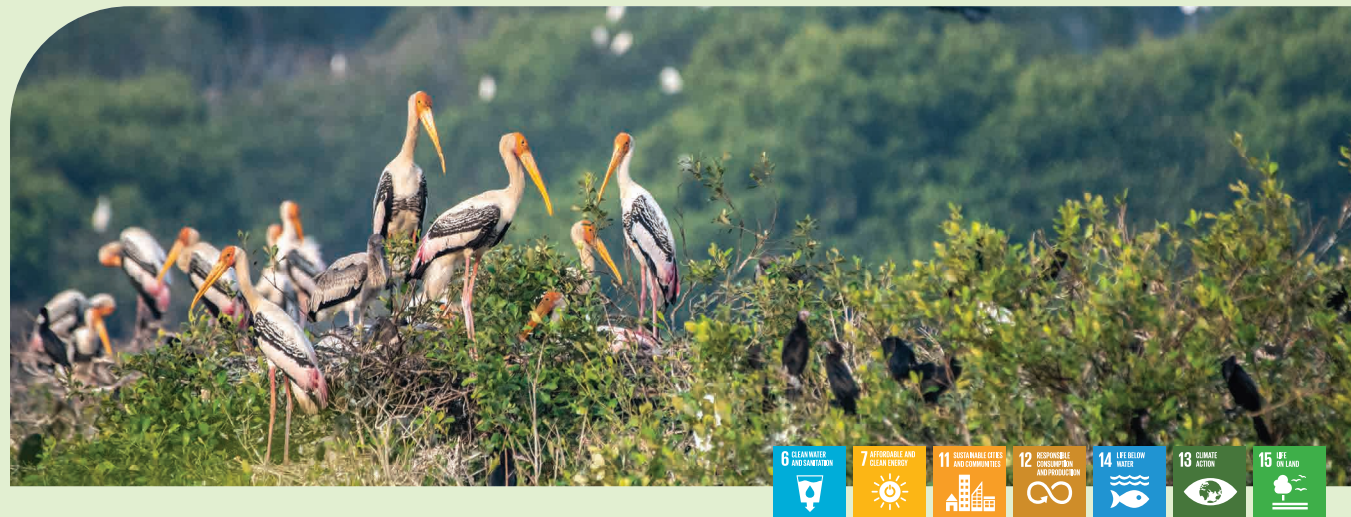


TRANSFORMING THE PLANET

Environmental stewardship is inherent to our operational philosophy and ESG purpose. We are continuously striving towards innovating and reimagining a planet that is healthier and ecologically sustainable.



Our ESG commitments



Achieving net zero carbon by 2050



Sustaining net-water positive impact



Planting 2 million trees by 2030



Protecting and enhancing biodiversity throughout the project lifecycle

Key areas of action

- ▶ Renewable energy projects
- ▶ Exploring opportunities to harness Geothermal Energy by re-purposing hydrocarbon wells
- ▶ Utilisation of flare gas from satellite fields
- ▶ Transition to electric vehicles
- ▶ Nature-based solutions for carbon offsets
- ▶ Carbon capture, utilisation, and/or storage (CCUS or CCS) opportunities
- ▶ Support communities to adapt to the impacts of climate change

- ▶ Reduction in freshwater withdrawal
- ▶ Maximising reuse-recycling rate of trade effluent and domestic sewage
- ▶ Maximising produced water recycling rate
- ▶ Rainwater harvesting and recharge structures
- ▶ Access to safe drinking water

- ▶ Developing carbon sink through mass plantation
- ▶ Plantation of indigenous and native species to support local biodiversity
- ▶ Agro-forestry models involving community farmers to provide livelihood opportunities
- ▶ Protect habitat and restore ecosystem






- ▶ Biodiversity assessment and projects to achieve “No net loss” and strive for “Net positive impact”
- ▶ Supporting wildlife through construction of dedicated drinking water facilities in forest areas
- ▶ Proliferation of native and ecologically sensitive species
- ▶ Protection of endangered species
- ▶ Afforestation/social forestry across locations (incl. offsets)
- ▶ Supporting local communities for biodiversity enhancement through Agro-forestry projects



CLIMATE CHANGE AND ENERGY

We aspire to emerge energy self-sufficient or “aatmanirbhar” by striding steadily on a low-carbon trajectory. We are actively investing in low-carbon technologies, exploring opportunities in Carbon Capture Utilisation and Storage (CCUS), and adopting GHG reduction measures to achieve our targets.

Targets

				
Renewable energy power purchase of 25 MW by 2025 and 45 MW by 2030	Exploring possibilities for harnessing geothermal energy by repurposing hydrocarbon wells	Utilisation of flared gas from satellite fields	Transition of LMV fleet to electric vehicles	Carbon offsetting through nature-based solutions and CCUS (carbon capture, utilisation, and/or storage)

Levers of the decarbonisation process

Renewable energy	Flare gas reduction	Energy efficiency	Carbon sequestration	Electrical mobility	Innovative/new technologies
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| To read more, refer to Cairn Oil & Gas SR (Page 67)

Green OB project

Green OB (operational base) project is our sincere feat at transitioning to green renewable power. The idea is to decarbonise our operational area by utilising the open rooftop area for the installation of solar PVs, to meet the energy requirements.

The project is about installing a 530 kWp solar power plant on the available rooftop area of OB, Mangala Processing Terminal (MPT) covering the living quarters, innovation centre, security building, medical-centre building, and parking area, etc.

This plant will generate ~930MWh of green power per annum which will lead to reduction of 790 tonnes of CO₂e/annum.



Transforming the planet

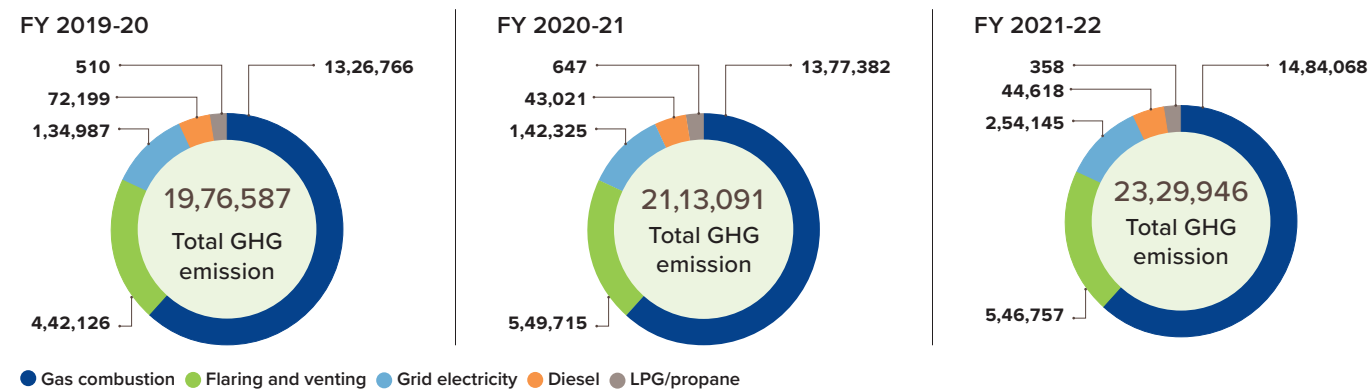
Emissions and energy

The extraction of oil and gas is an energy-intensive process. The primary fuel that powers our operations is associated natural gas, accompanying our extracted oil. With the fields maturing, we need to handle larger quantities of well fluid for producing the same amount of hydrocarbon, resulting in higher energy consumption and GHG emissions.

SCOPE EMISSIONS

Particulars	FY 2021-22	FY 2020-21	FY 2019-20
GHG emissions intensity (Scope 1 & 2) tonnes of CO ₂ e/MT of HC produced	0.256	0.232	0.203
GHG emission Intensity (Scope 1 & 2) (tonnes of CO ₂ e/Gross revenue in ₹ mn)	7.08	11.44	7.73

GHG EMISSIONS (SCOPE 1 & 2)



ENERGY CONSUMPTION

Particulars	FY 2021-22	FY 2020-21	FY 2019-20
Energy consumption within the organisation	2,25,78,186	1,98,40,711	1,93,62,613
Energy consumption outside the organisation	11,58,127	6,24,841	5,92,627
Energy intensity (GJ/MT of HC produced)	2.61	2.24	2.05

[To read more, refer to Cairn Oil & Gas SR \(Page 70-72\)](#)

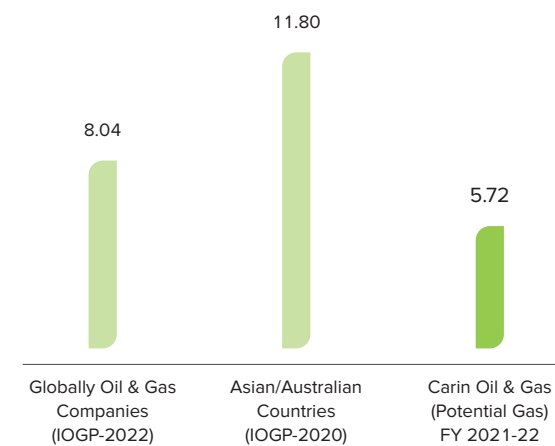
Flaring and venting

We are aware that flaring causes a rise in GHG emissions. So, we are working towards capturing and utilising the gas from satellite fields through bottling and transferring to other distributors. We have planned a pilot of the same at our RJ Gas asset, Kaameshwari WP-02. The success of this pilot will help us minimise flaring from satellite fields and standalone facilities.



FLARING INTENSITY (POTENTIAL GAS)

(Tonnes of gas flared/thousand tonnes of HC production)



[To read more, refer to Cairn Oil & Gas SR \(Page 72-73\)](#)

Particulars	Flaring (mmscm)	GHG emission-flaring (tonnes of CO ₂ e)	Venting (mmscm)	GHG emission-venting (tonnes of CO ₂ e)
FY 2021-22	230.22	5,33,964	0.723	12,793
FY 2020-21	222.31	5,36,174	0.760	13,540
FY 2019-20	174.73	4,28,952	0.744	13,174

Aishwariya & Aishwariya Barmer hill (ABH), which is one of our fields in the RJON 90/1 block, produces non potential associated gas (natural gas with a high CO₂ content of around 85%). The high CO₂ content makes the gas non-utilisable for

power generation. So, it is ultimately flared. Due to the high gas-to-oil ratio of the ABH field, we are observing higher flaring volumes of non potential gas from this reservoir.

GAS FLARING

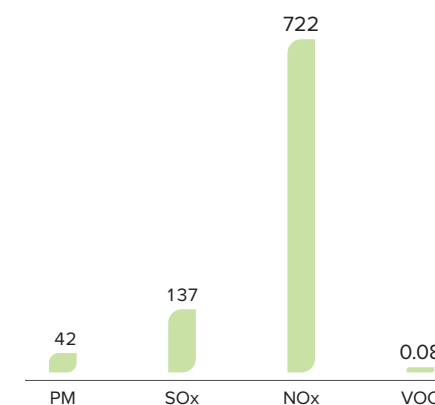
Particulars	Unit	FY 2021-22	FY 2020-21	FY 2019-20
Potential gas flaring	tonnes/day	120.41	193.16	213.04
GHG emission: Potential gas flaring	tonnes of CO ₂ e/ annum	1,57,723	2,51,417	2,66,743
Non-potential gas flaring (Natural gas with high CO ₂ content around 85%)	tonnes/day	618.11	485.88	293.71
GHG emission: Non-potential gas flaring (Natural gas with high CO ₂ content around 85%)	tonnes of CO ₂ e/ annum	3,76,240	2,84,758	1,62,210




AIR QUALITY AND STACK EMISSIONS

STACK EMISSIONS IN FY 2021-22


Emission value (MT/annum)




Mitigation




Utilising cleaner fuel




Installing vapour recovery systems



Adequate stack height and CEMS



Preventive maintenance programme



Fugitive emission control

[To read more, refer to Cairn Oil & Gas SR \(Page 75\)](#)

Transforming the planet



WATER

As most of our operations are in regions with scarcity of portable water, effective water sourcing and utilisation are crucial for the uninterrupted functioning of our operations



Targets



Maximising water reuse and recycling to >80% by 2025



Increasing produced water recycling to >97% by 2025



Developing 300+ structures by 2025 in Barmer district to enable harvesting of 3 mn kL of rainwater annually

96%

Of produced water is treated and re-injected into the reservoir

~32,250 kld

Water extracted, of which 99% is from saline water sources

75%

Water reuse / recycling rate

WATER WITHDRAWAL AND CONSUMPTION (kL)

Particulars	FY 2021-22	FY 2020-21	FY 2019-20
Water Withdrawal (A)			
Ground water	1,16,05,301	1,06,19,818	1,09,87,439
Surface water (River)- PHED	46,468	49,878	26,006
Water tankers (third party supply)	1,11,259	79,858	1,01,068
Produced water generated	4,07,75,601	4,05,64,902	37,451,655
Mineral water purchased (B)	10,153	8,246	7,960
Water consumption: Withdrawal (A) + Mineral water purchased (B)	5,25,48,782	5,13,22,702	4,85,74,128

Cairn is a net-water positive

We have been declared as net-water positive with a NPWI (Net Positive Water Impact) index of 1.12, as per the recent water impact assessment carried out across all our assets.

Additionally, four of our sites have been individually declared as Net Water Positive Assets:

RJ Oil (MBA Operations)	RJ Gas	Midstream Operations	Ravva
NPWI 01.08	NPWI 03.95	NPWI 18.56	NPWI 01.04



VOLUME AND DISPOSAL OF FORMATION OR PRODUCED WATER (kL)

Particulars	FY 2021-22	FY 2020-21	FY 2019-20
Produced water generated	4,07,75,601	4,05,64,902	3,74,51,655
Produced water recycling rate	96.1%	96.8%	95.6%

OVERALL WATER REUSE-RECYCLING RATE

Particulars	FY 2021-22	FY 2020-21	FY 2019-20
Reuse-recycling rate	75%	77%	75%

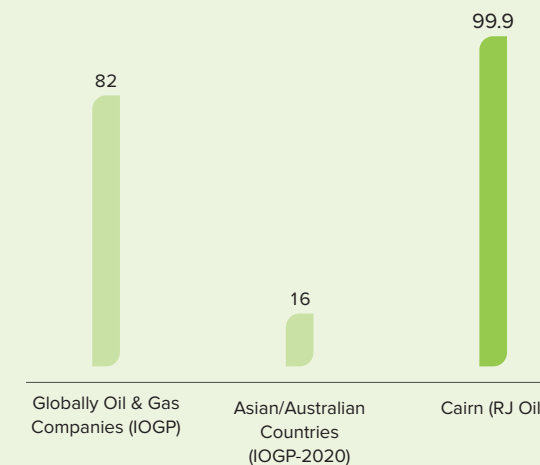
Recycling of produced water for injection purposes

We recycled 3,73,79,838 kL of produced water in RJ Oil in FY 2021-22, by reinjecting into the reservoir for void replacement, which would have otherwise required groundwater sourced from saline aquifer 'Thumbli'.

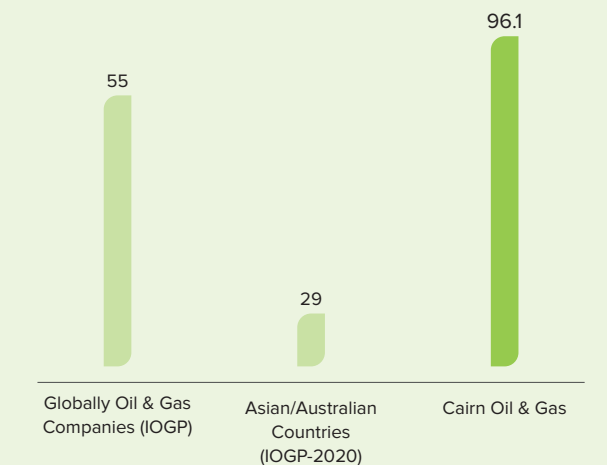
To increase produced water recycling, we have installed and commissioned stage II and stage III ETP for treatment of reject stream of produced water filter backwash.

In RJ Oil, produced water recycling rate has risen to 99.9%, which is higher than the IOGP benchmark, with continuous improvement and installation of additional injection filter system.

PRODUCED WATER REINJECTION (Onshore %)



OVERALL PRODUCED WATER REINJECTION



Benchmarking with IOGP 2020 (IOGP Environmental performance indicators - 2020 data), report released in Feb 2022.

As a part of sustainability initiatives, we also monitor the effectiveness of our existing operations and take up new projects to optimise our water usage. As part of our CSR programmes, we have desilted 27 Nadis, constructing around 800 Khadins and Tankas, established rooftop rainwater harvesting systems at 40 government schools across Barmer, thereby creating a total rainwater harvesting potential of ~1.72 million m3 per annum in the community area.

| To read more, refer to Cairn Oil & Gas SR (Page76-80)

Transforming the planet



WASTE MANAGEMENT AND CIRCULAR ECONOMY

We have developed a standard procedure to effectively manage waste in line with principles of waste hierarchy. We have a ‘Zero Waste, Zero Discharge’ philosophy. Our lifecycle approach in managing waste and disposal considers the cradle-to-grave environmental impact associated with our operations.

HAZARDOUS WASTE GENERATED (MT)

Particulars	FY 2021-22	FY 2020-21	FY 2019-20
Waste generated	25,777	24,729	47,700
Waste diverted from disposal (gainful utilisation)	20,642	21,628	43,240
Waste directed to co-processing for energy recovery	3,376	2,973	4,256
Waste directed to disposal (landfill and incinerator)	1,666	57	124

~85,000 MT of hazardous waste had been sent to cement industries for co-processing to utilize as an alternate fuel or raw material

In line with our commitment to reducing waste generation and gainfully utilising waste, we have developed an in-house facility for the collection, storage for sediment removal, heating, and pumping of skimmed oil back into the process through the off-spec tank at the Mangala processing terminal.

Through our continuous efforts, we have recovered 19,303 bbls of slop oil in the last 18 months. This is a milestone in achieving our zero waste to landfill vision.



BIODIVERSITY

To mitigate the impact of fugitive emission, we are developing peripheral greenbelt by planting large quantities of local species in phases. As per the study conducted by an independent third-party in 2018, the carbon sequestration potential of our plantations is ~42,000 tonnes of CO2 equivalent.

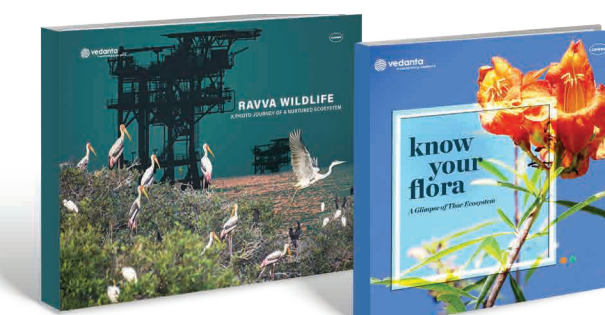
Targets

<p>Plantation of 2 million trees by 2030</p>	<p>Revival of Khejari in the Thar Ecosystem with 15,000 plants by 2025</p>	<p>Proliferating globally endangered guggal in RJON block, Barmer, with 1,500 plants by 2025</p>	<p>Reclamation of mangroves in offshore areas</p>	<p>Conservation of an endangered species - the Fishing Cat - in Godavari delta region</p>
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Boosting biodiversity at Ravva (A nurtured ecosystem of mangroves)

Transformation over the years

<p>Early 2000 - Swampy land</p>	<p>Mangrove Nursery during 2001-2002</p>	<p>Fishbone canals made for Mangroves 2002</p>
<p>2009</p>	<p>2006</p>	<p>Mangrove Plantation 2003</p>
<p>2015</p>	<p>2019</p>	<p>2022</p>



Ravva Wildlife – A photo journey of a nurtured ecosystem
To learn more, refer to https://efinder.cairnindia.com/SiteAssets/Ravva_Wildlife_Video.mp4

Know Your Flora – A Glimpse of Thar Ecosystem
To learn more, refer to <https://heyzine.com/flip-book/477f6bf623.html>

All our units are ISO 14001:2015 (Environmental Management System) certified.

| To read more, refer to Cairn Oil & Gas SR (Page 86-92)