

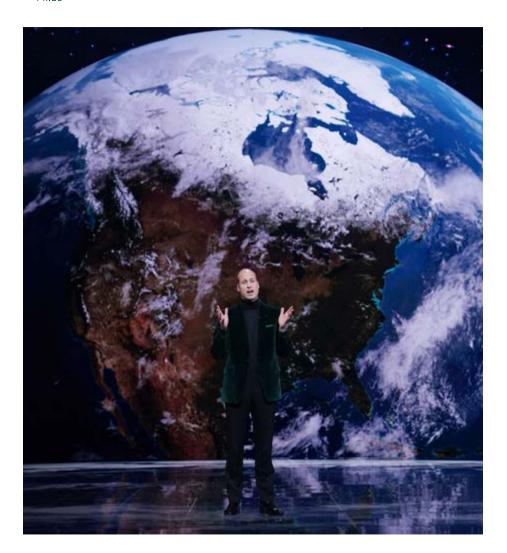
- 1 INTRODUCTION .
  2 FIVE EARTHSHOTS
- \* AREAS OF INTEREST
- NATURE L
- <sup>05</sup> AIR
- ° OCEANS

- WASTE-FREE
- \*\* CLIMATE
- \*ENABLERS AND FILTERS
- THE WORLD WE CHOOSE

07 WASTE



INTRODUCTION 4



### THE EARTHSHOT PRIZE IS A PLATFORM DEDICATED TO FINDING AND GROWING SOLUTIONS THAT WILL REPAIR OUR PLANET THIS DECADE.

We wake up every day to support innovators and leaders working to create a better world. They may be a university, a charity, a tech startup or even a city.

Our role is to shine a spotlight on their solutions, to support and help scale them, and in doing so, unleash the urgent optimism in each of us.

Inspired by President John F. Kennedy's Moonshot, which united millions of people around the goal of reaching the moon, The Earthshot Prize was founded by Prince William to find and grow the solutions that will repair our planet this decade.

EACH YEAR WE SEARCH FOR INNOVATIVE SOLUTIONS TO FIVE DIFFERENT BUT CONNECTED EARTHSHOT CHALLENGES:







PROTECT AND RESTORE

CLEAN OUR

REVIVE OUR OCEANS







FIX OUR CLIMATE

### INTRODUCTION



Working alongside our network of 370 Official Nominators from 67 countries, we scour the globe for breakthrough solutions that can solve these environmental challenges. The Earthshot Prize's Nominators are selected for their ability to identify the most impactful solutions to the Earthshots.

Our Roadmap is the beginning of this search process. In producing it we have sought the knowledge of 40 global environmental experts and reviewed over 70 scientific publications. This has grounded our search in the latest science and given us a unique view on where we need to focus our search process.

The Roadmap acts as a guide to our Official Nominators in their search for solutions over the coming years. It is a sketch of the world in front of us, and illustrates areas of opportunity and possibility that solutions can unlock.

We hope it is also a roadmap for each

of us to consider where and how we can contribute. Each day, members of the public ask us how they can help. Our answer is simple. We encourage you to consider the role you can play in our collective effort, helping us focus on the 15 priority areas outlined in this document. Each one of us, regardless of background, expertise, or sphere of influence, can make a difference.

If you are a Nominator and want to download or share the full 2023 Roadmap, please click here













We choose to ensure that, for the first time in human history, the natural world is growing – not shrinking – on our planet



### CLEAN OUR

We choose to ensure that everyone in the world breathes clean, healthy air - at World Health Organisation standard or better



### REVIVE OUR OCEANS

We choose to repair and preserve our oceans for future generations



### BUILD A WASTE-FREE WORLD

We choose to build a world where nothing goes to waste, where the leftovers of one process become the raw materials of the next - just like they do in nature



### FIX OUR CLIMATE

We choose to fix the world's climate by cutting out carbon: building a carbon-neutral economy that lets every culture, community and country thrive

05 AIR



### **EACH EARTHSHOT IS** ITSELF A BOLD AMBITION, **REQUIRING GLOBAL CHANGE FROM ALL** PARTS OF SOCIETY.

To give The Earthshot Prize and its network it's maximum chance of success requires prioritisation. To provide this focus, we have identified three areas of interest within each Farthshot based on questions we asked ourselves, the experts and all others who contributed to this report.

These fifteen areas of interest are all areas where there is the potential to see damaging and unsustainable practices rapidly replaced with high impact solutions. Whilst our focus is on these areas, we also accept any entry outside this as long as it has the potential for global impact in the next few years.

### FIFTEEN AREAS OF INTEREST.



### **PROTECT** AND RESTORE NATURE



- Restoring damaged ecosystems
- Feeding people while protecting nature



### **CLEAN OUR**

- Engaging citizens in data collection and clean air policies
- Preventing the burning of fields, forests and waste
- Transitioning to clean 03 transportation for all



### **REVIVE OUR OCEANS**

- Protecting and restoring coastal ecosystems
- Replenishing fish populations
- Reducing demand for fishmeal



### BUILD A WASTE-FREE WORLD



### FIX OUR CLIMATE

- Reducing food loss from farm to fork
- Phasing out singleuse and non-recycled plastics
- High-value circularity in fashion and electronics



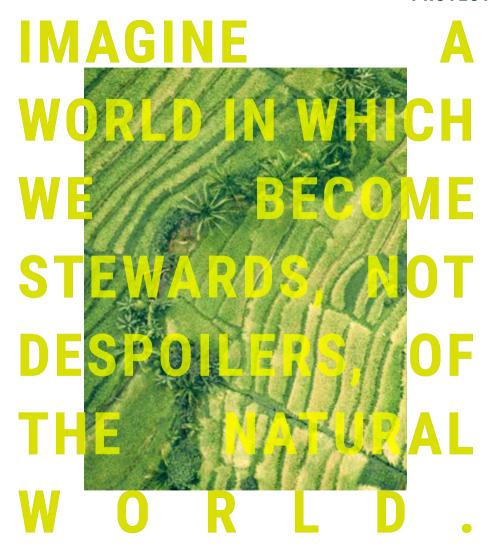
- Creating an equitable clean energy future
- Addressing non-CO2 greenhouse gas emissions
- Decarbonising hard to abate sectors



07 WASTE

06 OCEANS





...A WORLD IN WHICH farms and forests coexist without competition, in which cities are transformed into green oasis, with access to nature available to all. In which a nation's wealth is measured not only by its natural resources, but also its riches of diverse wildlife, and where generational and indigenous wisdom is brought to the fore.

05 AIR



PROTECT AND RESTORE NATURE TO PROTECT AND RESTORE NATURE, WE SEEK SOLUTIONS ACROSS THREE AREAS OF INTEREST:

01

Protecting areas of high biodiversity such as forests, wetland, peatlands and wildlife corridors

02

Restoring damaged ecosystems

03

Feeding people while protecting nature



### PROTECTING AREAS OF HIGH BIODIVERSITY SUCH AS FORESTS, WETLAND, PEATLANDS, AND WILDLIFE CORRIDORS



Biodiversity encompasses all life on earth: animals, plants, fungi, and microorganisms. However, this biodiversity is declining tens to hundreds of times faster now than at any other time in human history. One guarter of animal and plant species are currently threatened with extinction and 1 million more species face extinction within the coming decades unless we change course. Man made habitat destruction. especially land-use change, is the biggest cause of this. We know that designating protected areas can turn things around quickly. Protecting the remaining parts of the Earth which are most important for biodiversity, such as biodiversity hotspots, large intact ecosystems and wildlife corridors is the first necessary step.

### 2 RESTORING DAMAGED ECOSYSTEMS



As well as protecting the existing areas of high biodiversity, we must also restore the much larger area of the planet's ecosystems that have been damaged. Monitored global wildlife populations have seen a 69% drop on average since 1970. If we are to restore these populations to previous levels and beyond, we need to restore the ecosystems they depend on. There is no silver bullet. Turning this around requires a combination of solutions including reforestation, habitat management, rewilding, and allowing natural regeneration of forests and other ecosystems.

9

01 INTRODUCTION

EARTHSHOTS

03 AREAS OF INTEREST

04 NATUR

96 OCE

7 WASTE

8 CLIMATE

09 ENABLERS AND FILTERS

10 THE WORLD WE CHOOSE

### 3 FEEDING PEOPLE WHILE PROTECTING NATURE

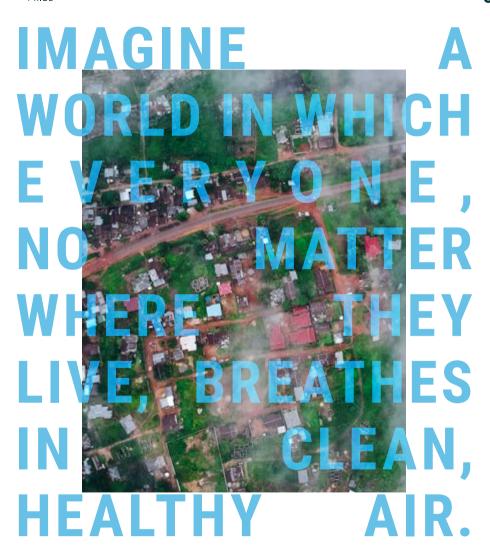


While increasing conservation and restoration is key, we also need to address the drivers of biodiversity loss. Since the 17th century, land used for agriculture has increased 5.5 times. This is the number one cause of habitat loss, accounting for 80% of all land-use change globally as natural habitats are destroyed and fragmented to make room for more crops and grazing animals. Our diet is an important factor. Much of the expansion we have seen in land use for agriculture is driven by animal farming. Eating more plants and less meat would reduce the total land use needed for agriculture, and significantly help nature recover. Another important part of the solution is sustainable agriculture. Farming techniques like crop rotation, minimum tillage and agroforestry can work with nature and improve the biodiversity on farmed land while keeping yields high.



## CLEAN OUR AIR





...A WORLD IN WHICH no child ever dies from a pollution-related illness, and in which renewable energy is affordable and plentiful everywhere: powering transport, heating homes, and cooking food. This vision is possible with the right global effort

05 AIR

### **CLEAN OUR AIR**



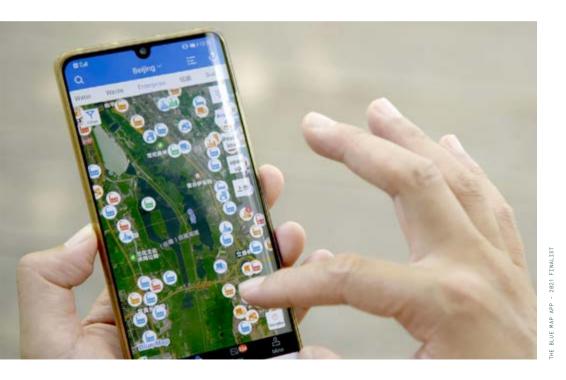
### TO CLEAN OUR AIR, WE SEEK SOLUTIONS ACROSS THREE AREAS OF INTEREST:

Engaging citizens in data collection and clean air policies

Preventing the burning of fields, forests and waste

Transitioning to clean transportation for all

### ENGAGING CITIZENS IN DATA COLLECTION AND CLEAN AIR POLICIES



Today, almost everyone breathes air exceeding World Health Organisation air quality limits and those in low and middle-income countries suffer the most. While more governments than ever are monitoring air quality and sharing data publicly, there are gaps especially in smaller cities and rural areas.

Low-cost sensors exist, but the quality of data collected by them is often poor. Where there is data, it is rarely in real-time or available to aid decision-makers. Globally we need a more concerted effort of national and local stakeholders, to make unrestricted and transparent data the norm. Crucially, this is not about gathering data for data's sake. It needs to be shared so it can increase the accountability of polluters and enable citizens and governments to join forces behind progressive policies.



### **CLEAN OUR AIR**

### PREVENTING THE BURNING OF FIELDS, FORESTS AND WASTE



The world over, farmers often set fire to their fields to clear stubble, weeds and waste before sowing the next season's crops. It is fast and efficient, but it's also the source of deadly black carbon emissions. In theory it could be fixed overnight but farmers are under extreme pressure to make a living, caught in a debt trap, buying seeds, fertilisers and pesticides on credit at high-interest rates because banks do not deem them creditworthy. The only solutions are those that benefit both farmers and nature.

### **CLEAN OUR AIR**

### 3 TRANSITIONING TO CLEAN TRANSPORTATION FOR ALL

Between now and 2050, the global population is expected to grow by 1.5 billion with the population of Africa expected to double. Much of that increase will occur in cities and as cities grow, so too will traffic volumes and demand for vehicles. We are already seeing a shift towards electric vehicles, especially in China, Europe and USA, and we need this to happen faster across the world. However, we can't simply swap all the internal combustion engines for battery powered alternatives and have the same number of vehicles on the road. We must also look for ways to redesign the world's transport systems and reduce traffic. This could be through initiatives like creating widespread access to green public transport, more pedestrianised areas or

an increase in cycle lanes.



(2)

1 INTRODUCTION

02 EARTHSHOTS

03 AREAS OF INTEREST

04 NATURE

06 OCEANS

07 WASTE

08 CLIMATE

09 ENABLERS AND FILTERS

10 THE WORLD WE CHOOSE



**AREAS OF INTEREST** 



### REVIVE OCEANS



### **REVIVE OUR OCEANS**



In which vast pods of whales cross them without disturbance, where mangrove swamps and coral reefs remain untouched, and where oceans fill with an astonishing diversity of marine life, while providing livelihoods and sustenance for those who rely upon them

05 AIR

### **REVIVE OUR OCEANS**



TO REVIVE OUR OCEANS, WE SEEK SOLUTIONS ACROSS THREE AREAS OF INTEREST:

01

Protecting and restoring coastal ecosystems

02

Replenishing fish populations

03

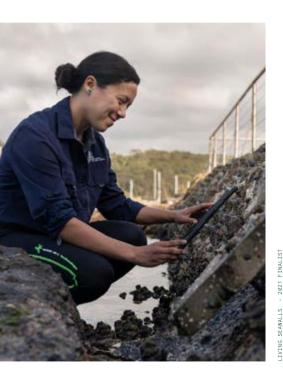
Reducing demand for fishmeal

05 AIR

### **REVIVE OUR OCEANS**

### PROTECTING AND RESTORING COASTAL ECOSYSTEMS

enormous powers of recovery when we remove the most damaging practices and keep the rest under control.



Protecting and restoring coastal ecosystems benefits everyone. Coral reefs, mangroves, salt marshes, and kelp forests lie where the land meets the sea. They are a rich source of biodiversity, providing nurseries for fish and cover from predators. They also reduce coastal erosion, offer protection from storms, attract tourism, provide jobs, and store carbon. However, they are the part of the ocean most heavily used and impacted by human activity. At the same time, rising ocean temperatures, rising sea levels, and rising carbon emissions have all negatively affected them. Imagine what could be achieved if we create the right incentives for protection and set our minds to restoring them. Oceans have

### 2 REPLENISHING FISH POPULATIONS

We want to see oceans thrive, but as things stand, fish populations are in decline. The cause: overfishing, pollution, and poor management of commercial fisheries. This negatively impacts the ecosystems, creating an imbalance that erodes the food web and leads to a loss of vitally important marine life. It also threatens the income of millions of people around the world who depend on fishing for their income. Allowing an overfished area to replenish for even two years can fully restore marine life, and there is evidence to show it can create abundant marine life in surrounding areas. too. This brings broad ocean ecosystem benefits, protects biodiversity, and boosts fisheries yields, which can empower local communities, create jobs and support

livelihoods.



### 3 REDUCING DEMAND FOR FISHMEAL

This could be tech-based solutions, ways to protect and monitor large sections of the ocean, education around sustainable practices, or incentivising people to adopt sustainable fishing practices.



Fishmeal is an ingredient used primarily in diets for farmed fish & domestic animals, and millions of tonnes are produced every year, often from small, wild-caught fish, like herring. It is a vital practice, but has become unsustainable and inefficient. It is estimated four to five tonnes of whole fish are required to make a single tonne of dried fish meal and 20% of all wild-caught fish are used to feed farmed fish. This is having a negative effect on marine ecosystems. Small fish and crustaceans, such as sardines. anchovies, and krill, play a vital role in the food chain and without them there is a risk of population collapse further up the chain. Swift action could prevent this while also improving food security.





A world in which every item of clothing made is reworn or recycled, where resources are equally distributed, and where food poverty is eradicated and the food we once threw away, used to fill empty stomachs

07 WASTE



TO BUILD A WASTE-FREE WORLD, WE SEEK SOLUTIONS ACROSS THREE AREAS OF INTEREST:

Reducing food loss from farm to fork

Phasing out single-use and non-recycled plastics

High-value circularity in fashion and electronics

### REDUCING FOOD LOSS FROM FARM TO FORK



CITY OF MILAN - 2021 WIN

Roughly 40% of the food produced globally is lost or wasted: equal to 2.5 billion tonnes a year. In low- and middle-income countries, the problem

is largely one of loss, as food fails to make it through the production and transportation stages. Waste among retailers and end consumers is a larger factor in higher-income countries. To produce the food we need, vast swathes of land are turned over to agriculture, but almost a quarter of cropland is used to produce food that is lost or wasted. Solutions are needed to reduce waste throughout the entire system, from educating farmers, to protecting crops, improving tracing, and extending the shelf life of our food.



### PHASING OUT SINGLE-USE AND NON-RECYCLED PLASTIC

Annually we produce about 460 million tonnes of plastic per year, more than double the amount we did 20 years ago. Almost 75% of it ends up in landfill or as litter, and less than 10% is recycled. It is the most harmful and most persistent type of ocean litter, ending up as microplastics which are lethal for whales, seals, turtles, birds, and fish. As a fossil fuel product, plastics also have an enormous carbon footprint, accounting for over 3% of annual GHG emissions. Phasing out plastics means moving away from single-use and non-recycled plastics, replacing them with recycled or alternative materials that biodegrade rather than pollute.



OTPLA - 2022 WINN

07 WASTE



### 3 HIGH-VALUE CIRCULARITY IN FASHION AND ELECTRONICS

In today's consumer culture, we are taught we need to buy and use more. Brands, influencers, and advertisers convince us we need to have the latest season's fashion and the latest phone model. This barrage of messaging masks the mountains of waste that overconsumption causes. Each year, less than 1% of material used to produce clothes is recycled into new clothing. Between 2000 and 2015, clothing production doubled while the average number of times a garment was worn decreased by 36%. The average EU citizen, meanwhile, uses up 18 kilograms worth of electronic goods a year, representing 70% of hazardous waste that ends up in landfill. If we are to turn the tide against environmental damage we need to not only use less, but also extend the lifespan of goods and materials

through a culture of re-selling, renting, repairing, and remaking. This requires a shift so that a product or its components can re-enter a loop, with infrastructure to support their journey back to the start of the chain. Designing for re-use and zero waste requires the right blend of technology, products, business models and new materials.



THIS SOLUTION ALSO HELPS US:







PROTECT CLEAN OUR









Where the buildings we live in, and the transport we use does not cost the earth. Where seasonable, low-carbon footprint food is plentiful and affordable, and the air is clean and breathable.



05 AIR

07 WASTE



### TO FIX OUR CLIMATE, WE SEEK SOLUTIONS ACROSS THREE AREAS OF INTEREST:







Please note that while carbon removal solutions haven't been explicitly highlighted as a priority area within Fix our Climate they are of interest and feature in multiple priority areas across the Earthshots. Land based carbon sink solutions such as forests, wetlands, peatlands and soils are essential for biodiversity improvements on land and therefore appear within our Protect and Restore Nature priority areas. Similarly coastal and ocean sink solutions such as mangroves, salt marshes and seagrass meadows are essential for ocean health and appear within our Revive our Oceans priority areas. We are also open to engineered sink solutions which fall within the last priority area in Fix our Climate.

04 NATURE

### CREATING AN EQUITABLE CLEAN ENERGY FUTURE



The last decade has seen vast improvements in energy storage, the adoption of electric vehicles, and in solar power efficiency. In 2022, renewables accounted for more than 90% of growth in electricity demand. However, the use of fossil fuels remains high, with the likes of coal, oil and gas continuing to fuel much of the world's current energy demand. Fossil fuels are by far the biggest contributor to climate change, accounting for 75% of all emissions. The clean energy transition, although gaining momentum, is still in its infancy. We need to move faster. Capacity additions of renewables must triple by 2030. We also need to scale up geothermal and hydroelectric plants, in addition to wind and solar. The benefits and costs of this transition must be fair and equitable, with large-scale energy alternatives to fossil fuels that are cheap, safe, and sustainable, whilst not relying on continued extraction of rare mineral resources from the Global South.

### ADDRESSING NON-CO<sup>2</sup> GREENHOUSE GAS EMISSIONS

To turn the tide against climate change, we need to go further than decarbonisation alone. We must also curb so-called "super pollutants" which have an outsized impact on global temperatures. They include short-lived pollutants, such as methane, black carbon soot, tropospheric ozone, and hydrofluorocarbons, as well as the longerlived nitrous oxide. Thes don't stay in the atmosphere as long as carbon emissions, but they have a bigger warming effect. This shorter lifespan can work to our advantage. If we stop their escape into the atmosphere, we will reduce warming faster. Cutting super-pollutants like this could prevent 90% of their predicted warming within a decade and keep the 1.5 degrees commitment alive.



LANZATECH - 2022 FIN

### BECARBONISING HARD TO ABATE SECTORS



Until recently, government and business focused on the easiest sources of emissions to address, including electricity generation and passenger vehicles. Such areas account for more than two-thirds of global emissions. Less attention, however, has been on the so-called "hard to abate" sectors, such as agriculture, heavy duty transportation like shipping and aviation, and heavy industry like cement and steel. These account for 20% of emissions, a proportion likely to grow as reductions are made elsewhere. Many technologies required to bring about the energy transition have only recently been developed. But innovation needs to be faster, especially where carbonintensive processes can be replaced with alternatives. Only by making these options economically viable can the transition be done at scale.

### O ENABLERS AND EILTERS



### **CROSS-CUTTING ENABLERS**

### OUR REVIEW OF THE SCIENTIFIC LITERATURE AND CONVERSATIONS WITH EXPERTS

identified approaches and tools that can accelerate the environmental improvements we seek without being specific to any single Earthshot. We call them the cross-cutting enablers, and when adopted by innovators and their supporters, they could rapidly accelerate our mission to achieve the Earthshots

We have identified five such enablers which are meant to inspire our nominators and nominees when searching for game-changing innovations. These are:



SOLUTIONS LED AND INFORMED BY INDIGENOUS AND LOCAL COMMUNITIES



SOLUTIONS THAT USE TECHNOLOGY, AI OR DATA TO ENABLE TRANSFORMATIVE CHANGE



SOLUTIONS
THAT PROMOTE
SHARED ECONOMIC
OPPORTUNITY



SOLUTIONS THAT CREATE OR LEVERAGE NATURE AND CARBON MARKETS, NOVEL FINANCIAL MECHANISMS AND ESSENTIAL LEGAL SOLUTIONS



SOLUTIONS THAT ENABLE POLICY CHANGE



When it comes to selecting the 15 Finalists from the 1000+ nominations we receive each year, we have a thorough process to assess and filter out the best submissions. During years 1 and 2 we have improved and refined this process, and we now have 4 key filters which we use to select the winners

FILTER 01

### POTENTIAL FOR GLOBAL IMPACT

Finalists will have the potential to be relevant on a global level by 2030. They must clearly articulate their impact to date, and their potential to make a difference in the future based on one or more of our shortlisted environmental and social metrics

FILTER 02

### DIVERSITY OF SOLUTION TYPES

We accept solutions from any country or sector in the world. It is through a diversity of solutions that we identify new opportunities or connections, and demonstrate the need for collective action globally. Nominees could be a not-for—profit or for-profit organisation, a local or national Government, a partnership, or a team. We place a particular emphasis on geographic representation, gender, and indigenous representation and actively source innovations from these communities.

FILTER 03

### STAGE OF SOLUTION

Finalists will have solutions that can be scaled or replicated quickly through financial, communications or organisational support. Solutions will be well developed beyond the idea stage, have made significant progress with their solution, and need support to be scaled beyond financial support alone

FILTER 04

### ORGANISATIONAL FOUNDATIONS

Finalists will encounter many opportunities to scale their solution and inspire replication through the Earthshot Prize so we will seek solutions that are mature enough to maximise the support they receive. We will judge this based on the foundations they already have in place, accounting for the quality of the leadership team, their commitment to inclusion and their organisational maturity.

07 WASTE

### FIFTEEN AREAS OF INTEREST.



### **PROTECT** AND RESTORE NATIIRE



### **CLEAN OUR** AIR



### **REVIVE OUR** OCEANS



### **BUILD A** WASTE-FREE WORLD



### FIX OUR CLIMATE

- Protecting areas of high biodiversity such as forests, wetland, peatlands and wildlife corridors
- Restoring damaged ecosystems
- Feeding people while protecting nature



- 01 in data collection and clean air policies
- Preventing the burning of fields, forests and waste
- Transitioning to clean 03 transportation for all

- Protecting and restoring coastal ecosystems
- Replenishing fish populations
- Reducing demand for fishmeal

- Reducing food loss from farm to fork
- Phasing out singleuse and non-recycled plastics
- High-value circularity in fashion and electronics
- Creating an equitable clean energy future
- Addressing non-CO2 greenhouse gas emissions
- Decarbonising hard to abate sectors

### **FOUR FILTERS** TO ASSESS **AGAINST**

01 - POTENTIAL FOR GLOBAL IMPACT

03 - STAGE OF INNOVATION

02 - DIVERSITY OF SOLUTION TYPES

04 - ORGANISATIONAL FOUNDATIONS

### **FIVE CROSS CUTTING ENABLERS**

- 01 SOLUTIONS THAT USE TECHNOLOGY, AI OR DATA TO ENABLE TRANSFORMATIVE CHANGE
- SOLUTIONS THAT CREATE OR LEVERAGE NATURE AND CARBON MARKETS, NOVEL FINANCIAL MECHANISMS AND ESSENTIAL LEGAL SOLUTIONS
- 03 SOLUTIONS LED AND INFORMED BY INDIGENOUS AND LOCAL COMMUNITIES
- 04 SOLUTIONS THAT PROMOTE SHARED ECONOMIC OPPORTUNITY
- 05 SOLUTIONS THAT ENABLE POLICY CHANGE

07 WASTE

THE EARTHSHOT PRIZE



### THE WORLD WE CHOOSE

# HUR F

We are, after all, the only species on Earth capable of imagining and creating a better future for ourselves. Throughout history, there have been few problems so great we have not imagined a solution, whether it was the 1969 Moon Shot mission or our efforts to create a Covid-19 vaccine. The environmental crisis is perhaps the greatest of our lifetimes, but with imagination, innovation and commitment, we can solve it too.

We are already making progress. Over the past three years, the Earthshot Prize has discovered, spotlighted and scaled solutions from all over the world, demonstrating the power of what it means to put our collective weight and support behind those on the front lines of innovation.

That's why we need urgent optimism. Urgent because the time we have to restore the world is finite; optimism because we have the collective ingenuity to realise this ambition.

Let us use this Roadmap as a blueprint to imagine and then drive collectively towards a planet where the natural world, on land and in the oceans, is flourishing; where everyone breathes in clean healthy air; where nothing we use or make ever goes to waste; and where we cut carbon from the atmosphere and avert the climate crisis.

We do this by working together - innovators, NGO's, commercial organisations, philanthropists, academics and the public all have a role to play. Together, we create a more prosperous world for all, not only for ourselves, but for our children and for all generations to come.

DOWNLOAD THE FULL 2023 ROADMAP

