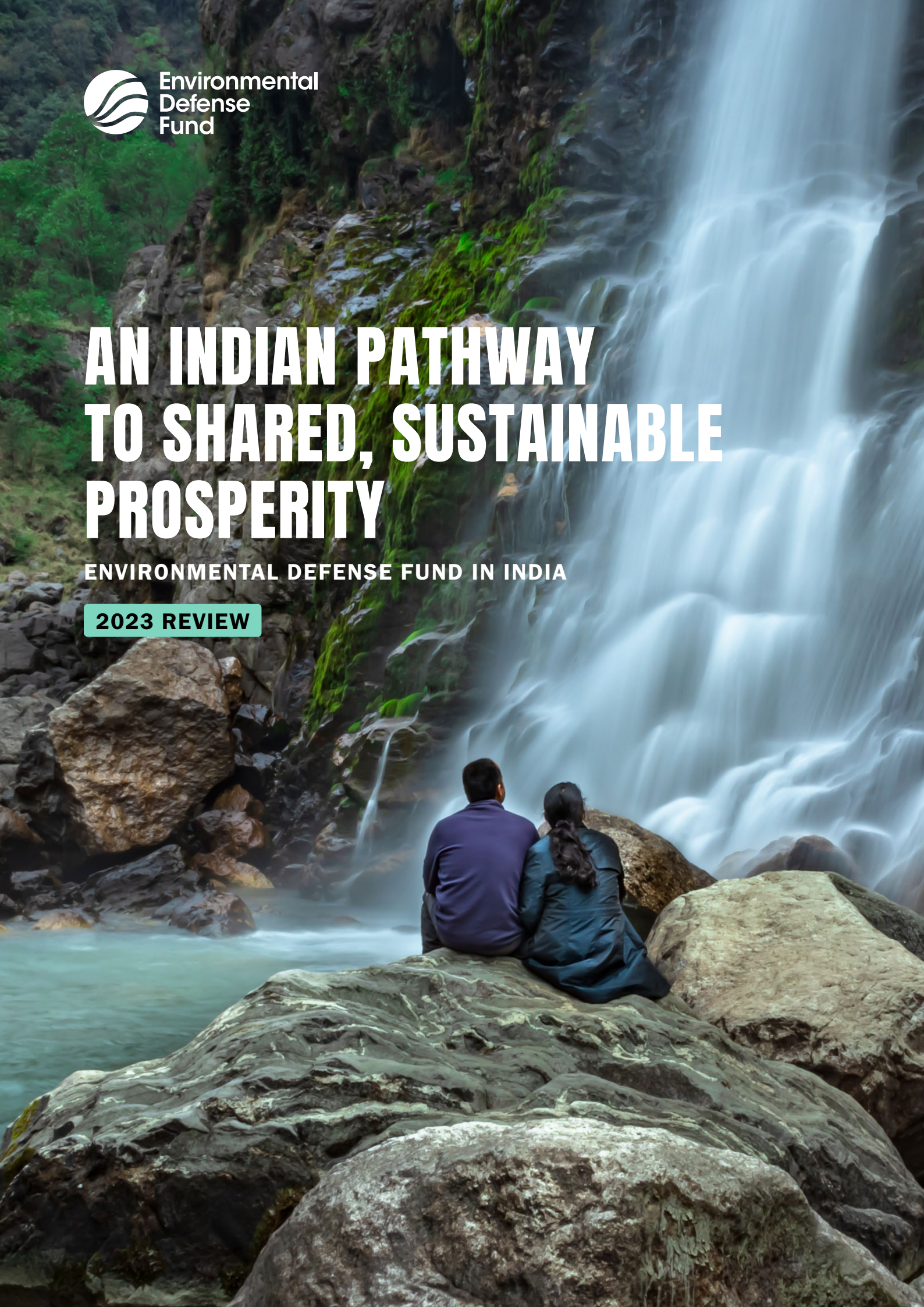


AN INDIAN PATHWAY TO SHARED, SUSTAINABLE PROSPERITY

ENVIRONMENTAL DEFENSE FUND IN INDIA

2023 REVIEW



AN INDIAN PATHWAY TO SHARED, SUSTAINABLE PROSPERITY

Environmental Defense Fund in India: 2023 Review

India is the most populous country in the world and is poised to become a \$5 trillion economy — the world's third largest — in the next five years. Today, India's per capita greenhouse gas emissions are about one tenth of those from the United States, and India represents just 3.4% of historic global emissions. Ambitious growth is of paramount importance for India, but the nation is also acutely aware that its emissions cannot grow proportionately with its economy. Therefore, India has a bold vision to become the first major economy to industrialise without carbonising. This will require a concerted effort from the public and private sector. Environmental Defense Fund (EDF) aims to help catalyse this action — working as an authentic and distinctive partner to India by sharing our scientific and economic expertise and by amplifying our partners' capabilities on the ground.

This builds on exciting momentum in India, which is at the forefront of the global race to the top for climate action with major advances emerging across a number of sectors. For example, last year 1.5 million electric vehicles were sold in the country and high efficiency lights and ceiling fans are a large and growing market.

India has the potential to realise both a strategic advantage and a green bonus through sustainable infrastructure, responsible business and cleaner technology. Domestic renewable energy reduces costs, emissions and geopolitical risk.

Across different sectors, EDF's efforts are aligned to support the country's economic development — while stabilising the climate and providing a healthy environment. Our approach provides catalytic support in four distinct strategic areas. These include: (1) enhancing **sustainable livelihoods** in agriculture, livestock and fisheries to achieve the triple win of improved incomes, secured yields and protected climate; (2) advancing **corporate action** to generate shareholder value through sustainable business operations; (3) supporting **government capacity** in areas like carbon pricing; and (4) helping India **balance economic growth and environmental sustainability** imperatives.

As you will see in this report, 2023 was a pivotal year for impact in India. We made significant progress in building our foundation of partners and the portfolio of activities that are delivering impact across these four themes.

We also received validation of our work at the highest levels. The Ministry of Power's Bureau of Energy Efficiency requested EDF's expert comments on the design of the India Carbon Market, with the goal of developing a robust market that is well placed to support Indian businesses and reduce carbon emissions. At the request of the state government of Tamil Nadu, EDF is developing a roadmap for climate-resilient dairy production to boost cattle productivity and farmer incomes while bolstering food security. And the Deputy Chief Minister of Maharashtra has endorsed our climate-smart agriculture and fisheries work — a sign that the government sees the value of EDF's work in these areas.

We look forward to 2024 with ambitions to continue to scale our impact, knowing that we build upon a strong foundation. We are grateful, as ever, to our friends, partners and supporters who make our work possible. I hope you will be proud of the work that you enabled in 2023.



Hisham Mundol
Chief Advisor, India
Environmental Defense Fund



INDIA DOMESTIC EV MARKET¹

2023 **\$2.0**
billion US

2025 **\$7.1**
billion US

INDUSTRY ESTIMATES
FORECAST

10
million
annual sales
by 2030



49%
compound annual
growth rate
2022 to 2030



INDIA LED LIGHT MARKET²

2022 **\$4.4**
billion US

2030 **\$19**
billion US

20% ANNUAL INCREASE



2.4
billion LED lights
sold as of
March 2022



75%
of India's
market share
are LED lights

¹Source: [EV Sector in India; India Briefing; February 5, 2024](#)

²Source: [Why India's LED Revolution is a Case Study in Energy Market Transformation; Indiatimes.com](#)



[Mangroves offer a vital shield against climate change](#)
Hisham Mundol, Nikhil Goveas

ENHANCING SUSTAINABLE LIVELIHOODS

Variations in temperature and weather conditions have a significant impact on crop, livestock and fishing productivity. As a result, climate change poses a significant threat to Indian food systems — and to the livelihoods of hundreds of millions of Indian citizens. Nearly half of India — 700 million people — depends on the agriculture, livestock and fisheries economy. At the same time, food systems produce a significant amount of climate pollution (about [one-third](#) of global greenhouse gas emissions), which only exacerbates the climate crisis. In the face of these challenges, farmers must work harder to sustain yields, fishers spend more effort and travel farther for a smaller catch, and they all face worsening business and environmental impacts.

Our philosophy is to adopt a farmer first approach — with the goal of increasing incomes, supporting yields and securing climate benefits. With our partners, EDF has launched and scaled programmes that provide farmers and fishers with tools and expertise to overcome these challenges and deliver a triple win for livelihoods, food security and the climate.

2023 Results



Equipped 40,000 farmers with a new tool to manage nitrogen fertiliser use — and save costs.

Nitrogen is essential to crop production, but too little reduces crop yields and depletes soils, and too much accelerates climate change, degrades air and water quality, and increases costs for both farmers and governments. EDF created the [N-Balance tool](#) to help farmers and food companies estimate fertiliser requirements and analyse farming practices to determine how much fertiliser is efficiently needed on a given plot. N-Balance can help farmers save ₹500–2,500 (about US\$6–30) per agricultural season for households whose average monthly [income](#) is approximately ₹10,000 (about US\$120). In 2023, EDF worked with Samagra Shikshan Evam Vikas Sansthan in Bihar and Syngenta Foundation India in Maharashtra to pilot this tool. We expect these pilots to not only reduce farmers' costs and optimise government spends, but also encourage other farmers and organisations to adopt the tool in different states.



Formalised partnerships with local partners to support marine ecosystems and improve fishers' yields in Maharashtra and Tamil Nadu.

India is the second largest seafood producer in the world. However, sustainable fishing practices are not employed at scale because conservation efforts to protect fish populations do not offer short-term economic benefits for fishers. We have built relationships with Dakshin Foundation and the M. S. Swaminathan Research Foundation to improve fisheries management by strengthening community and government capacity to support climate-resilient fisheries. EDF carried out research on fishery and ecosystem health and resilience and examined opportunities to strengthen markets and supply chains in a manner that can demonstrate the real-world value of sustainable fisheries. We intend to launch a pilot in Tamil Nadu and Maharashtra in 2024 where we will support officials, local experts and fishing communities to implement co-management plans that reduce spoilage and fisheries waste, optimise operations through better technology, and ensure that regulations benefit ecological systems and fishers' livelihoods.



INDIA'S CLIMATE COMMITMENTS (2015-22)¹

Item	National Statement at UNSDS (2015)	2016 NDC	National Statement at COP26 (2021)	2022 NDC
Renewable energy generation capacity	175 GW by 2022		50% energy requirement by 2030	
Emissions intensity with respect to GDP relative to 2005		30–35% by 2030	45% by 2030	45% by 2030
Non-fossil-fuel-based electricity generation capacity		40% by 2030	500 GW by 2030	50% by 2030
Additional carbon sink through forestry		2.5–3 billion metric tons of CO ₂ equivalent		2.5–3 billion metric tons of CO ₂ equivalent
Net zero goal			Net zero by 2070	

¹Source: National Statement in the United Nations Sustainable Development Summit (2015) and Nationally Determined Commitments (2016–22).



The missing part of the jigsaw
Hisham Mundol

ADVANCING CORPORATE CLIMATE ACTION

Climate change is both the environmental crisis and economic opportunity of the century. By adopting sustainable business practices, companies have a significant opportunity to create shareholder value — though achieving this requires authentic, ambitious and concerted action by the corporate sector. EDF works directly with corporate partners to develop and implement programmes that embed sustainable practices and improve bottom lines for companies and workers and yield benefits for the environment and climate.

Capital and technology remain significant barriers. However, as awareness and interest in green technologies and business practices rapidly increase in India, a significant gap in green talent is also emerging. EDF's Climate Corps programme is helping to address this challenge by cultivating the next generation of climate leadership in India. By recruiting, training and embedding post-graduate students in leading companies and organisations, the programme seeks to support businesses' efforts to meet India's development and climate objectives and develop a pipeline of talented professionals equipped with knowledge and skills that will be essential in India's [growing green economy](#).

2023 Results



Placed nearly 30 Climate Corps fellows at 13 large national and multinational corporations to support sustainability and environmental projects. In the largest Climate Corps cohort in India to date, fellows were placed at top companies including Larsen & Toubro, Tata Steel, Zomato and others. **Younus Sheikh** worked with JSW Cement to build a business case for using bio-methane as an alternative to coal for cement production, which could potentially reduce the firm's carbon dioxide emissions by an additional 30% beyond their existing sustainability goals. **Devyani Pudale's** work informed Larson and Toubro's Climate Change Transition Plan by establishing Internal Carbon Pricing as a framework to assess their impact, justify the capital investments and prepare for future requirements.



Built partnerships with dairy companies such as Gokul, Aavin and ABT Dairy to help increase farmers' incomes, improve nutrition security and bend the curve on dairy sector emissions. Because dairy is the [second largest source of protein](#) for Indians, and there is significant potential to improve productivity in the sector, these partnerships aim to incentivise more resilient corporate livestock and dairy management practices. EDF has been developing climate-resilient dairy programmes to help farmers adapt to the impacts of climate change while also mitigating greenhouse gas emissions, which will launch in collaboration with dairy companies in Maharashtra and Tamil Nadu in 2024. The projects will focus on improvements in feed and fodder management, better animal health and breeding services, and a network of trained professionals that offer effective and actionable advice to farmers.



Began a study with [Toxics Link](#) on the use of some chemicals in India to chart a path for better chemical management. Specifically, we are supporting research on [nonylphenol and nonylphenol ethoxylate](#), which continue to be used in a number of industries. These chemicals are endocrine disruptors that are toxic to humans and aquatic animals and can be especially harmful to immune and reproductive systems. Through this study, EDF aims to build scientific knowledge and an economic case for safer chemical management which could eventually facilitate the adoption of a broader chemical management protocol in the country.



[CSIR-NEERI plans grid-based strategy to combat Delhi's air pollution](#)

SUPPORTING GOVERNMENT CAPACITY

India's national and local governments have enormous ambitions to improve the lives of citizens by boosting renewable energy, reducing climate pollution and supporting vulnerable populations including farmers and fishers. Additional capacity — in the form of complementary technical expertise, new tools and improved data — can help augment government leadership and accelerate results.

EDF is working as an authentic partner for governments in India, pulling from our deep expertise in areas that align with national priorities, such as informing the design of India's carbon market, improving air quality and supporting renewable energy deployment.

2023 Results



Provided expert feedback on draft policies to inform the design of India's rapidly developing carbon market. India publicly announced the formation of its first domestic, regulated carbon market in 2023. The government requested EDF's confidential advice in the early stages of the market's conceptualisation because of our long track record of support for developing carbon markets in the United States and China, along with our reputation for results in India. EDF conducted research on critical building blocks of the carbon market and helped shape policies that guide the market's development. Our goal is to ensure that the Indian Carbon Market generates a high-quality carbon trading ecosystem that provides accountability and incentives to drive emissions reductions in line with India's goals.



Developed tools to identify local sources of air pollution, which enable more targeted government action. The Local Air Management Plan (LAMP) initiative uses hyper-local sensors in eight cities across India to gather and analyse street-level pollution sources so local authorities can better direct their efforts to make improvements. This programme received recognition on the national stage, as the chief scientist with the National Environmental Engineering Research Institute presented LAMP at the India Clean Air Summit in a speech that gained [media attention](#). Dewas city formally adopted LAMP as its primary method for achieving citywide air quality improvements mandated by the central government's National Clean Air Programme.



Expanded efforts to build technical expertise and advance data-driven solutions for air pollution in Indore. [Clean Air Catalyst](#), a global consortium co-led by EDF, installed three new air quality monitoring stations and trained over 1,000 people on the sources and solutions to pollution, including 160 traffic police officers and an all-women team of community health workers. Because accurate data is the first step in addressing pollution, new monitoring capacity and increased awareness will help guide officials' efforts to improve the city's air quality.



Launched an open source [energy modelling tool](#) to support a low carbon transition for the electricity sector. In collaboration with researchers at Jadavpur University and the Indian Institute of Science, EDF launched the [Indian Zero Carbon Energy Pathways](#) tool for government, research groups and industry to explore energy transition scenarios. This model is contextualised to India, transparent, independent and free-to-use, which can help these stakeholders make informed decisions for sustainable and decarbonised energy systems in India.



BALANCING ECONOMIC GROWTH AND ENVIRONMENTAL SUSTAINABILITY

India plans to nearly double its economy by 2030, lift hundreds of millions out of poverty and improve middle class incomes, all while working to peak its emissions by 2040 and reach net zero carbon emissions by 2070. To achieve these goals, a vision is emerging that has never before been achieved by a major economy: **industrialising without carbonising.**

The [challenges associated with this vision](#) are enormous, but so are the opportunities. For example, cement is one of the most energy-intensive products on the planet with a massive carbon footprint, but cement produced in India is among the greenest in the world. And India's construction industry is expected to reach \$1 trillion by 2030, up from \$650 billion in 2023.

Finding ways to help align India's economic and environmental imperatives is at the heart of EDF's partnership approach. This strategy informs all of our efforts to enhance sustainable livelihoods for farmers and fishers, to strengthen the private sector's capacity and ambitions to drive climate action, and to complement the government's efforts to improve people's lives.

2023 Results



Played an important role in the development of the Oil and Gas Decarbonisation Charter, which was signed by India's Oil and Natural Gas Corporation (ONGC) and announced at COP28 in Dubai. The COP Presidency announced that 50 companies responsible for 40% of global oil production, including ONGC, agreed to virtually eliminate their methane emissions — a potent climate pollutant that is responsible for up to a third of current warming. EDF advocated for the engagement of companies in this charter and made sure it included mandatory monitoring by an independent third party. Because national oil companies from low- and middle-income countries face unique technical and financial obstacles to establishing methane mitigation, EDF is building upon the charter's momentum as a partner in a new industry-led, industry-funded technical support network that will help build internal capacity at these energy companies to assess their emissions and flaring problems, stand up mitigation programmes and projects, and manage their emissions independently over time.



Highlighted the need for equity in carbon pricing efforts — both globally and within a given country — to support countries' growth priorities and climate action. India is a rapidly industrialising global leader and is working to ensure that carbon pricing provides accountability to incentivise clean growth. Therefore, EDF conducted a [study](#) with the Observer Research Foundation to evaluate carbon pricing efforts in industrialised and emerging economies. Our report further emphasised gaps that we are seeing, particularly in low- and middle-income countries that are exploring carbon pricing. For example, we stress a need to build capacity within institutions that design, build, run and review effective carbon pricing mechanisms like carbon markets. We shared our findings with high-level G20 and COP28 delegates and the report was launched publicly in March 2024.



PLANS FOR 2024

EDF will continue to provide authentic, distinctive and catalytic support to India to bolster local efforts to improve people's livelihoods and the environment. We have built a strong foundation in 2023 and will expand our impact in the coming year across our strategic priorities.



Enhancing Sustainable Livelihoods

We will support livelihoods for those working in the agriculture, livestock and fisheries economy by:

- **Demonstrating solutions for small holder dairy systems** by supporting productivity optimisation programmes with milk companies and dairy cooperatives in Tamil Nadu and Maharashtra, developing a curriculum and training programme that can scale best practices and providing technical and catalytic support for government departments on dairy and livestock policies and programmes;
- **Implementing and scaling low-carbon solutions for Indian agriculture** by working with agriculture universities, ag-tech companies and implementation partners to support fertiliser optimisation programmes in Bihar and Maharashtra, refine our N-balance tool for new crops, develop a greater evidence base on the benefits of fertiliser optimisation and support government departments on fertiliser and soil health policies and programmes;
- **Developing a low-cost, scalable and effective monitoring and evaluation toolbox**, based on research across three states, that will help state governments, NGOs and research organisations develop impactful surface and groundwater management programmes.



Advancing Corporate Climate Action

We will enhance corporate climate progress by:

- **Embedding Climate Corps into additional strategic sectors** like freight and logistics, food and agriculture, and manufacturing;
- **Raising awareness of the sustainability talent gap** in India through strategic communications.



Supporting Government Capacity

We will complement the Indian government's climate leadership by:

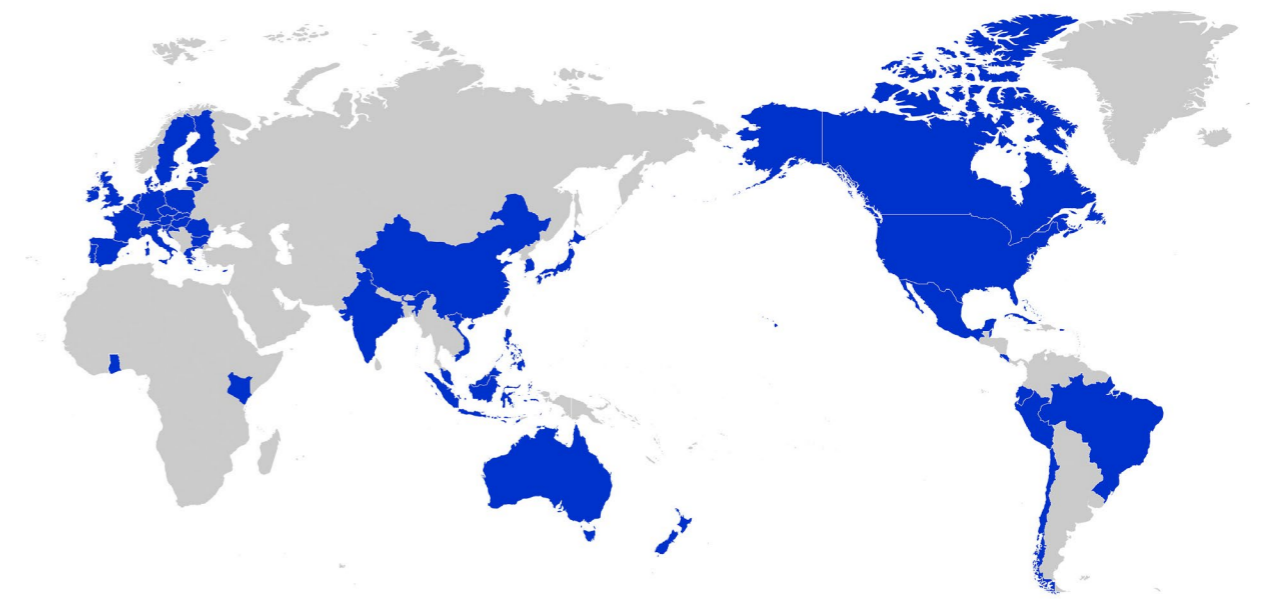
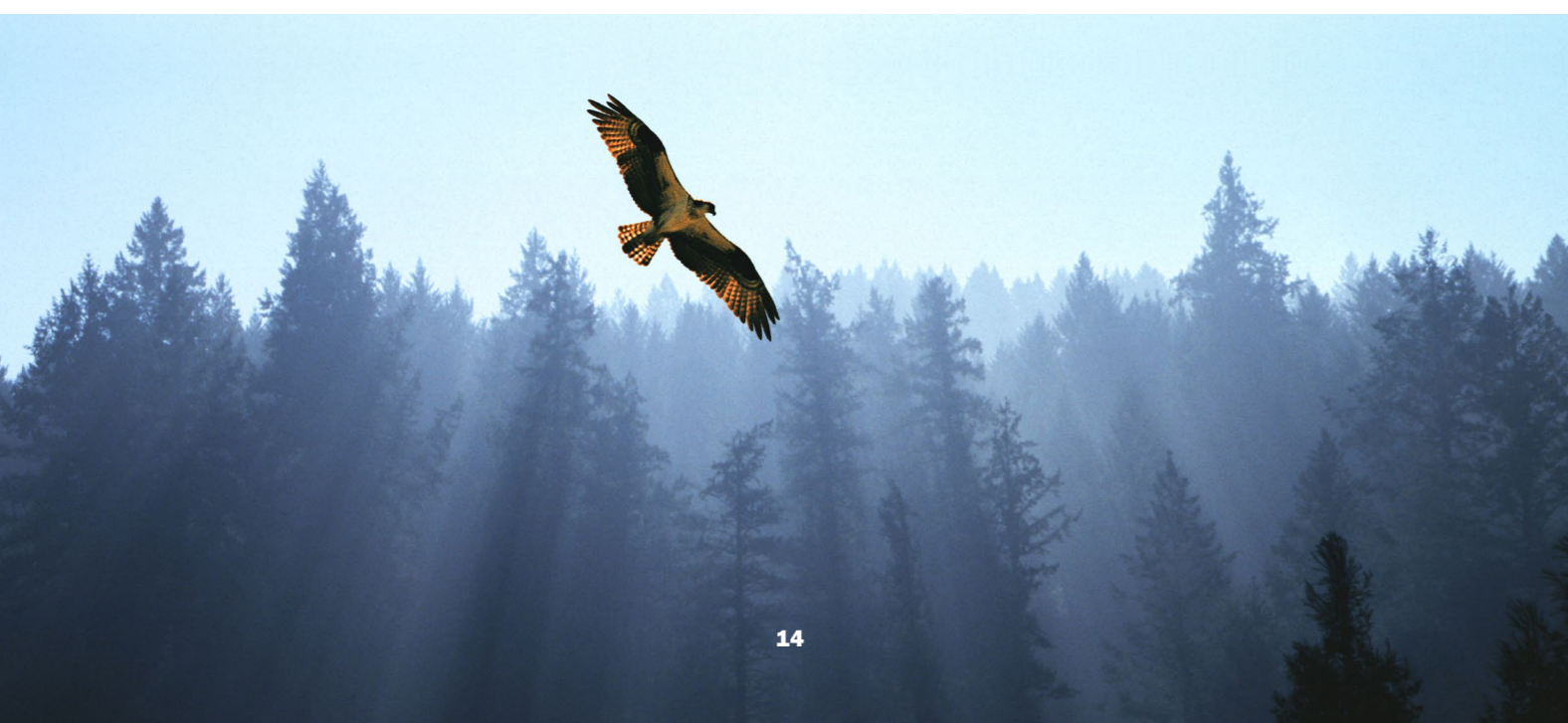
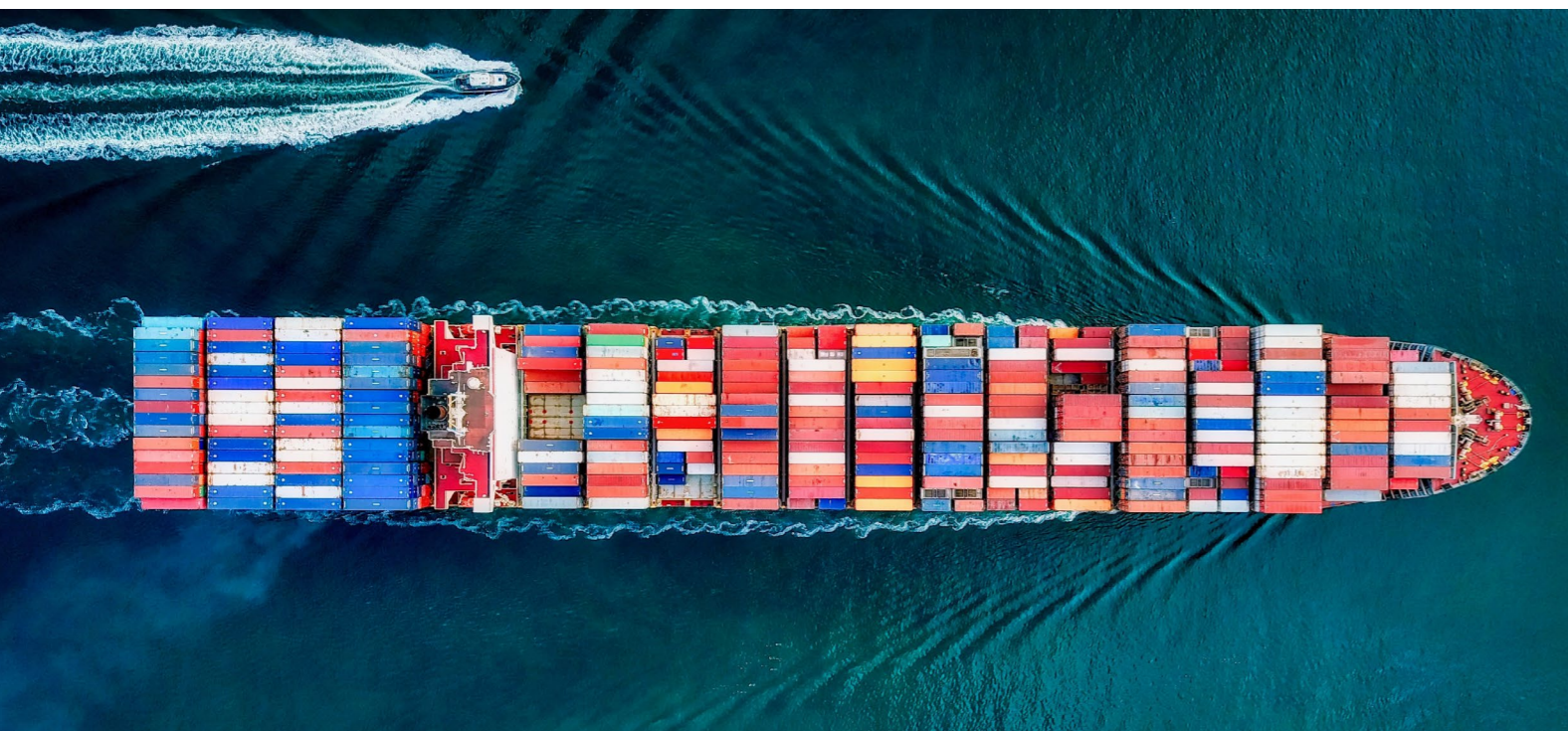
- **Continuing to advise the government on the Indian Carbon Market framework;**
- **Conducting policy and modelling studies** on central issues related to the market, which can further enhance the government's capacity to design and implement an effective carbon market in India.



Balancing Economic Growth and Environmental Sustainability

We will support strong alignment between India's economic and climate goals by:

- **Catalysing the climate tech ecosystem** in India with an emphasis on critical sectors like agriculture and food systems, freight and logistics, and manufacturing;
- **Building deeper partnerships** between government, industry and research organisations.



EDF'S GLOBAL IMPACT

Environmental Defense Fund is sharply focused on addressing the climate crisis and achieving our vision of a vital Earth for everyone.

We work with a wide array of partners and allies worldwide to spark innovative solutions to stabilise the climate, strengthen the ability of people and nature to thrive, and support people's health. We operate in more than 30 countries and territories and our efforts largely focus on four geographies which, together, produce about [half of the world's climate pollution](#): Europe, India, China and the United States. In addition to India, a snapshot of our global impact and priorities include:

China

We supported China in establishing the world's largest carbon market in 2021. We have now identified a comprehensive roadmap for China to dramatically reduce emissions by 2035 and are working to make this a reality. We do this by helping partners enhance market mechanisms and promote low-carbon technologies that can avoid millions of tons of carbon emissions.

Europe

In 2023 we supported the EU as it adopted a first-of-its-kind regulation on methane, which reigns in emissions within and outside the bloc's borders. Our work in Europe aims to bridge the science to policy gap to achieve ambitious environmental goals. We focus on key priorities like getting hydrogen right, reducing methane emissions and finding ways to cut climate pollution from transportation.

United States

EDF got its start in the U.S. over 50 years ago and continues to drive public and private sector climate action through an expansive programme of work. In 2022, we played a leading role in helping to secure the historic Inflation Reduction Act, which unlocks billions of dollars of climate investments. We have also worked with top companies to secure ambitious commitments — and actions — that benefit the climate. With EDF's support, Walmart committed to removing one billion tons of greenhouse gas emissions from its global supply chain by 2030 — a goal it achieved [six years earlier than expected](#).



[EDF in India](#)

