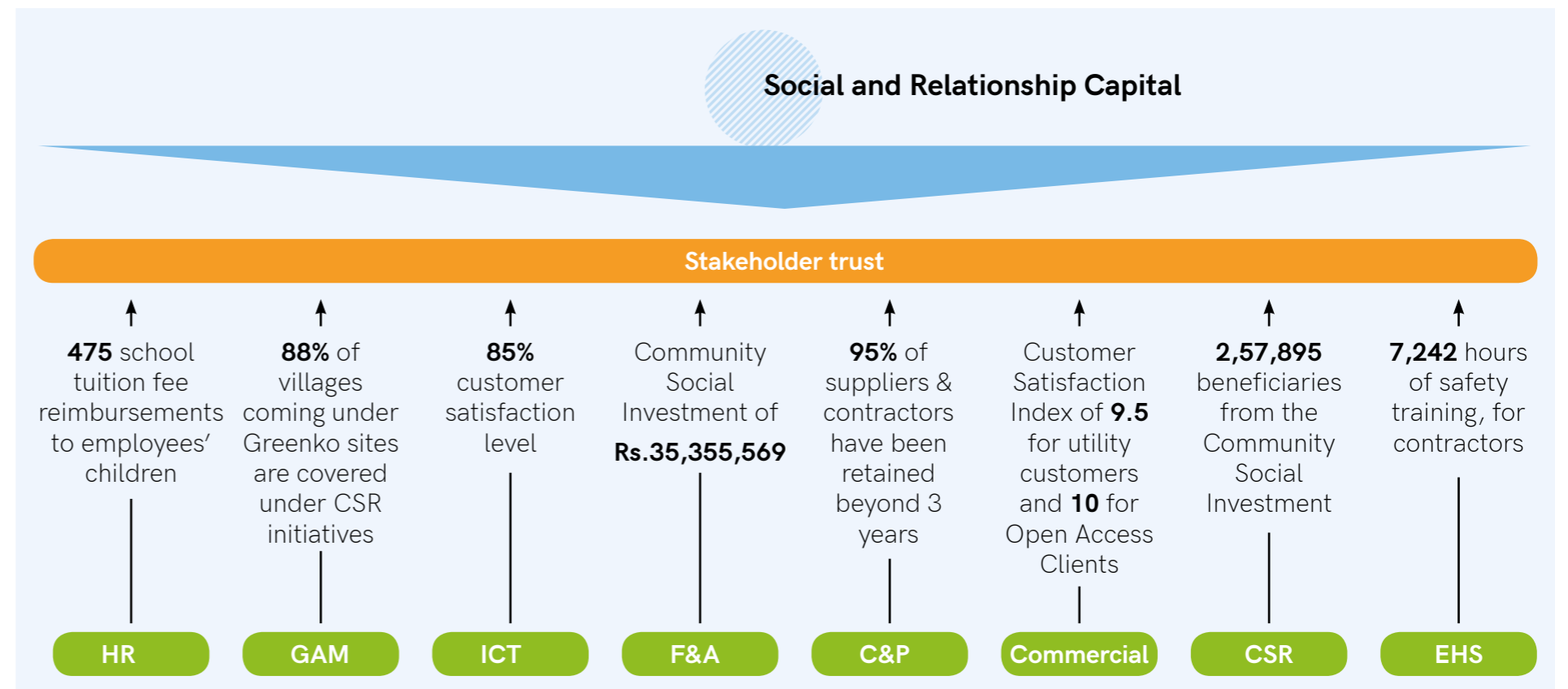
Greenko considers the nature of its operations, as an opportunity to touch and contribute to many lives. Greenko’s partnership with communities enables it to deploy projects on time, manage assets efficiently and provides us the broader social license to operate. All functions and sites contribute to reinforcing stakeholder trust. Teams at sites and in CSR work with communities; procurement function cooperate and co create with suppliers/partners; commercial team engages with and delivers value to customers and finance and investor relations team along with the whole Greenko team work to deliver value to investors and shareholders. Greenko has been engaging to assist public policy formulation to promote schedulable /Round-the-Clock renewable power. Performance on social and relationship capital demonstrates that the stakeholder trust is being reinforced.

As Greenko transitions to GKO 3.0 and 4.0, developing and nurturing qualitatively different relationships and partnerships are imperative. Engagement to shape public policy will be more active but objective and ethical.

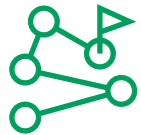


## Strategic Approach

Greenko’s business operations are situated amongst people and is intertwined with their livelihood. Greenko considers the nature of its operations, as an opportunity to touch, contribute and impact many lives and contribute to their well being. Greenko’s partnership with communities, contractors and suppliers enables it to deploy projects on time, manage assets efficiently and provides broader social license to operate. Further, the transition to GKO 3.0 & 4.0 requires Greenko to develop new partnerships and engagement models. Greenko is aware that the new partnerships will be at risk and reward sharing with relatively fewer controls and more uncertainties.



# Social and Relationship Capital



## Journey so far

**Greenko believes that the external stakeholders viz., communities, contractors, suppliers, regulators, customers, are salient factors of growth. These multi-faceted stakeholder relationships in turn form the basis for strong partnerships which aids us in creating value and sharing value.**

**Greenko works to increasingly engage its Stakeholders in all of the company's activities and operations. Throughout the value chain, Greenko interacts with thousands of people and organizations that make up its social and relationship capital, which is a fundamental element for the sustainable performance of the company. Greenko has made advances in structuring partnerships that are risk and reward sharing and delivers value for all the stakeholders.**

### 1 Mutually beneficial long-term partnerships

Greenko strives to build partnerships with suppliers, contractors, regulators and customers based on trust and shared values that are essential for working

cohesively and effectively over the long term so as to deliver affordable, reliable and clean power.

Greenko enters into partnership with suppliers and contractors after diligent screening and performance evaluation based on criteria such as Quality, Delivery, Quantity, EHS compliance and statutory compliance. Selected contractors are also given Health & Safety and skill development training. In the reporting period, 75% of our contractors' skills were upgraded through trainings.

Vendor relationship is strengthened by conducting review meetings at regular intervals.

Few contractors/suppliers with whom Greenko has made valuable purchases are Siemens Gamesa, Risen, Huawei, TATA Power Solar, Toshiba and ABB. We have entered into strategic partnerships with MP Solar Project and Tata Power Solar. Greenko has entered into long term agreements with suppliers for WTGs, Modules, Conductors, Insulators and SCADA.

### Framework Agreements and Sustainable Partnerships

Cost of turbine constitutes a significant proportion of hydro power and wind energy project costs. Turbine

suppliers are limited and the demand for turbines outstrips the manufacturing capacity. Greenko turbine procurement strategy is to establish framework agreements and developing strong relationships with leading turbine suppliers to secure the turbine requirements. To date, the company has purchased hydro turbines for high-head hydro power projects from Alstom, hydro turbines for low head projects from BFL Turbines and wind turbines from GE Energy, Gamesa, ReGen Powertech and Suzlon.

### Solar Energy Project Suppliers

Operating equipment for solar energy projects primarily consists of solar panels, inverters, cables, solar mounting structures, trackers and the evacuation system. Greenko purchases major components such as solar panels and inverters directly from multiple manufacturers. There are several suppliers in the market and those suppliers are selected based on expected cost, reliability, warranty coverage, ease of installation and other ancillary costs. Greenko's primary solar panel suppliers are Trina Solar, Chint Solar and Risen. Greenko also sources solar inverters from SMA Solar.

# Social and Relationship Capital

## Transmission and Interconnection

As the availability of transmission infrastructure and access to a power grid or network are critical to a project's feasibility, Greenko ascertains transmission capacity from public sources and owns proprietary data during the prospecting stage. Greenko discusses availability with the relevant state utilities and files an application with the relevant authorities to interconnect with the network. Power from wind and solar farms is typically evacuated to the relevant grids through high voltage 33/220 kV transmission lines from dedicated pooling stations that results in stable energy transmission and minimizes electricity grid stability issues.



▲ Greenko Team at RE-invest meet

## KPI's FY2018-19

# 9.8

Contractors Satisfaction level

# 10

Suppliers Satisfaction level

# 95%

Of retained suppliers / Contractors beyond 3 years

# 7

No. of events conducted for suppliers and contractors

# 98%

Of total value of contracts that were awarded through an open and competitive process

# 80%

Proportion of spending on local suppliers / Contractors (GRI 204-1)

# 5

Number of Long-Term Agreements entered with Suppliers / Manufacturers

# 98%

Of orders delivered on time



“ Greenko strives to build partnerships with suppliers, contractors, regulators, and customers based on trust and shared values that are essential for working cohesively and effectively over the long term to deliver affordable, reliable and clean power. ”

**Dr. M. M Rao**

Senior Vice President – CMM/Procurement



▲ Greenko stall at 2nd Global RE\_Invest - Investors Meet and Expo, 3-5 Oct. 2018

## 2 Customer focus

Greenko values its customers and makes continuous efforts to meet their expectations. Customers of Greenko include, state- owned and privately-owned distribution companies, industrial and commercial bulk users of electricity.

The distribution utilities who are customers of Greenko often face challenge due to the inherent non-firm nature of renewable energy supplies. Greenko understands

# Social and Relationship Capital

these challenges and works in cooperation with them to address and provide electricity on demand by forecasting the schedule to the extent feasible. The performance record of Greenko in providing the power as per schedule is demonstrated by low penal charges. The industrial and commercial bulk users face challenges from the transmission and distribution utilities and due to frequent changes in regulator determined charges for wheeling, banking etc. In such situations, Greenko works with the regulator and utilities to provide an uninterrupted and reliable power supply to industrial and commercial customers. Greenko also sells power on the energy exchanges and interact with both the operating exchanges in India to make the trade more effective and rewarding to the involved parties.



▲ Inauguration of RO plant at Muddinayunipalli, AP

## KPI's FY2018-19

Contractors Satisfaction level

**9.5** for utility customers and

**10** for Open Access Clients

**6** Number of new customers added in FY2018-19

Customer Profile

**90%** Public Utilities

**8%** Pvt Customer base

**2%** Exchange sale Based on the PPA capacity tied up



▲ Greenko stall at 2nd Global RE\_Invest - Investors Meet and Expo, 3-5 Oct. 2018



▲ Distribution of School Bags & uniform

# Social and Relationship Capital

## 3 Sharing value with the community

Greenko is committed to inclusive development of all our stakeholders. It aims to improve the quality of life of neighborhood communities through proactive and smart initiatives in education, health, rural development, environment and livelihoods.

**KPI's FY2018-19**

### 233

Number of Community development programs

### 160

Number of structured engagements with community

### 130

Number of community development support requests addressed so far

### Rs.35,355,569

Community Social Investment

### 257,895

Total number of beneficiaries from the Community Social investment

GRI 102-12; 203-2 ; 413-1

### 37

Number of co-creation projects done through participation of local community / local bodies/ line departments

### 12,283

Number hours volunteered by employees

### 155

Number of community development support requests received

### 110,000

No. of Saplings Planted

### 9

Community satisfaction index

### 95%

operations covered under CSR programs

Indicators	Solar	Hydro	Wind
Total number of villages coming under Greenko sites	86	50	78
Total number of villages covered under CSR initiatives	64	46	78

### Last Mile Intervention in Education

The objective of this initiative was to provide access to quality education in government-managed schools located in the neighborhood communities. This was achieved through a meaningful and fruitful dialogue with the government run schools. Some of key interventions on this front were (i) construction of boys' and girls' toilets, (ii) drinking water facility etc., (iii) support for improving the quality of education by providing additional teachers and conducting educational competitions, (iv) support for students and classroom infrastructure and (v) promotion of local Sports and cultural activities. During the reporting period, 148 such activities were conducted which benefited 34,152 students.

### Diagnostic and Preventive Health Care

In healthcare, major interventions undertaken were general health and eye screening medical camps, conducting specialized diagnostic screening and treatment (DST) eye camps and mobile clinic health camps. Mobile clinics are upgraded compared to the previous year. In the reporting period, 52 general screening camps,



# Social and Relationship Capital



▲ Program on Menstrual Hygiene Management in state of Telangana

2 DST eye camps and 57 mobile clinic health camps were conducted which benefited 16,936 people in the community.

In addition to this, a menstrual hygiene management program was implemented in the state of Telangana in association with "Days for Girls International".

The main objective of access related intervention was to increase equity and access to health services by supporting the existing health system through provision of doorstep health services. Mobile health units not only look after the curative and referral aspects but also render behavioral changes and awareness to promote healthy lifestyles. Greenko introduced the MHUs in 4 Clusters located in Andhra Pradesh and Karnataka.



▲ Greenko Mobile Clinic Health Camp in operation

The MHUs are equipped with basic medical equipment, medicines, and staffed by a Doctor, a Pharmacist and a Nurse. The MHUs cover one -two villages in a day and the monthly route plan of the MHU is notified in advance to the local communities. The types of services rendered through MHUs include

- General health screening and treatment of general illnesses
- Treatment of minor ailments and first aid
- Diagnostic services for BP, Diabetes, CBP etc
- Referral of complicated cases
- Early detection of infectious and non-communicable diseases
- Ante-natal and Post-natal check-up
- Treatment of common childhood illnesses such as diarrhea, ARI, pneumonia and other illnesses



“ Greenko is committed to inclusive development of all our stakeholders. It aims to improve the quality of life of neighborhood communities through proactive and smart initiatives in education, health, rural development, environment and livelihoods. ”

**Diwakar CVS**

Vice President - Corporate Social Responsibility

- Adolescent care including lifestyle education, counseling, treatment for anemia and other minor ailments

**The following milestones were achieved in the reporting period:**

- 4 MHUs operationalized;
- 40 to 50 Villages covered;
- About 30,000 population covered;
- 5,000 people received benefits of OPD service;
- 4,000 people benefited from free medicines;
- 5,000 people getting counseling and health education services;
- 4,000 people getting benefits of laboratory diagnostic services;

# Social and Relationship Capital

The above program received an overwhelming response from surrounding villages and in the medium term the following impacts are seen:

- Decrease in expenditure towards OPD services
- Early detection of Non-Communicable Diseases
- Early detection of severely malnourished children
- Reached out to at least 50% of the households in the villages through mobile health services
- Ensured that those needing referral are linked to tertiary care facilities
- Ensured that the target population are aware of correct basic preventive health care practices

## Livelihood and Drinking Water in Rural Areas

Rural development programs are initiated in consultation and coordination with local panchayats. Based on the inputs from the local stakeholders the interventions are designed for rural development projects.

The two major interventions in this front are Clean drinking water and livelihood development. Clean drinking water was made available to the target communities by means of installing RO plants and construction and renovation of open wells. In livelihood development, 25 local farmers were trained through capacity building programs in organic farming and 475 local youth were given skill development training.

### KPI's FY2018-19

# 1,071

Quantity (KLs) of filtered water supplied to communities through RO Plants

# 475

(Skill Development Center at Kurnool Solar Park/ Computer Center at Dikchu/ Farmers Training)

Skills upgraded amongst community



▲ Certification Event - Skill Development Center at Kurnool Solar Park

Providing clean drinking water has been a priority for the Government of India. Till March 2017 close to 28,000 habitations were identified across the country that were arsenic, or fluoride affected.

Anantapur and Kurnool Districts of Andhra Pradesh State were chosen as the target area for implementation of the above Program. These Districts were chosen as they are identified as fluoride affected Districts under the National Water Quality Sub Mission. The main objective of the above initiative taken up under rural development thrust area was not only to provide safe drinking water but also to improve the health standards of the local community and protect them from water-borne diseases.

The above initiative was implemented as a co-creation and collaborative community development activity in association with the local Panchayath bodies.

Most of the RO plants installed have the capacity to purify and provide 1,000 liters of safe drinking water per hour to the local people. The necessary material and equipment for the RO Plants was sourced from reputed agencies such as TATA Projects, ATP Aqua Systems who are responsible for installation and annual maintenance of the Plants. The RO plants were operated by a trained local operator from respective villages who is responsible for day to day maintenance of the Plant, distribution of water among the households, record keeping, bringing awareness on benefits of the clean water and address any grievances of the local people.

# Social and Relationship Capital

The Program was initiated in 2016-2017 and till reporting period (31st March 2019) the following milestones were achieved:

- 12 RO Plants installed and in operation;
- 2 RO plants installation in progress;
- 20 Villages covered;
- 11,000 people directly benefited;
- 1,071,000 liters of safe drinking water supplied for the reporting period.

The above initiative is widely welcomed by the local people and considered an important and necessary asset in the overall access to the basic amenities of a model village. As a collaborative program it has strengthened the community participation and enhanced the community engagement process



## Moving ahead

We are constantly working towards CSR targets and goals set for 2020. Below are the goals set under the above discussed focus areas that are in line with the SDGs 2030.

- **Education:** To be able to make a difference to about 15,000 students through our interventions in government run schools, among children and the community near our operational presence.
- **Healthcare:** To be able to provide access to quality Health care to over 50,000 people living in communities of our operational presence.
- **Rural development:** To be able to improve the living standards of over 100,000 people mainly by way of improving the basic amenities and rural infrastructure in the neighbouring villages.
- **Livelihoods:** To be able to provide an opportunity for improving the livelihoods of over 25,000 people mainly by way of providing skill training in the neighbouring villages.
- **Environment:** To be able to plant and care at least 200,000 tree in and around our operational presence and neighbouring villages.

Further, we will continue to strengthen our partnerships with suppliers, customers, regulators and the government. For our new projects and initiatives, as we transition to GKO 3.0 and 4.0, we will identify, develop and nurture qualitatively different relationships and partnerships. Our engagement with the public policy will be more active as well as objective and ethical.



▲ Rural development - construction of bus shelter



▲ Health program - distribution of spectacles at eye camp

# Natural Capital

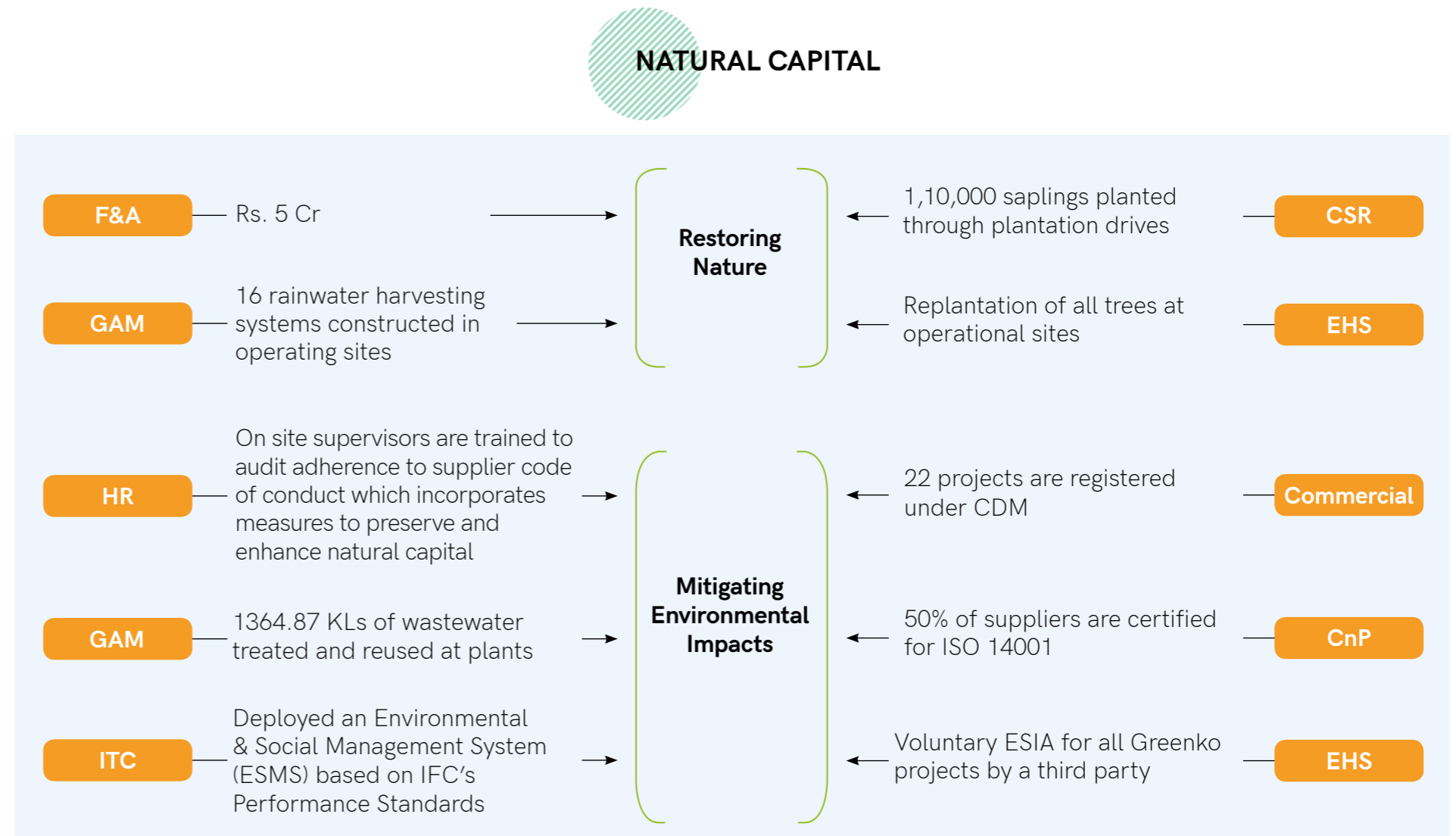
Greenko’s business is designed to harness the opportunities in transition to sustainable development. Greenko is determined to take necessary steps and be a catalyst for change to protect planet, while improving People and Profits. Every function, more specifically project and asset management teams, contribute actively to caring for environment. Review of Greenko’s performance during the reporting period demonstrate that continuing efforts in minimizing use of resources and generation of waste. Further, Greenko contributes to conservation of terrestrial ecosystems at their sites, recharges and reuses water, conserves soil and natural drains. Greenko contributes to conservation of avi fauna and marine life in some parts of India. Going forward, Greenko has set short-term and long-term targets for protecting and enhancing the natural capital.

Greenko has set a target to make at least 85% of its critical suppliers certified by ISO 14001 and RoHS compliant by March 2020.

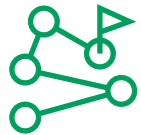


## Strategic Approach

Greenko’s business is designed to catalyze the development in consonance with nature. Accordingly, it’s business inherently contributes to mitigation of harm to nature. In addition, Greenko is committed mitigate any negative impact on nature negatively across its operation and value chain to the extent possible. In addition, Greenko is proactively contributing to conservation of ecosystems and managing impact across life cycle of its power plants.



# Natural Capital



## Journey so far

**Greenko's objective is to preserve and enhance nature throughout its value chain. Greenko is determined to take necessary steps and be a catalyst for change to protect Planet, while improving People and Profits. In this spirit, Greenko is steered towards contributing to the national issues and to ensure that the group's activities respect, promote and advance internationally recognized environmental principles & commitments.**

### 1 Mitigating Environmental Impacts

In pursuit of excellence, Greenko remains vigilant towards usage of natural resources and is responsible in reducing the impact on environment.

Greenko carries out Environmental and Social Impact Assessment (ESIA) study prior to the commencement of any operations, in line with the requirements of ten Equator Principles; eight International Finance Corporation (IFC) Social & Environmental Sustainability Performance Standards (PS); and IFC Environment, Health and Safety (EHS) Guidelines. All new projects developed by Greenko have undergone ESIA to pro-

actively mitigate any issue that adversely impacts natural capital. All impact mitigation measures, which have arisen out of this voluntary ESIA, have been taken up for implementation.

Further, Greenko has implemented the following related initiatives:

1. ESMS implementation
2. ESMS training
3. Green Procurement
4. Preservation of Biodiversity



### 2 Adherence to Environmental Norms by Contractors and suppliers

To preserve and enhance nature throughout the value chain, the contractors and suppliers of Greenko also are required to adhere to environmental norms beyond compliance. This is achieved by Integration of environmental performance considerations in existing procurement processes. More than 50% of Greenko's suppliers are certified for ISO 14001. Greenko's SCM team is also creating awareness among vendors/suppliers on environmentally preferred goods and services.

GRI 307-1; 411-1; 412-1; 413-1; 416-1, 2 414-2;

# Natural Capital

Greenko’s projects involve contractors who play a significant role during the construction stage. To involve them in preserving /conserving natural capital, the EPC contractors, OEM and civil contractors are required to sign and adhere to a Supplier Code of Conduct that incorporates measures to mitigate impact and preserve nature.

KPI	Value
Suppliers certified for ISO 14001	50%

GRI 102-10; 308-1, 2

### 3 Contributing to Climate Mitigation

Greenko’s choices of energy generation helps in conserving the limited natural resources and consequent emissions, discharges and disposal. Further, it mitigates the GHG emissions and thus climate change by displacing fossil fuel. Greenko has avoided 8 million tons of CO<sub>2</sub> by generation of clean energy. In addition, the group has till date registered 22 Clean Development Mechanism (CDM) projects with UNFCCC.

KPI	Value
Direct and indirect GHG emissions avoided	5.9 million tons of CO <sub>2</sub>

#### GHG emissions

GRI 305-5

Scope	Emissions (tCO <sub>2</sub> e)	Coverage
Scope 1	2,87,992	a. Diesel consumption in DG sets b. SF <sub>6</sub> recharged in circuit breakers
Scope 2	17,150	Electricity purchased from grid
Scope 3	855	Employee and monitored contractors’ business travel

GRI 302-1,3; 305 -1,2,3,4,5,7

#### Emissions avoided (in ton)

<b>5.9 Mn</b> tCO <sub>2</sub> avoided	<b>34,439</b> tNOx
<b>7,031</b> tPM10	<b>52,376</b> tSOx

### 4 Managing Waste beyond Compliance

At Greenko operations, waste management is based on Environment and Social Management System. The ESMS requires conformance to legal requirements along with reducing the generation of wastes and to reuse or recycle whenever possible. The guidelines are followed for

GRI 301-2; 306-2



**“ All new projects developed by Greenko have undergone ESIA to pro-actively mitigate any issue that adversely impacts natural capital. All impact mitigation measures, which have arisen out of this voluntary ESIA, have been taken up for implementation. ”**

**Sandeep P**

Associate Vice President, SPG Operations

identification of the waste streams, their classification, manner of collection, transport and appropriate final disposal. Greenko carries out continuous monitoring of generation, storage and treatment/disposal of wastes by its contractors and vendors. Greenko conducts environmental education program for employees and partners, and finds it very effective in reducing, segregating, and managing waste.

Waste management	Solar	Hydro	Wind
<b>Hazardous waste</b>			
Used batteries (kg)	202	734	4,942
Used Oil (kg)	845	12,582	16,605
Chemical waste (kg)	20	0	619.8
Oil soaked cotton /cloth (kg)	250	1,538	7,589
<b>Non-Hazardous waste</b>			
Packaging waste (kg)	1,423	181	426
Paper waste (kg)	310	64	187
Wood (kg)	4,274	500	105
Metal scrap (kg)	7,303	50,359	17,033
Plastic and rubber waste (kgs)	1,164	1,316	75
Kitchen waste (kg)	269	6,502	13,683
<b>E-waste (kg)</b>			
Information technology and telecommunication equipment (kg)	27	119	20
Consumer electrical and electronics (kg)	150	172	150

GRI 306-3

Significant spills	Solar	Hydro	Wind
Oil spills (liters)	50	233	100

# Natural Capital

The wind, solar and hydro projects do not consume any fuel for the power generation. Thus, the material consumption in these plants is only towards the O&M of plants.

GRI 301-1

Materials	Solar	Hydro	Wind
Lubrication Oil (engine oil, gear oil etc.) consumed (liters)	990	6,124	50,768
Turbine Oil consumed (liters)	NA	16,011	NA
Transformer Oil consumed (liters)	10,000	7,614	2,848
Grease consumed (kg)	890	575.5	9,871
SF6 Gas (kg)	0	35	2

\*NA - Not Applicable

## 5 Water Resource Management

Greenko owns and occupies sites of significant area through which natural drainages flow and water recharge and storage happens. Accordingly, whenever there is any modification in landscape at operational stage, Greenko ensures that the water resource system is not negatively impacted. Further, it makes the best efforts to restore traditional water resources as also ecological and water resource functions of landmass.

Water conservation measures have been implemented in all of Greenko plants. Rain Harvesting Pits, Storm Water Drainages and Rain Water Gutters have been constructed for conservation of water resource. In water-stressed regions rainwater harvesting has been implemented in the office and control room buildings. The water used for gardening is supplied by micro-irrigation (drip or

sprinkler). Greenko ensured a substantial decrease in water consumption for Solar PV Modules cleaning activity with implementation of "MCS & Overhead Water Tank". In a few Hydro Plants, arrangements have been made to divert and re-use of spillage water.

GRI 303-1, 2, 3

Water management	Solar	Hydro	Wind
Total quantity of water used for plant operations in lit	35,000,000		842,000
Total quantity of water used for office and domestic purposes in lit	8,581,123	13,627,265	7,599,200
Total quantity of wastewater treated and reused (for gardening, plantation etc.) in lit	1,080,000	226,750	60,220
Total Number of rain water harvesting systems available	12	0	4
Total quantity of rain water collected and consumed (KL)	83,664,055	20,000	2,900,000

### Watershed management at Kurnool

A water management program has been implemented in Ghani Solar Park, Kurnool, that promotes conservation of water by the construction of check dams and water canals around the operating site.

A total of 28 check dams and 12 kms long canal has been constructed in the solar park which assists in rain water catchment and the water is subsequently diverted into the reservoirs.

This water management program has resulted in better harvesting of the rainwater and its conservation by increasing the groundwater level in the region. This initiative has eventually benefited Greenko itself, the water that is required for the plant operation is procured from the improved water table instead of external sources.



▲ Environment & Safety Pledge by Greenko Leaders

# Natural Capital

## 6 Energy Efficiency Initiatives

Greenko, across operations, practices energy conservation. Energy efficiency initiatives/ programs across our Greenko include

- (i) use of CFL & LED lighting,
- (ii) regular maintenance of the auxiliary equipment,
- (iii) operational management of hydro plants- arresting water leakage through proper Grouting work in powerhouses avoiding the operation of pumps,
- (iv) commissioning energy-efficient 5-star rated ACs and
- (v) lighting controls automation with the installation of an outdoor light sensor timer.

GRI 302-4,5

## 7 Contributing to Biodiversity

Greenko takes proactive measures to restore, protect and enhance the biodiversity. Greenko has taken up a few bio-diversity conservation projects. The Fish stock seeding initiatives in the Netravathi river aims to protect the local ecology and bio diversity by fish stock seeding at its Hydel Plants on an annual basis. This program is undertaken in coordination with the Fisheries Department, Government of Karnataka. From the above initiative about 2,000 local fishermen residing nearby the reservoir are being benefited.

Other biodiversity protection programs taken are adoption of Rollapadu bird sanctuary for the conservation of the Great Indian Bustard, disentangling Ridley turtles and transplanted of the trees at project sites.

Some other significant initiatives taken are greenbelt development using micro-irrigation in our operating sites, bird nest development, drinking water holes for wild animals, fencing of water bodies near hydro plants to avoid accidents to animals, protection of tailrace sides with protective walls to avoid erosion in Hydro plants, fencing of HT lines/ transformers to avoid animal entry (Solar/ Hydro/ Wind)

Biodiversity management	Solar	Hydro	Wind
Number of trees planted	57,705	2572	6,800
% Plant survival over last three years	70	61	81
Total Area of greenery developed (m2)	101,382	14,889	11,450
New bird nests provided	NA	0	11 Sites
Existing nests protected	NA	0	11 Sites
Fish seedings done (kgs or Number)	NA	150,000	NA
Number of Noise mitigation measures taken	NA	0	23

\*NA - Not Applicable

## Tree Transplantation

We have adopted the following steps during the process of transplantation.

1. Soil sampling and site selection
2. Root pruning and tree packing
3. Transplantation of trees
4. Mechanical support and root pruning
5. Post-transplantation treatment

## Biodiversity enhancement at Rayala

At Greenko's Rayala wind power site, an initiative to conserve and protect butterflies was undertaken. This is achieved by developing organic farm and plantation of high nectar flowers, Marie gold and Hibiscus, within the project boundary.

As a result of this program, the population of butterflies in the garden has increased. The vegetation in the site has also increased significantly. As an added advantage, organic vegetables from the garden are used in our sites' cafeteria.

GRI 304-1, 2, 3



# Natural Capital

## Project Disentangling Sea Turtles

Greenko has sponsored Project 'Disentangling Sea Turtles' with WWF India. The following progress is reported in 18-19.

- Pilot surveys in Goa have been completed. All stakeholders including fishermen, life guards, officials from Forest and Fisheries' Departments of the Government, are engaged
- At Vizag , Dolphin Trawl Association and Fisheries and Forest Department of the government have been engaged and involved
- Field team is put together and all preparations to undertake monitoring are completed. The activities of monitoring and conservation would begin after necessary permissions are obtained.



▲ Project disentangling of turtles: Interaction with the fishermen community at Vizag

## Conservation of Great Indian Bustard

In pursuance of commitment towards Biodiversity Conservation and Sustainable Management of Living Natural Resources Greenko is supporting the "Habitat Conservation and Species Recovery of Great Indian Bustard (GIB) at Rollapadu Wildlife Sanctuary (RWS)". Greenko is going to work along with Govt of Andhra Pradesh and Forest Department to achieve and maintain a favorable conservation status at Rollapadu Wildlife Sanctuary.

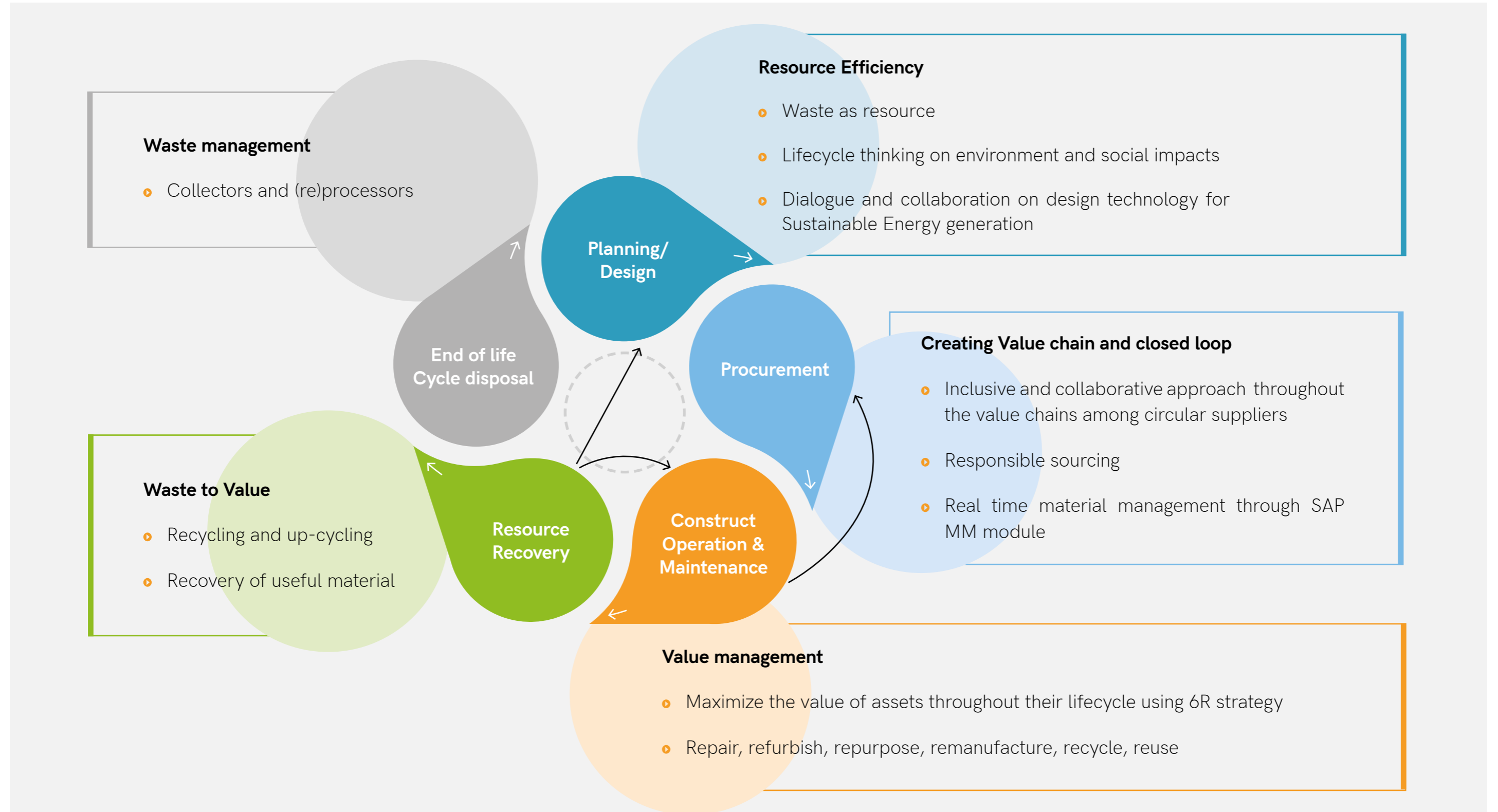


▲ Great Indian Bustard

# Natural Capital

## Circular Economy across our project stages

Our advances in environmental improvement



# Natural Capital

## Planning/Design

### Waste as resource

- Project development on Waste land (barren/scrub/rocky) for installation of Plants

### Sustainable Energy generation

### Resource Efficiency

- No destruction of sensitive habitats to preserve flora and fauna
- Non-consumptive use of earth's limited resources

### Lifecycle thinking on Environment and social impacts

- Conducting Environmental Impact Assessment of infrastructure during planning and construction



▲ Bird nest provided at wind site in AP



All biodiversity, natural water streams and land contours are maintained in all project site, where possible

# Natural Capital

## Procurement

### Responsible sourcing

- Real time Material management through SAP MM module



Inclusive and collaborative approach throughout the value chains among circular suppliers

**Optimize value chains and greater value to end user**

**Just in time procurement - reduced inventory value**

**SAP S4/HANA: Material Management:**

- Connecting physical inventory to the digital grid. Remote access, monitoring, and information on a inventory status and location.
- Transaction costs are reduced and with access to information availability increases/reduction in purchase, connecting cluster level store to all plants
- Decentralized Procurement process, reduced logistics and focusing on a local chain of production, consumption and return.

Award winning sustainable and green procurement initiative

Framework Agreements and Sustainable Partnerships

# Natural Capital

## Construct Operation & Maintenance

### Value management

- Maximize the value of assets throughout their lifecycle
- Repair, refurbish, repurpose, remanufacture, recycle, reuse
- Redesign and construction



With Proper ventilation to Inverter rooms reduced auxiliary consumption and improved generation by 1.35%.

Repair of Leading-edge protection, repair of blade anomalies and preventive replacement of blades.

### Repair

#### Wind turbine rotor blade repair

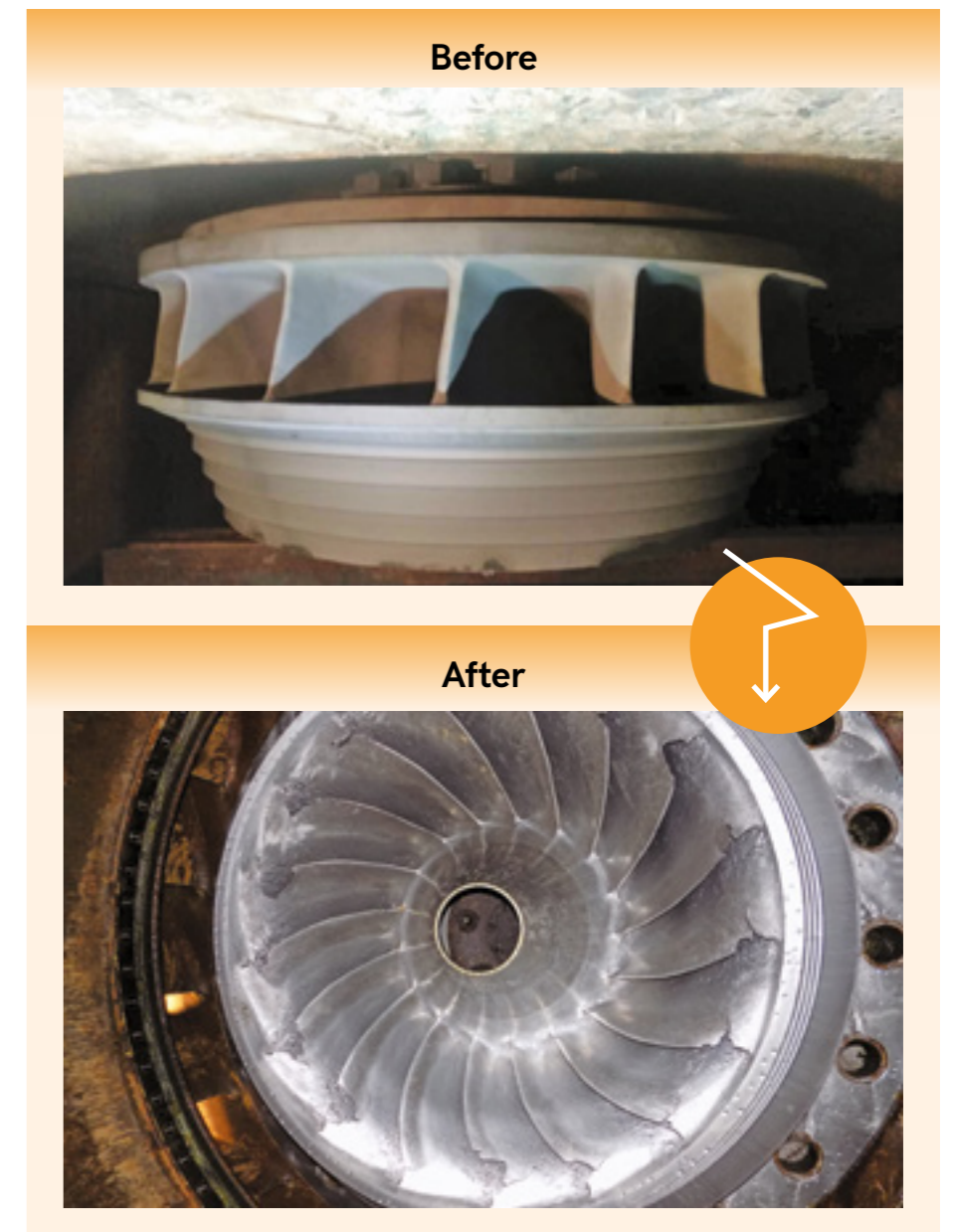
- Generation improvement by 3%



### Refurbish

#### Enhance the life of the Runner

- Application of HVOF Coating Runner



# Natural Capital

## Resource Recovery

### Waste into value

- Recycling and up-cycling
- Recover useful material
- Many innovative wealth from waste projects
- Rainwater harvesting and treated municipal waste water is used for gardening
- Banned single use plastic in office, meetings rooms etc.

### Wealth from waste projects



▲ Storage Racks and Mess



▲ Canopy Arrangement for Fire Extinguisher



▲ Banned single use plastic



▲ Treated water is used for gardening

## End of life Cycle disposal

### Waste management

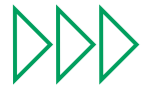
- Collectors and (re)processors
- Own buyback contract
- Used batteries are disposed on buy back scheme
- All Hazardous waste and e-wastes are disposed to PCB authorized vendors and adherer to hazardous and non-hazardous solid waste framework
- RO wastewater is beginning used for gardening purpose.
- Packaging materials of all raw materials are reused onsite for useful applications
- End of project life material recycling agreements are in discussion with various technology companies (as projects are still new)



▲ Waste oil storage at site

GRI 301-2,3; 306-2,4

# Natural Capital



## Moving Ahead

Greenko pro-actively participates in public policy advocacy for deeper decarbonization in India through business and city government voluntary commitments.

Greenko has set a target to make at least 85% of its critical suppliers certified for ISO 14001 and RoHS standards by March 2020 and at least 95% by FY 24. To stimulate innovation and demand for environmentally preferred goods and services, Greenko aims to arrange vendor meet by covering at least 50% of its vendor base by 2020 and at least 90% by 2024. Similarly, 75% of all critical items shall be covered by performance measurement and life cycle assessment by 2020.

Greenko is striving constantly to reduce its carbon and water footprint, and material usage by adopting new technologies, improving operations by value maximization programs and continuous improvement.



## Epilogue from the President & JMD



“

The size and scale of Greenko, its expertise and access, makes it possible to address the challenge of powering India's growth with clean, reliable and affordable electricity. ”



**Dear Stakeholders,**

'Climate change' is real. We are witnessing more frequent 'extreme weather events' across the globe. There is a concern all around. The challenge is to act coherently to mitigate and adapt to climate change while 'powering' billions to access fruits of development. Fortunately, solutions are available and feasible. Convergence of



# Epilogue From President & JMD

technological advances and social and economic changes - electrification, decarbonization, digitalization and decentralization - can successfully address the challenge of decarbonization and powering the developmental challenges.

The Fourth Industrial Revolution - a convergence of digital and multiple technologies lead to unprecedented paradigm shifts in the economy, business, society, and individuals. The electricity landscape too is, undergoing transformation, becoming more complex than ever before, with rapidly evolving technologies, emerging innovative business models and shifting regulatory landscapes.

As the cost of renewables is coming down, in many countries including India, the tipping point where the cost of generation of renewable power is the same as that of new coal-based power plants, has been reached. As the economic growth picks up, the ramping up of renewables in India will accelerate. But the new coal is still needed if the schedulability of renewable power is not achieved. Hence, for deeper decarbonization of the energy sector and to address climate goals to limit temperature rise to 1.5 degrees, schedulable renewables is an imperative for India and many other developing countries. Many policy initiatives to incentivize such new value pools

in the energy system are being envisaged. Further, the possibility of coal demand flattening by 2030; oil and gas by 2035; clean electricity being the dominant form and now available to all at all places and times, sustainable development seems a possibility.

Greenko, from its inception, has been addressing the challenge of powering sustainable development- the scale and extent have changed as it progressed. The size and scale of Greenko, its expertise and access, makes it possible to address the challenge of powering India's growth with clean, reliable and affordable electricity. We are already witnessing that technology changes have made delivery of firm renewable power, in response to demand, has become feasible. Technology can render regulatory clutch irrelevant and cost and scale barriers can be overcome to mainstream renewable energy to other energy end uses. This trend will continue irreversibly and of course, the renewable energy systems and business models would have to transform.

Investors across the globe are excited about the possibility of convergence of trends that could enable India to provide clean, reliable and affordable electricity to power growth and drive deeper decarbonization. Greenko team and its partner ecosystem have geared up to address the new challenges of constructing and operating

Integrated Renewable Energy Projects and Intelligent Energy Platform. The policymakers and regulators have recognized the opportunity and are calibrating the systems to incentivize **#NewEnergyforNewIndia**.

While we are determined to be steadfast in our pursuit of generating and distributing value, we recognize the salience of partnership, as also your views.

**Mahesh Kolli**

President & Joint Managing Director

# UNSDG Contribution

## Goal 3. Ensure healthy lives and promote well-being for all at all ages

Target	Indicator	Contribution/Approach
Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	Coverage of essential health services	Interventions to promote access to quality healthcare by conducting regular health camps has benefited 16,936 people
	Number of people covered by health insurance or a public health system per 1,000 population	Medical insurance coverage to the employee's family including dependent parents at no cost or burden to the employee. A total of 507 medical claims processed.

## Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Target	Indicator	Contribution/Approach
By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by gender	475, School and college tuition fee reimbursements for employee's children and 46, Vocational and Professional higher education fee reimbursements for employees
By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	475 youths' skills were upgraded through training Skill Development Center at Kurnool Solar Park/ Computer Center at Dikchu/ Farmers Training
Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)	4,977 people benefited from Construction of School Infrastructure at Government Schools such as Compound Walls, Boys and Girls Toilets, Midday meal centers, Multipurpose Sheds, drinking water facility etc  3,596 students benefited from Classroom Infrastructure in Govt School such as provision of Benches, Chairs, Uniforms, Play Equipment, Smart Class Systems LED TV & Sound Systems etc
By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States	4.c.1) Proportion of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country	Providing additional skilled teachers to government schools through our interventions to improve quality of education

# UNSDG Contribution

## Goal 5. Achieve gender equality and empower all women and girls

Target	Indicator	Contribution/Approach
Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	Proportion of women in managerial positions	7.2% of the new hires amongst women are offered Mid-Level Management roles. 13.42% have been hired for First Level Management position.

## Goal 6. Ensure availability and sustainable management of water and sanitation for all

Target	Indicator	Contribution/Approach
By 2030, achieve universal and equitable access to safe and affordable drinking water for all	Proportion of population using safely managed drinking water services	1,071 kl of filtered water supplied to communities through RO Plants installation intervention
By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	Construction of toilet facilities for boys and girls in schools has benefitted 1,050 students
By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	Proportion of wastewater safely treated	1,365 kl of wastewater treated and reused for gardening, plantation etc.
By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	Change in water-use efficiency over time	16 rainwater harvesting systems constructed. 86,584 kl of rainwater collected and consumed.

## Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Target	Indicator	Contribution/Approach
By 2030, ensure universal access to affordable, reliable and modern energy services	Proportion of population with access to electricity	2.3 million households have been powered
By 2030, increase substantially the share of renewable energy in the global energy mix	Renewable energy share in the total final energy consumption	4.8 GW of installed capacity

# UNSDG Contribution

## Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target	Indicator	Contribution/Approach
Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status	Zero fatal incidents

## Goal 9. Ensure sustainable consumption and production patterns

Target	Indicator	Contribution/Approach
Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	Number of companies publishing sustainability reports	Publishing sustainability/integrated report annually
By 2030, achieve the sustainable management and efficient use of natural resources	Material footprint, material footprint per capita, and material footprint per GDP	Reduced material consumption

## Goal 10. Take urgent action to combat climate change and its impacts

Target	Indicator	Contribution/Approach
Integrate climate change measures into national policies, strategies and planning	Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production	8 million tons of CO <sub>2</sub> equivalent direct and indirect GHG emissions

## Goal 11. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Target	Indicator	Contribution/Approach
By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	Progress towards sustainable forest management	1) 110,000 trees planted 2) Tree transplantation initiatives taken at operating sites
By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	Biodiversity enhancement programs initiated at 24 sites

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GRI 102-55

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<b>300</b>	<b>Environmental Standards</b>		
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303-1	Water withdrawal by source	117	Natural capital
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GRI Standards	Description	Page No.	Remarks
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304-3	Habitats protected or restored	118	Natural capital
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	NA	
305-1	Direct (Scope 1) GHG emissions	116	Natural capital
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305-4	GHG emissions intensity	116	Natural capital
305-5	Reduction of GHG emissions	116	Natural capital
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402-1	Minimum notice periods regarding operational changes	NA	
403-1	Workers representation in formal joint management-worker health and safety committees	102	Human Capital - Safe, Healthy and Lively Workspace
403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	102	Human Capital - Indicators for Preventive Action
403-3	Workers with high incidence or high risk of diseases related to their occupation	102	Human Capital - Safe, Healthy and Lively Workspace
403-4	Health and safety topics covered in formal agreements with trade unions	102	Human Capital - Safe, Healthy and Lively Workspace

GRI Standards	Description	Page No.	Remarks
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404-3	Percentage of employees receiving regular performance and career development reviews	97	Human Capital - Learning and Development
405-1	Diversity of governance bodies and employees	34, 100	1. Committees of board 2. Human Capital - Diversity
405-2	Ratio of basic salary and remuneration of women to men	NA	
406-1	Incidents of discrimination and corrective actions taken	99	Human Capital - Employee welfare
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	NA	
408-1	Operations and suppliers at significant risk for incidents of child labor	NA	
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	NA	
410-1	Security personnel trained in human rights policies or procedures	103	Greenko Security Services
411-1	Incidents of violations involving rights of indigenous peoples	115	Natural capital
412-1	Operations that have been subject to human rights reviews or impact assessments	115	Natural capital
412-2	Employee training on human rights policies or procedures	97	Human Capital - Learning and Development



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412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	NA	
413-1	Operations with local community engagement, impact assessments, and development programs	110, 115	1. Social and Relationship Capital 2. Natural Capital
413-2	Operations with significant actual and potential negative impacts on local communities	NA	
414-1	New suppliers that were screened using social criteria	107	Social and Relationship capital
414-2	Negative social impacts in the supply chain and actions taken	115	Natural Capital
415-1	Political contributions	NA	
416-1	Assessment of the health and safety impacts of product and service categories	107, 115	1. Social and relationship capital 2. Natural Capital

GRI Standards	Description	Page No.	Remarks
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	107, 115	1. Social and relationship capital 2. Natural Capital
417-1	Requirements for product and service information and labeling	NA	
417-2	Incidents of non-compliance concerning product and service information and labeling	NA	
417-3	Incidents of non-compliance concerning marketing communications	NA	
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	85	Intellectual Capital - Technology Adoption
419-1	Non-compliance with laws and regulations in the social and economic area	40	1. Compliance and Ethics

# List of Acronyms and Abbreviations

ADIA	Abu Dhabi Investment Authority	FDI	Foreign Direct Investment
ALARP	As Low As Reasonably Practicable	FICWA	Institute of Costs and Works Accountants of India
APPC	Average Power Purchase Cost	GAM	Greenko Asset Management
ARI	Acute Respiratory Infection	GBI	Generation Based Incentive
AT&C	Aggregate Technical and Commercial	GEPS	Greenko Energy Project Systems
B2B	Business to Business	GET	Graduate Engineering Trainee
BBS	Behavior Based Safety	GHG	Greenhouse Gas
BES	Battery Energy Storage	GIC	Government of Singapore Investment Corporation
BSE	Bombay Stock Exchange	GIMS	Greenko Integrated Management System
C&P	Contracts and Procurement	GKO	Greenko
CAES	Compressed Air Energy Storage systems	GLMS	Greenko Leave Management System
CAGR	Compound Annual Growth Rate	GMAT	Greenko Meeting and Action Tracker
CAPEX	Capital Expenditure	Gol	Government of India
CCO	Chief Compliance Officer	GRI	Global Reporting Initiative
CCTV	Closed Circuit Television	GROW	Goal Reality Options Way Forward
CDM	Clean Development Mechanism	GS	Golden Standard
CEO	Chief Executive Officer	GW	Gigawatt
CER	Certified Emission Reduction	GWO	Global Wind Organization
CFC	Chlorofluorocarbon	H&S	Health and Safety
CFL	Compact Fluorescent Lamp	HCM	Human Capital Management
CFO	Chief Financial Officer	HEP	Hydro Electric Power
CMM	Contracts and Material Management	HO	Head Office
CO2	Carbon Dioxide	HP	High Pressure
COO	Chief Operating Officer	HR	Human Resource
CSI	Corporate Social Investment	HRMS	Human Resource Management System
CSR	Corporate Social responsibility	HT	High tension
DG	Diesel generator	I/O	Input/output
DISCOM	Distribution Company	ICSI	Institute of Company Secretaries of India
DMS	Document Management System	ICT	Information and Communications Technology
DST	Diagnostic Screening and Treatment	IEA	International Energy Agency
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization	IEX	Indian Energy Exchange
EHS	Environment, Health and safety	IFC	International Finance Corporation
EIRR	Economic Internal Rate of Return	IIRC	International Integrated Reporting Council
ELTP	Entry Level Trainee Program	IMS	Integrated Management System
EPC	Engineering, Procurement and Construction	INR	Indian Rupee
ESIA	Environmental Social Impact Assessment	IoT	Internet of Things
ESMS	Environmental and Social Management System	IRESP	Integrated Renewable Energy Storage Projects
FCAS	Frequency Control Ancillary Services	ISMS	Information Security Management Systems

# List of Acronyms and Abbreviations

ISO	International Organization for Standardization
IT	Information Technology
ITIL	Information Technology Infrastructure Library
JMD	Joint Managing Director
kl	Kilolitre
Km	Kilometer
KPI	Key Performance Indicator
kV	Kilovolt
kWh	Kilowatt-hour
LCOE	Levelized Cost of Energy
LED	Light Emitting Diode
Li-ion	Lithium ion
LP	Low Pressure
LT	Low Tension
M&A	Mergers and Acquisitions
MD	Managing Director
MHU	Mobile Health Unit
MTBF	Mean time Between Failures
MU	Million Unit
MW	Megawatt
NDC	Nationally Determined Contributions
NPA	Non-Performing Asset
NSE	National Stock Exchange
O&M	Operations and Maintenance
OEM	Original Equipment Manufacturer
OHSAS	Occupational Health and Safety Assessment Series
OPC	Open Platform Communications
OPD	Outpatient Department
PAT	Profit After Tax
PHSE	Pumped Hydro Storage System
PLC	Programmable Logic Controllers
PLF	Plant Load Factor
PMC	Project Monitoring Cell
POSH	Prevention of Sexual Harassment at Work
PPA	Power Purchase Agreement
PPS	People, Process and System
PS	Performance Standards
PV	Photo Voltaic

QA	Quality Assurance
QC	Quality Control
QEHS-IS-En-SA	Quality, Environment, Health & Safety, Information Security, Energy and Social Accountability Management Systems
QMS	Quality Management System
R&D	Research and Development
RE	Renewable Energy
REC	Renewable Energy Certificate
RO	Reverse Osmosis
ROCE	Return on Capital Employed
ROE	Return on Equity
RoHS	Restriction of Hazardous Substances Directive
ROI	Return on Investment
SAP	Systems, Applications, and Products
SAT	Site Acceptance tests
SBU	Strategic Business Unit
SCADA	Supervisory Control and Data Acquisition
SF6	Sulphur Hexafluoride
SLDC	State Load Dispatch Center
TDS	Total Dissolved Solids
TNI	Training Needs Identification
TRCM	Trash Rack Cleaning Machine
UAT	Unit Auxiliary Transformer
UDAY	Ujwal Discoms Assurance Yojana
UI	Unscheduled Interchange
UNFCCC	United Nations Framework Convention on Climate Change
UNSDG	United Nations Sustainable Development Goals
UPS	Uninterruptible Power Source
US\$ / USD	United States Dollar
VCS	Verified Carbon Standard
VUCA	Volatility, Uncertainty, Complexity and Ambiguity
WTG	Wind Turbine Generator

