

WORLD Resources Institute

ENERGIZING THE GLOBAL TRANSITION

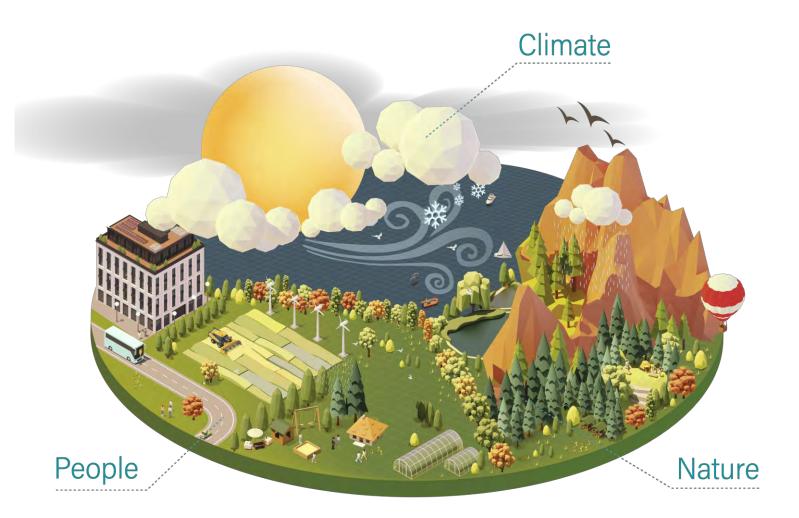
Ani Dasgupta

President & CEO

@AniDasguptaWRI

MIT Earth Day Colloquium April 22, 2024

BEYOND CLIMATE





AN UNEQUAL WORLD



>690 million people living in extreme poverty in 2023

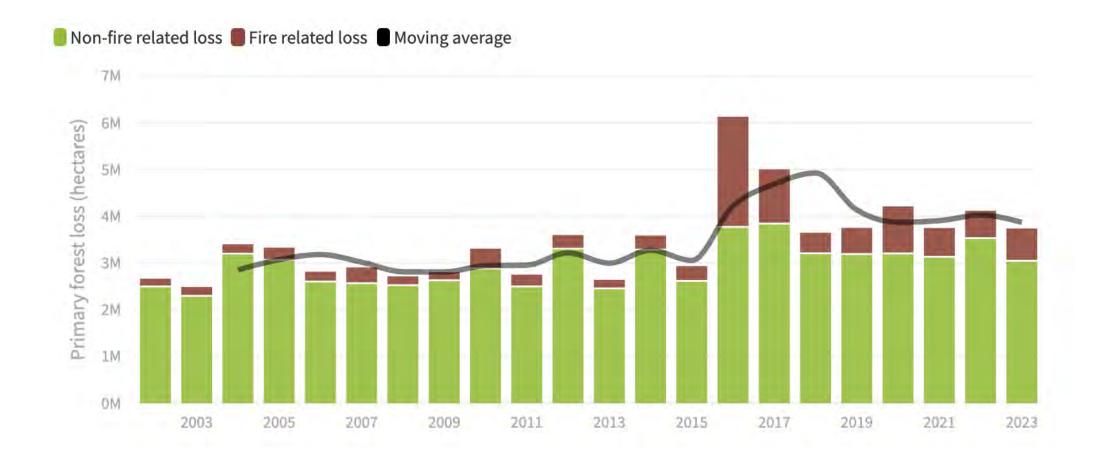
CLIMATE IS A THREAT MULTIPLIER



3.6 billion people, or nearly half the global population, live in areas highly susceptible to climate change

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TREE COVER LOSS A PERSISTENT PROBLEM

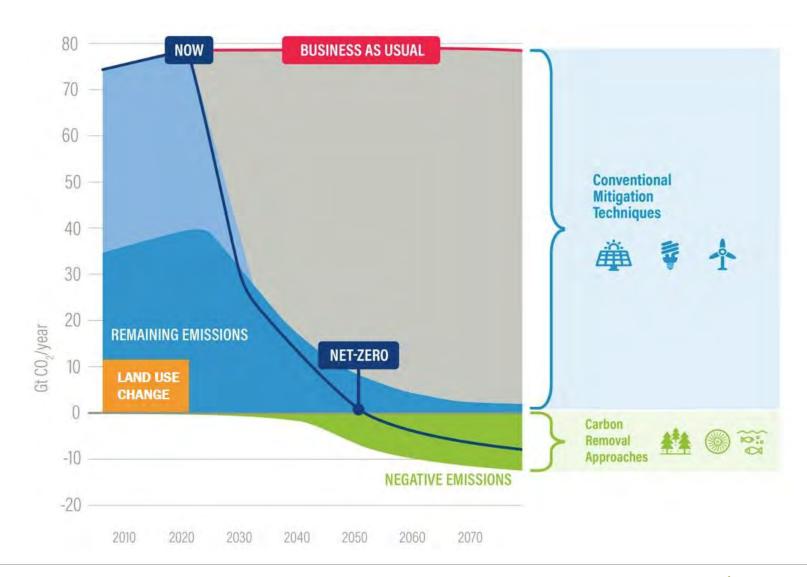




NATURE

CAN'T REACH 1.5°C WITHOUT NATURE







EVERY FRACTION OF A DEGREE MATTERS



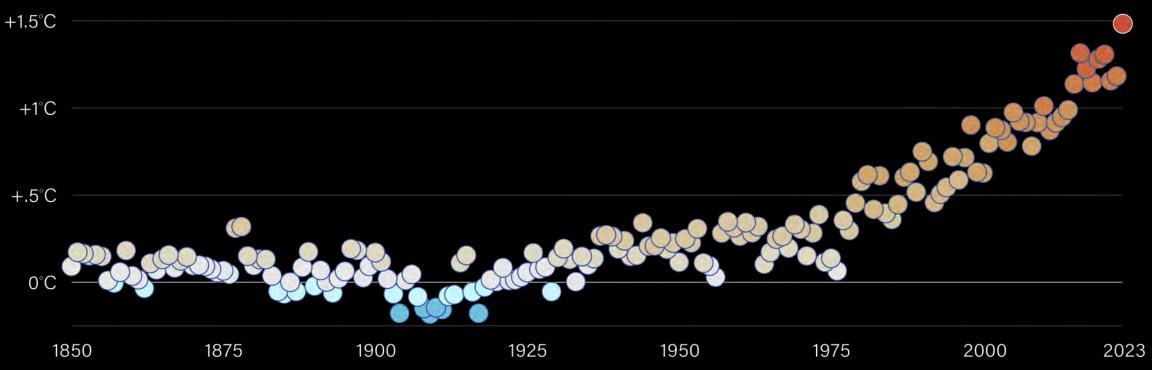
EXPECTED GLOBAL TEMPERATURE INCREASE IN 2100

2010 (CANCUN)3.7-4.8°C2015 (PARIS)3.0-3.2°C2021 (GLASGOW)2.6-2.7°C2022 (SHARM EL-SHEIKH)2.4-2.6°C





Average global temperature compared to 1880-1899

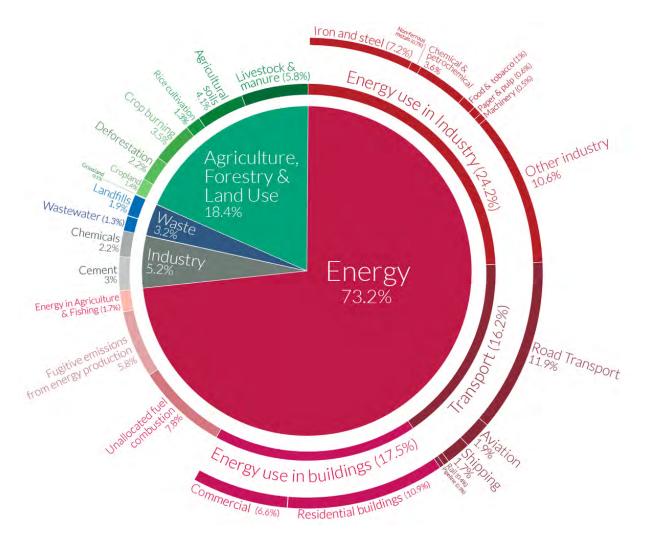




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NO NET-ZERO WITHOUT ENERGY

ENERGY IS THE BIGGEST CONTRIBUTOR

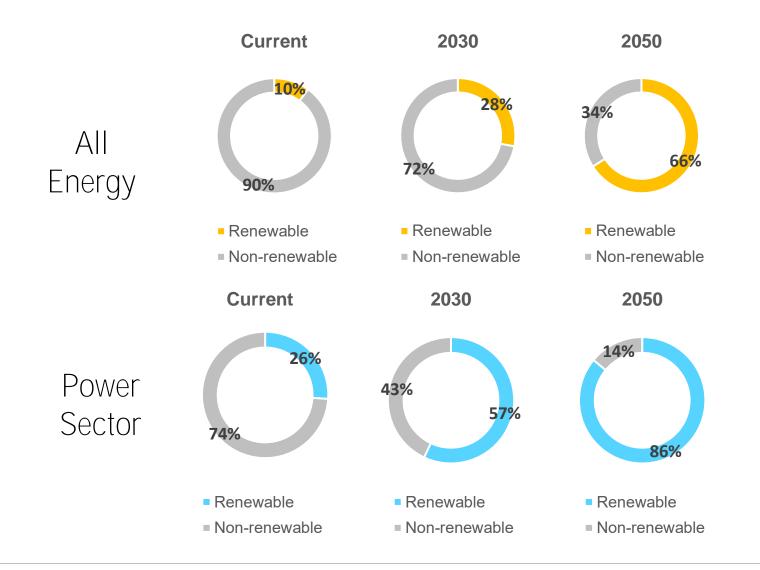


Energy system accounts for 73% of global GHG emissions

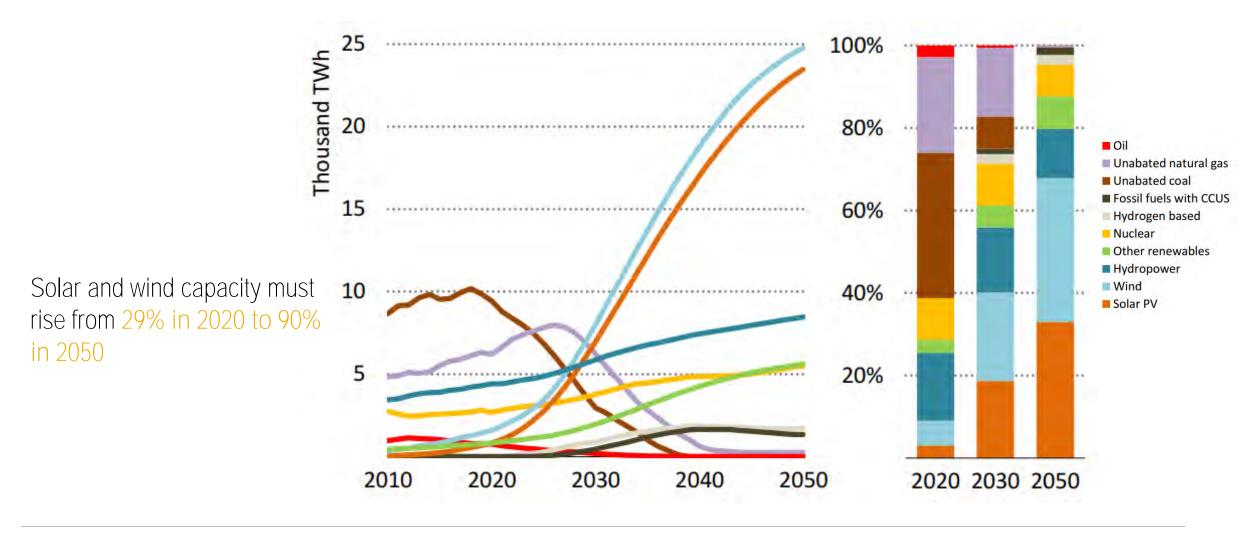
Source: Our World in Data

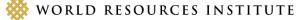


WHAT'S NEEDED IN THE ENERGY TRANSITION



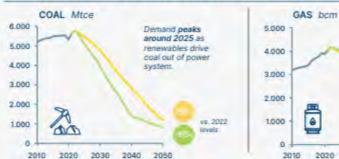
THE ROAD TO NET ZERO BY 2050



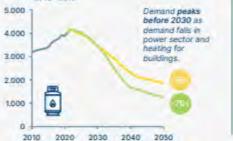


REDUCING FOSSIL FUEL DEMAND IS CRUCIAL

Reducing emissions from fossil production is important, but reducing fossil fuel demand is crucial



FOSSIL FUEL DEMAND TO 2050 IN ETC SCENARIOS





2050

100

80

60

40

20

a

2010

0

2020

2030

2040

Scenarios: HISTORIC

ETC - ACF Accelerated but Clearly Feasible

ETC - PBS Possible but Stretching

ANNUAL FOSSIL FUEL DEMAND BY SECTOR IN PBS SCENARIO

Use sectors		Power	Buildings	Industry	Other	Shipp	ing Aviation	Road transport
	COAL	Ro	Total Mtce	GAS		Total Bcm	OIL	Total Mb/d
2022	•	• •	• 5,800		•••	4,150		97
2030	•	• •	• 3,950		• • •	3,350		
2040	•	•	· 1,450		<u>.</u>	1,600	• • • •	• • 🔴 🛛 42
2050	•	•	800		• •	1,250	-	• • 4
KEY ACTIONS:	3x total renewables capacity can displace 1,000 Mtce of coal in power by 2030		3x renewables and 3x installed heat pumps in buildings can displace around 600 Bcm of gas by 2030			Growing passenger EV fleet to over 300m helps displace 5 Mb/d of oil by 2030		

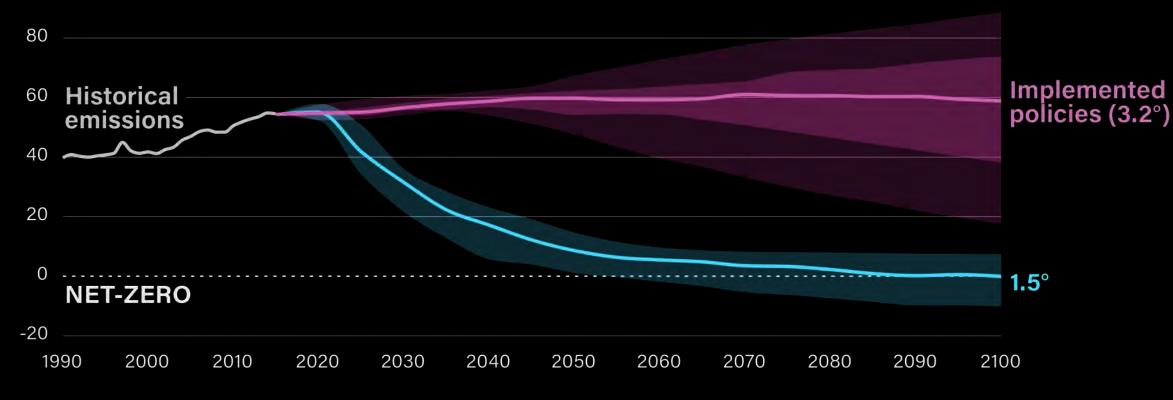
2015: 196 NATIONS COM**NIT IN PARIS^{ies}** Conférence sur les Changements Climatiques 2015

COP21/CMP11



GLOBAL STOCKTAKE: THE WORLD IS OFF TRACK

Gigatons of CO2-equivalent emissions (GtCO2-eq/yr)



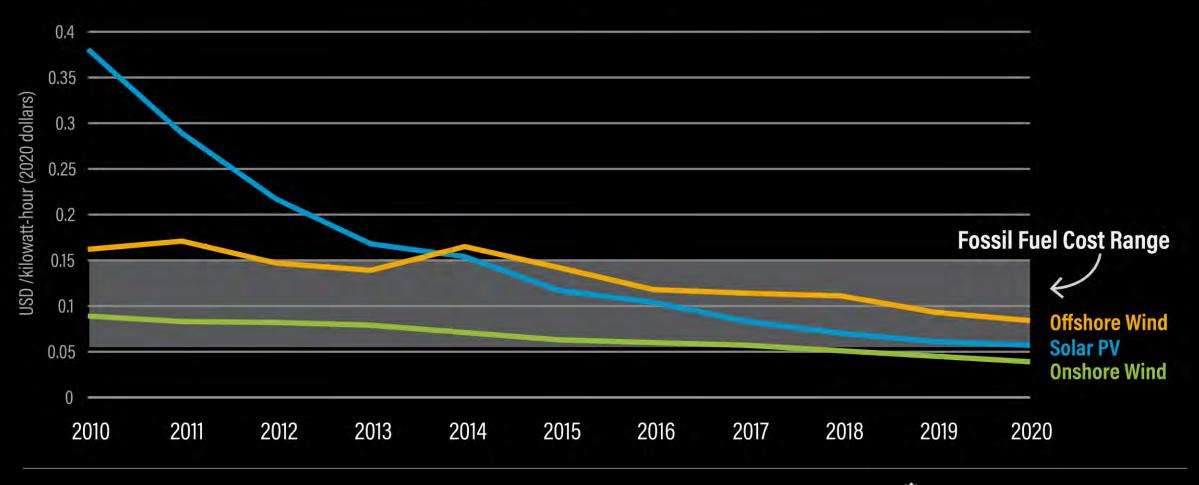
Need to reduce emissions by 43% by 2030 for 1.5°C future Countries' current plans will at best lower emission by 8%



THE ECONOMICS FAVOR RENEWABLES:

Building a New Coal Plant Would Cost More Than Building New Renewables in All Major Markets

Levelized Cost of Electricity





WORLD

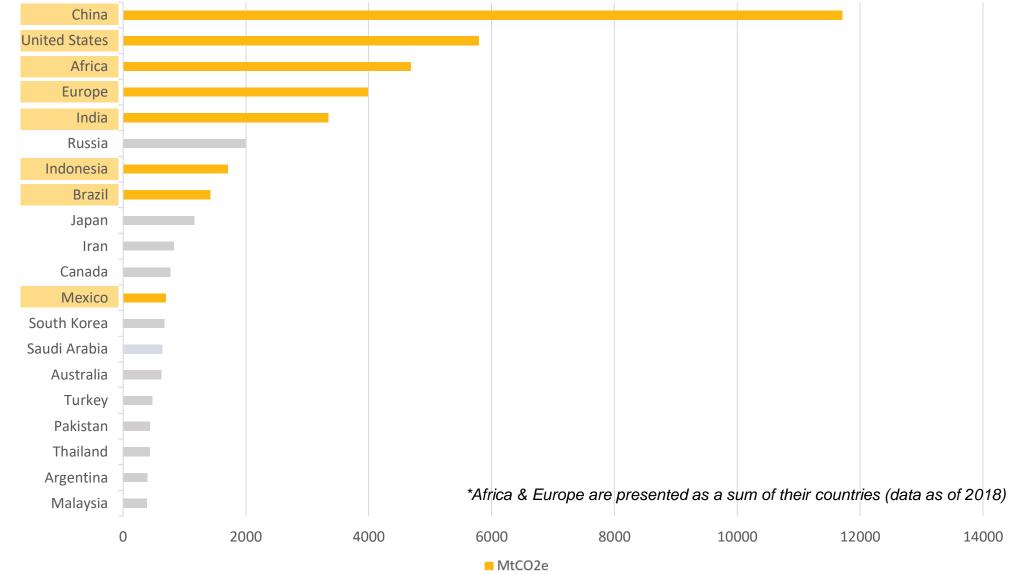
RESOURCES

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WE NEED FOCUS

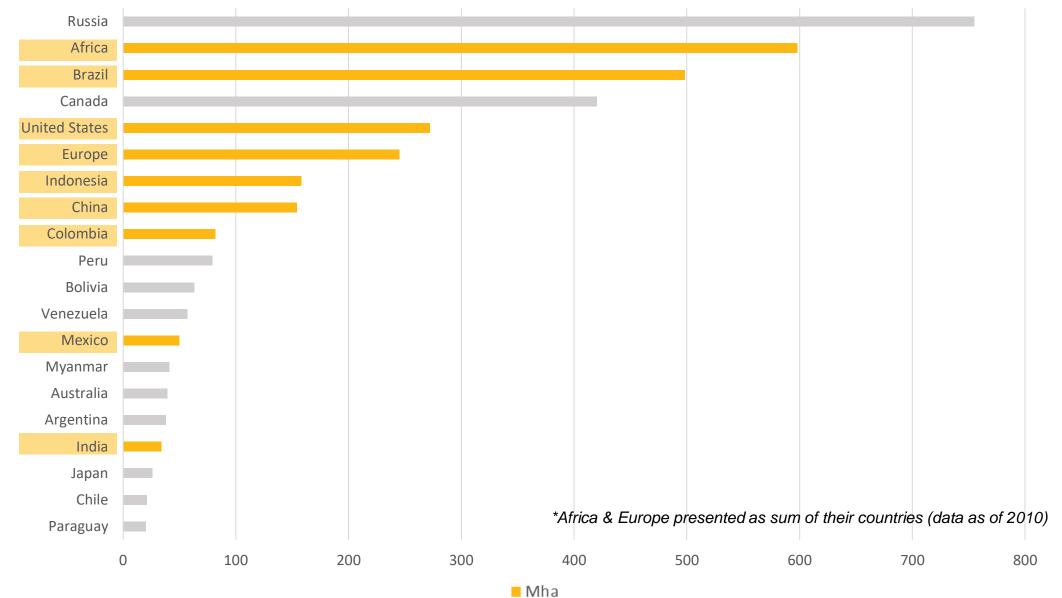
TOP EMITTING GEOGRAPHIES





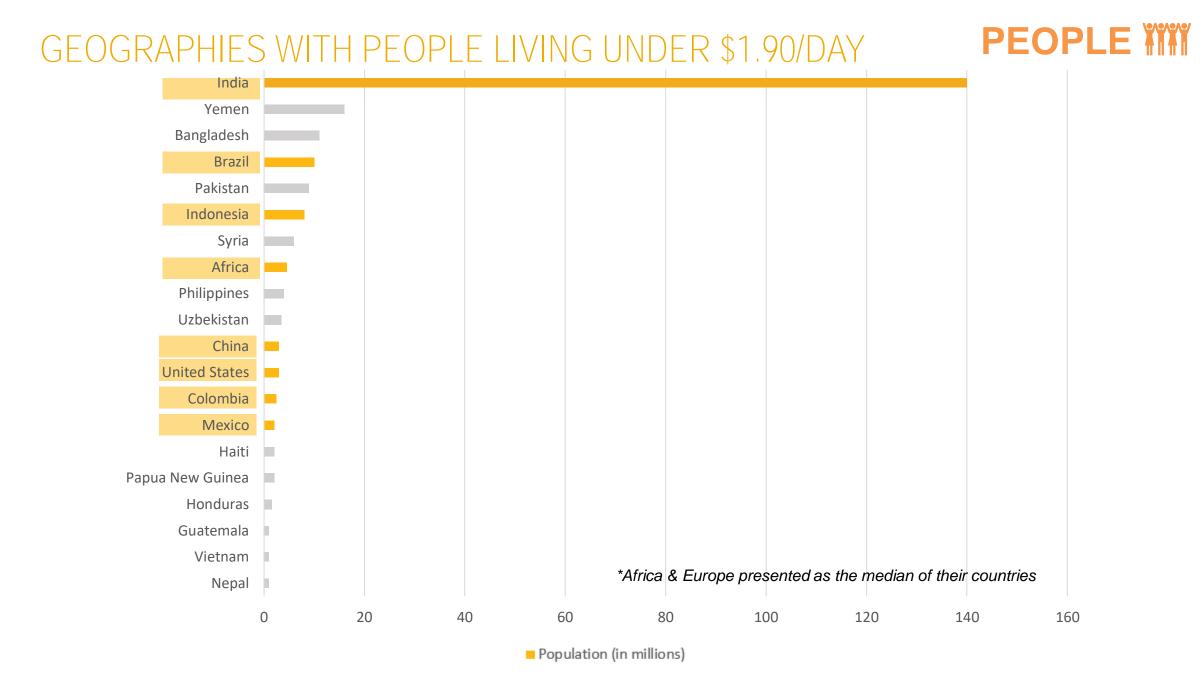
Source: Climate Watch Historical GHG Emissions. 2021. Washington, DC: World Resources Institute. Available online at: https://www.climatewatchdata.org/ghg-emissions

GEOGRAPHIES WITH MOST REMAINING FORESTS



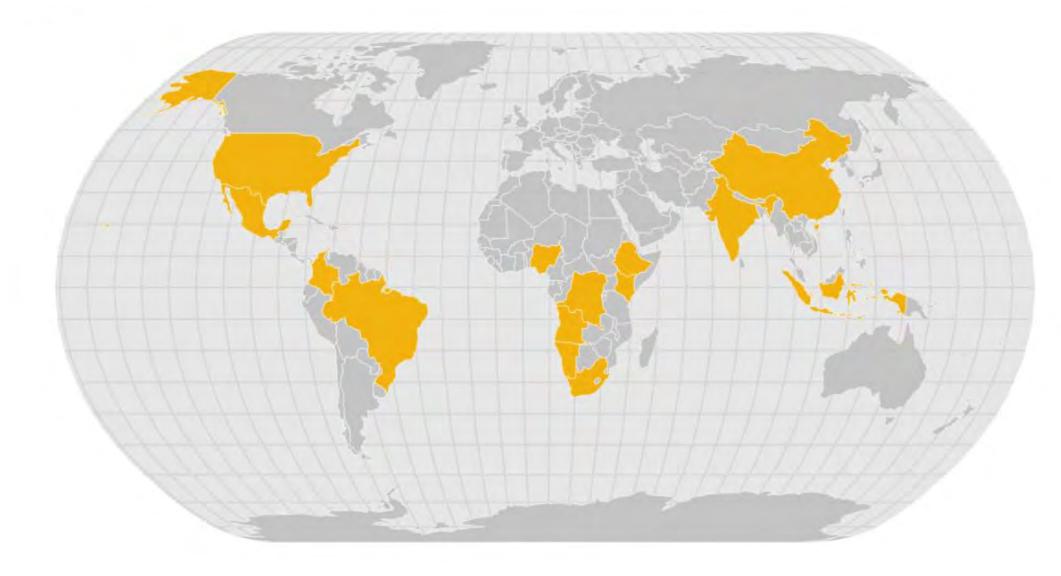
NATURE 🤛

Source: Global Forest Watch. "Location of forest in ". Accessed on 14/04/2022 from <u>www.globalforestwatch.org</u>.



Source: World Bank, PovcalNet. Data are based on primary household survey data obtained from government statistical agencies and World Bank country departments.

TO REACH TIPPING POINT, MUST FOCUS ON KEY COUNTRIES







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INDIA'S TRANSITION

A COMPLEX CHANGE

- 500 gigawatts of renewable energy capacity by 2030
- Reduce emission intensity of GDP by 45% by 2030 compared to a 2005 baseline

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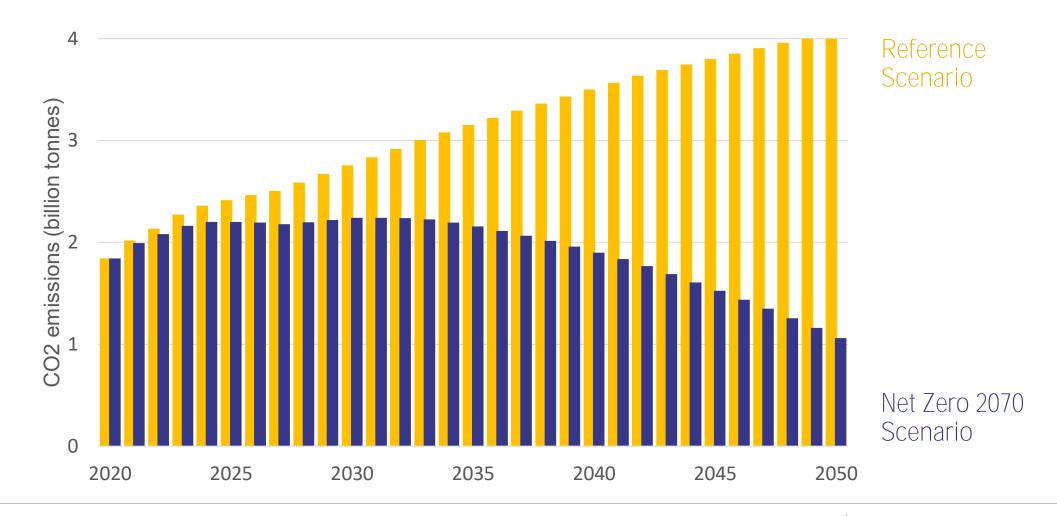
• 13 million jobs tied to coal

Photo: Unsplash/Hassan Afridhi

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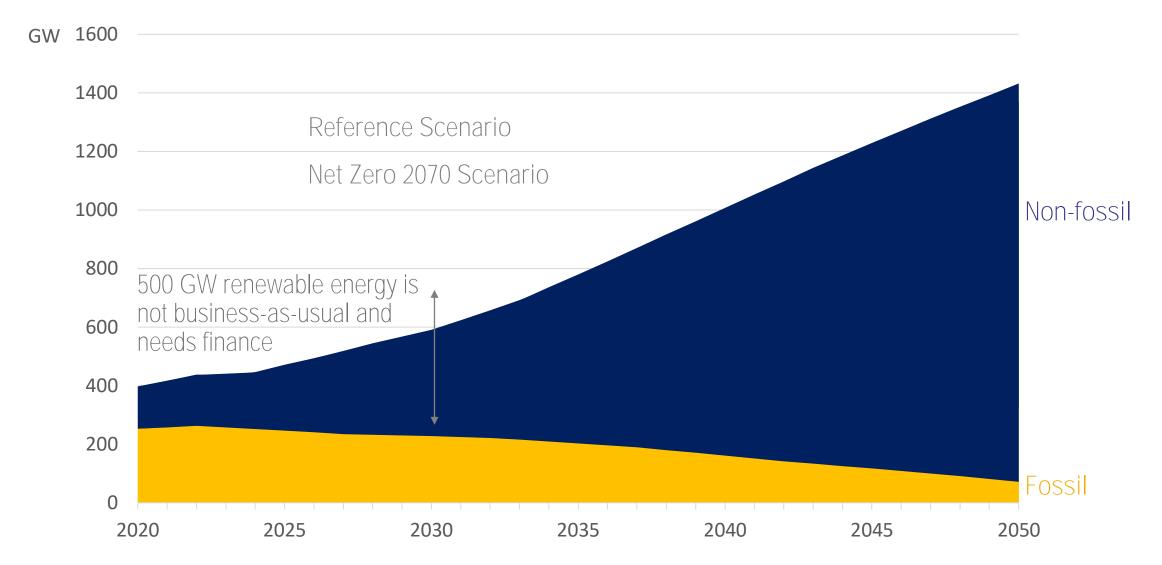
D RESO

AS INDIA DEVELOPS, IT CAN CUT CO2 EMISSIONS BY 74%...



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...BUT, MUST MEET RISING DEMAND



Source: WRI India analysis https://www.wri.org/research/pathways-decarbonizing-indias-energy-future-scenario-analysis-using-india-energy-policy

A SURGING WORKFORCE

- 520 million workers
- 80 million in organized sector
- 8-10 million join work force each year

HITACHI

Low carbon transition can create find the million jobs per year

ADDRESSING URBAN ENVIRONMENTAL STRESS AND INEQUALITY

- Urban population to double to 800 million by 2047
 Urban GDP to be \$25 trillion of \$30 trillion by 2047
- Urban infrastructure investment of \$1 trillion by 2035

Carl

STATE LEVEL FOCUS

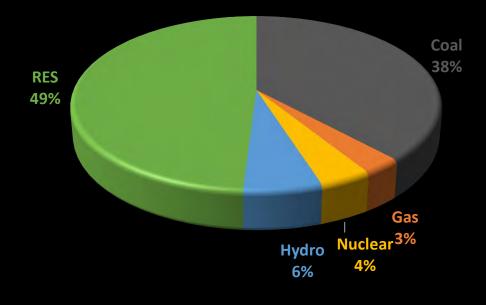
WRI INDIA

Tamil Nadu | Rajasthan | Kerala | Jharkhand | Assam | Delhi

Photo: Unsplash/Milan John



TAMIL NADU



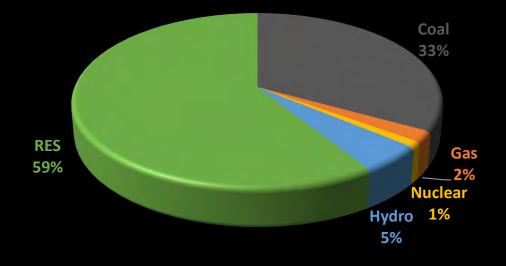
TARGETS

- Net-zero before 2070
- 50% renewable generation by 2030

OPPORTUNITIES

- Utility support for power and green procurement strategies
- Energy planning for greater renewable generation
- Support new technologies

RAJASTHAN

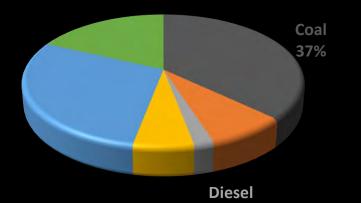


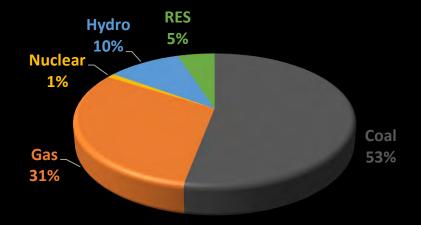
TARGETS

- 30 GW solar by 2025
- 90 GW renewable generation by 2030

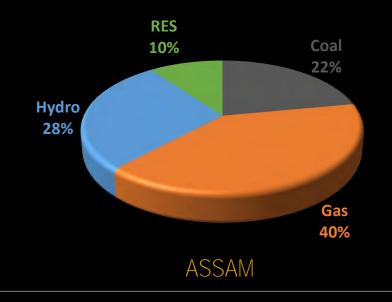
OPPORTUNITIES

- Energy planning for greater renewable generation
- Energy storage to increase utilization and export of solar
- Increase renewable consumption

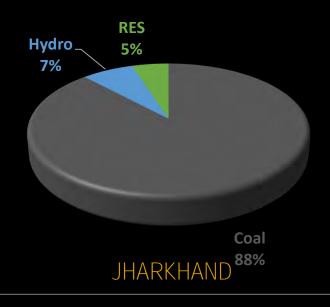




KERALA









OUR WRI INDIA STRATEGY

Clean Energy Supply



Decarbonized Energy Consumption



Energy Access for Equitable Development



Energy Minerals, Land and Circularity*



PILLAR 1: CLEAN ENERGY SUPPLY

STRENGTHENING STATE ENERGY TRANSITIONS

 Research on green tariffs, green open access and other renewable products

RESEARCHING NEW TECHNOLOGIES

Support national government on green hydrogen and offshore wind energy
Support state specific research on battery energy storage and market mechanisms for more renewable deployment

PILLAR 2: DECARBONIZED ENERGY CONSUMPTION

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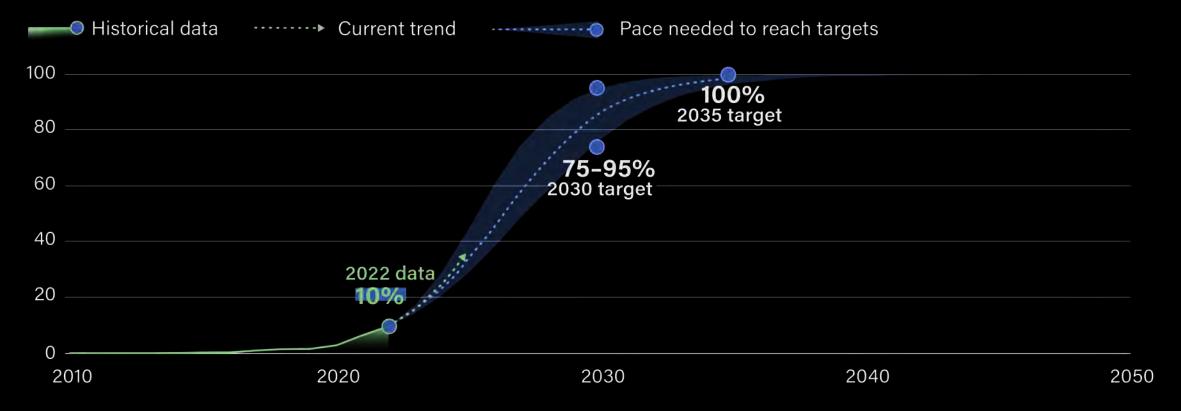
INDUSTRIAL DECARBONIZATION

- Expanding support for MSMEs
- Pathways for heavy industry
 FRANSPORT DECARBONIZATION
 - Cleaner fuels for rail and road
 - Inducing modal shift
- Integrated urban planning
 BUILDING DECARBONIZATION
 - Implement India Cooling Action Plan
 - Clean energy roadmaps for urban governments

TATA

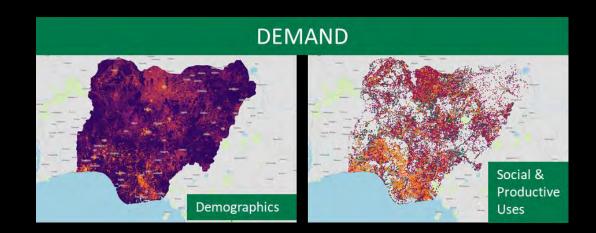
EXPONENTIAL PROGRESS IS POSSIBLE

Share of electric vehicles in light-duty vehicle sales (%)



PILLAR 3: ENERGY ACCESS FOR EQUITABLE DEVELOPMENT





SUPPLY



Source: Energy Access Explorer



ENERGY ACCESS FOR HEALTH

PHC Byrnihat Umling, Ri-Bhoi district Meghalaya		Gohpur, Sonitpur district Assam
Narang HWC Sub-centre Umling, Ri-Bhoi district Meghayala		Majuli Boat Clinic Majuli district Assam
CHC Patharkhmah Patharkhmah, Ri-Bhoi district Meghalaya	- Aling	Jorhat Christian Medical Centre Barbheta, Jorhat district Assam
Williamnagar Civil Hospital Williamnagar, East Garo Hills district Chhattisgarh	- my	BMCH Alipur Silchar, Cachar district Assam
HWC PHC Patewa Patewa, Mahasamund district Chhattisgarh	the produce	Bazarichara MPHC Lowairpoa, Karimganj District Assam
PHC Dondekala Dondekala, Raipur district Chhattisgarh	E formande	Nagrabazar PHC Lowairpoa, Karimganj District Assam
UPHC Ama seoni Ama Seoni, Raipur district Chhattisgarh	Tool and the second	Bharat Mata Hospital Muri, Ranchi district Jharkhand
CHC Tumgaon Tumgaon, Mahasamund district Chhattisgarh	and the second s	CHC Ratu Ratu, Ranchi district Jharkhand
PHC Sugganahalli Magadi, Ramnagar district Karnataka	the second secon	Constant Lievens Hospital & Research Center Mandar, Ranchi district Jharkhand
PHC Gumballi Yelandur, Chamrajnagar district Karnataka		Nav Jivan Hospital Satbarwa, Palamu district Jharkhand
SDH Raidakhol Rairakhol, Sambalpur district, Odisha		HWC PHC Pandripada Pandripada, Ganjam district, Odisha



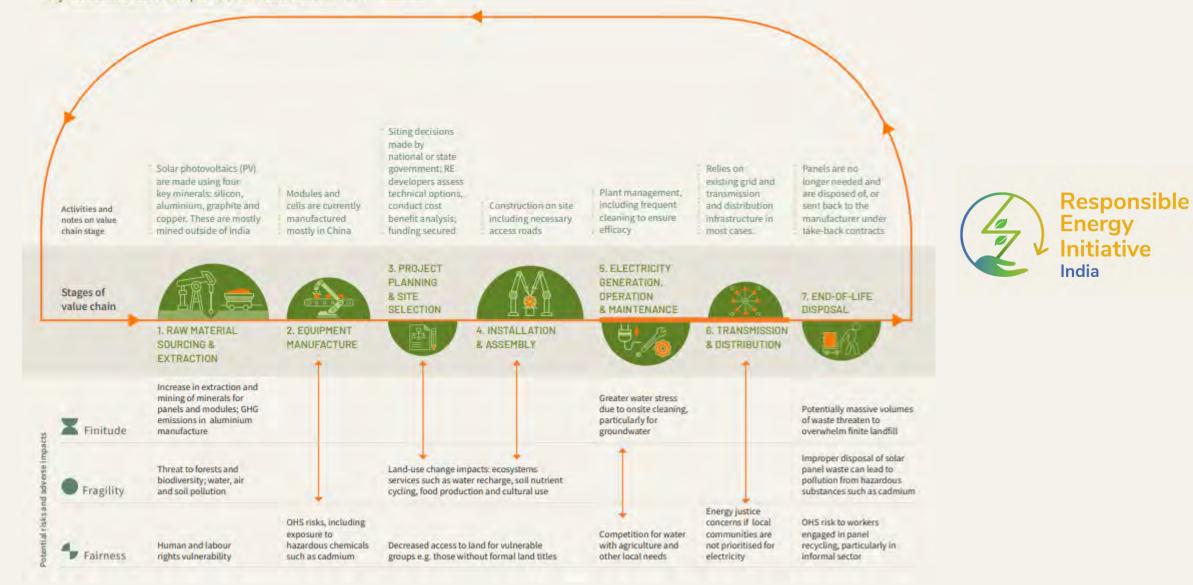
A spoonful of solar to help the medicine go down

Exploring synergies between health care and energy

Lanvin Concessao, Harsha Meenawat, Namrata Ginoya, Masfick Hazarika, Vandita Sahay. Dheeraj Kumar Gupta

PILLAR 4: ENERGY MINERALS, LAND AND CIRCULARITY

Key risks and adverse impacts in the solar value chain





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A MOMENT FOR RADICAL COLLABORATION





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MIT Earth Day Colloquium April 22, 2024