

2020 - 2030 A DECADE FOR ACTION

A part of



أسبوع أبوظبي للاستدامة
ABU DHABI
SUSTAINABILITY WEEK

Hosted by



Masdar مصدر
A MUBADALA COMPANY إحدى شركات مبادلة

ADSW Principal Partner

دائرة الطاقة
DEPARTMENT OF ENERGY



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Foreword

Mohamed Jameel Al Ramahi

Chief Executive Officer, Masdar

When the history of the 21st century is written, 2020 will surely earn its own chapter for the pandemic alone. But the story of 2020 is also one about our climate: 2020 was one of the hottest years on record, and if we look beyond the COVID-19 coverage, we see headlines and news reports detailing a record-breaking hurricane season, devastating wildfires and deadly heatwaves.

But it may also be remembered as marking the beginning of a decade of real change on the environment. I sincerely hope that Abu Dhabi Sustainability Week (ADSW), held in the first days of 2021, will be recognized as the platform where the world's most influential experts and leaders in sustainability and climate action put in place a working roadmap for the so-called 'green recovery', the massive investment in sustainable infrastructure first mooted last year as the true scale of the economic impact of the pandemic began to be felt.

The potential dividend to our planet from this green recovery cannot be understated. The International Renewable Energy Agency (IRENA), which is headquartered in Masdar City, estimates that average annual investments of US\$2 trillion in renewables and sustainable technologies in the 2021-2023 post-COVID recovery phase could create 5.5 million additional jobs – while an extra 19 million jobs could be created by 2030, if we scale up investment in the energy transition.

And, as governments around the world begin to devise and implement these massive stimulus packages to rebuild their economies, there is already a demand that these responses be aligned with the United Nations Sustainable Development Goals (SDG). Set out in the United Nations 2020 Agenda and adopted by governments around the world in the Paris Agreement are intended to be the blueprint for a more sustainable future for all – addressing not only climate change and environmental degradation but also long-term health and well-being, prosperity, inequality, gender parity, and more.

If we are to keep global warming to under 1.5 degrees C this century, then adhering to the SDGs must be made a priority, and the green recovery has given us a once-in-a-lifetime opportunity to align local, national and global environmental policies with these important goals,

A global green recovery is not yet a done deal, however. With the pandemic set to trigger the worst recession of our lifetimes, I am concerned that cash-poor nations may yet 'double down' on coal and fossil fuels due to short-term economic concerns.

There is good news: there is no shortage of private capital for renewable or sustainable projects. On the contrary there is a global shift of capital towards renewable energy where clean energy technologies such as solar and wind are well understood and are cost competitive.

However, the challenge for emerging markets is capturing their share of that capital as they are typically seen as higher risk for investment, especially if blue-chip economies such as the US – which has pledged to invest \$2 trillion in green infrastructure over just four years under the Build Back Better initiative – offer easier, less risky returns. To make the green recovery truly global, we will need more co-operation between the public and private sectors and international institutions to ensure the economic and social benefits of infrastructure development are shared equally.

Today, we stand at a pivotal moment as we look to reboot economies, accelerate clean energy transitions and move toward a more sustainable future – all made more pressing due to COVID-19. In the UAE, we are particularly excited about our future collaborations with energy innovators in the US, Europe and, from this year, Israel, a welcome development made possible by the historic Abraham Accords signed in August 2020. At Masdar, we look to a new era of international co-operation, with our company uniquely placed to invest in key technologies in developed nations and help apply them in established and emerging markets the world over.

As we look forward to 2021 and turning a corner, it is important to remember the optimism we all felt at the beginning of 2020. Abu Dhabi Sustainability Week 2020 took place weeks before we had even heard of COVID-19, at a time when hopes were high of real concerted action and a unified global approach to climate change. The ideas debated and the pledges and promises made during the 2020 event are as relevant now as they were then, we hope that this report, highlighting the key themes we discussed, will provide inspiration as we begin our green recovery.



About

Abu Dhabi Sustainability Week

Abu Dhabi Sustainability Week (ADSW) is a global platform for accelerating the world's sustainable development. The week brings together a unique fusion of policy makers, industry specialists, technology pioneers and the next generation of sustainability leaders to engage in dialogue and take action to advance the global sustainability agenda. Through its initiatives and events, ADSW is a catalyst for sharing knowledge, implementing strategies and delivering solutions to drive human progress. ADSW is committed to furthering our understanding of the major social, economic and environmental trends shaping the world's sustainable development.

- H.E. Eng. Awaidha Murshed Al Marar
Chairman, Department of Energy, Member of the Executive Council, Abu Dhabi



2020 in Review

The COVID-19 crisis, and the disruption it has caused has been the major story of 2020. From industry shutdowns to job losses and from wearing masks to adapting to virtual socializing, there has been a huge physical and social shift that has led to a drastic change in the way we live, work, move and consume. One of the major results has been a renewed focus on climate change, and pronounced calls for a green recovery as a result of the pandemic.

Economic crisis

The pandemic has plunged most countries into recession in 2020 with some seeing their largest drop in per capita income in 100 years. Few countries are expected to escape the downturn, with advanced economies projected to shrink 7 percent, and emerging markets and developing economies forecasted to contract by 2.5 percent.

Travel and global tourism have been one of the industries most affected. Unprecedented travel restrictions put in place by many countries at the beginning of the pandemic have remained and this has had a huge impact on tourism. The United Nations World Tourism Organization expects that international tourism will be down 20% to 30% in 2020, when compared to 2019. The airline industry is set to incur a \$118 billion net loss in 2020. Some global air travel demand has increased in recent months but is still depressed and airlines have indicated large-scale layoffs to stay solvent.

Other sectors have had to go through periods of mass disruption as consumer behavior dramatically shifted. One example is the increase in online shopping in developed countries. In the United States, the increase in e-commerce penetration observed in the first half of 2020 was equivalent to that of the last decade. In Europe, overall digital adoption has jumped to 95 percent from 81 percent.



Green Recovery

Many governments are using the pandemic as an opportunity to shift greater momentum towards a clean energy future by including renewable energy and infrastructure as part of their post-COVID economic recoveries. For example:

- At the Global Green Growth Institute meeting in October 2020, the UAE said that its COVID-19 recovery plan aims to drive sustainable development by encouraging investment in the digital economy, food security, and the green economy. During the pandemic, the UAE has launched the first phase of a 5.6 GW Barakah Nuclear Energy Plan, bid for a new 2 GW solar photovoltaic project, and constructed the world's tallest solar power tower in Dubai. The UAE has also appointed HE Dr Sultan Ahmed Al Jaber, the country's Minister of Industry and Advanced Technology as special envoy for climate change.
- US President-elect Joe Biden's economic recovery plan, called Build Back Better, plans to spend over US\$7.3 trillion and invest in green infrastructure. The plan includes zero-emissions public transportation in cities with over 100,000 people, a carbon pollution-free power sector by 2035, construction of 1.5 million sustainable homes and housing units, jobs in climate-smart agriculture, resilience, and conservation, while working to achieve environmental justice. President-elect Joe Biden has also made re-joining the Paris Agreement a central part of his election campaign platform. The focus that climate change will be given under the new President-elect was signalled by the creation of new Cabinet-level post of climate envoy who also sits on the National Security Council.
- At the 75th UN General Assembly in September, Chinese President Xi Jinping called on all countries to achieve a green recovery of the world economy. He pledged to fulfill China's net zero goal by 2060. In December, at the virtual Climate Ambition Summit, he set several specific goals for 2030, including: reducing carbon emissions per unit of GDP by 65 percent from the 2005 level, increase the share of non-fossil-fuel resources to about 25 percent, increase forest space by 6 billion cubic meters, and generate 1.2 billion kilowatts of solar and wind energy.
- The UK recently unveiled its strategy to cut UK carbon emissions by 230 million metric tonnes over the next decade, the equivalent to permanently removing 7.5 million petrol cars from the roads. The UK's 10-Point Plan for a Green Industrial Revolution will support 220,000 new green jobs over the next 10 years, and signals a decisive and permanent shift away from their dependence on fossil fuels.
- In France, one third of President Emmanuel Macron's EUR 100 billion stimulus package, which amounts to 4 percent of the GDP, is allocated to green measures. These investments include spending for the transport sector, energy-efficiency improvements for public buildings, decarbonization measures like the development of green hydrogen technologies, and greening the food sector.
- Under an "investment program for the future," Germany is investing grants of 50 billion euros into sustainable mobility, energy transition, digitalization, public health, and research and education projects. Mobility and energy transition funds are closely aligned with Germany's Climate Action Package 2030, and helps Germany pursue its journey towards a carbon natural society by 2050.
- Colombia's stimulus and recovery plan, called Compromiso por el Futuro de Colombia, includes investments over COP 100 billion (about EUR 22 million) and the creation of 1 million jobs. The plan's "roadmap for sustainable growth" focuses on topics such as energy transition, combatting the effects of climate change, more reforestation and less deforestation, and access to environmental information. The government is planning to foster the country's clean energy transition with the aim of making Colombia the regional leader in this field. It will spend COP 16 billion (EUR 3.5 million) to accelerate 27 renewable energy and transmission projects, hoping to create about 55,000 jobs.

In 2020, the shutdown of travel and other activities is estimated to have resulted in a reduction in emissions of between 4.2 and 7.5 percent. However, this has had little impact on the continued rise in atmospheric concentrations of CO₂.

Levels of carbon dioxide (CO₂) in the atmosphere hit a new record of 410.5 parts per million in 2019, and are expected to keep rising this year, the World Meteorological Organization (WMO) said in its annual Greenhouse Gas Bulletin. The UN estimates COVID lockdowns may only lower 2050 temperatures by 0.01C.

The urgency around energy transition is also presenting an opportunity for oil producers to diversify their business. For example, earlier this year, BP announced its ambition to be a net zero company by 2050 or sooner. This covers the greenhouse gas emissions from its operations worldwide, and the carbon in the oil and gas it produces.

Renewable power has grown at a record pace during 2020. Ninety percent of new power additions to the global grid this year will be renewable energy, compared to gas and coal contributing just 10 percent.

According to S&P Global Platts Future Energy Outlooks, more than 10 times the emission reductions resulting from COVID-19 will be needed to meet the two-degree target through 2050. A mix of solutions that goes beyond increasing renewables. Hydrogen, carbon, capture utilization and storage, and biofuels will all likely play roles in transforming and decarbonizing the interconnected global energy system.



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“We see a significant growth in electricity demand, actually doubling from today until 2050.”

- Christer Tryggestad

Senior Partner, Global Electric Power and Natural Gas and Oil and Gas Practices, McKinsey



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The world is progressing in a way that will fundamentally reshape how we consume and produce energy, and the responsible path to long-term prosperity lies in transforming our economies to capture new opportunities in energy and beyond.”

- H.E. Josaia Voreqe Bainimarama
Prime Minister, Republic of Fiji



Energy Transition

Renewable energy currently makes up around 25 percent of the world's energy. Renewables are set to account for 95 percent of the net increase in global power capacity through 2025. Energy systems around the world are going through rapid transitions that will bring important changes to the way we fuel our cars, heat our homes, and power our industries.

These trends will have widespread implications for businesses, governments, and individuals in the coming decades. Christer Tryggestad, Senior Partner at McKinsey, highlights a key trend around electrification where “we see a significant growth in electricity demand, actually doubling from today until 2050.” Electricity consumption is expected to double by 2050, growing seven times as fast as other fuels, mainly driven by electrification of transportation and building sectors.



Money is circulating in capital-rich countries when actually energy demand is growing in capital-poor countries, that's really the problem we are trying to solve."

- Dr. Arunabha Ghosh
Chief Executive Officer,
Council on Energy,
Environment and Water



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Renewables in the Global South

The renewable energy industry has matured in the past five years. The cost of producing renewables has decreased substantially, largely due to advances in renewable energy technologies. Renewables are on course to become the most cost-effective source of energy.

Doubling the share of renewables globally could increase global GDP by as much as US\$1.3 trillion. The renewables market is highly dynamic, with growth centred in the Global South in countries like India and China. Additionally, renewable energy projects are poised to end energy poverty in sub-Saharan Africa and South Asia.

Unfortunately, the growth in energy is spread unequally. In 2019, 15 percent of the world's population received 40 percent of the world's energy investment, while another 40 percent of the world's population only received 15 percent. New development paths have been created, aimed at balancing the delivery of economic gains to people in need with progress towards a zero-carbon future. In 2018, renewable energy investment in developing countries – excluding China and India – jumped 17 percent to a record US\$59.5 billion.

Worldwide, however, more than 1.1 billion people remain without access to electricity. If not addressed, this lack of power will prevent these regions from making critical social, economic, and technological advancements. Therefore, this untapped market is a huge opportunity for renewables.

Some experts believe the next big renewable market is distributing energy in densely populated urban areas within developing countries. In India alone, this represents a 40,000-megawatt opportunity, which is only met at 10 percent today. Banks are investing huge sums of money in renewables, and these investments are increasingly focused on emerging markets.



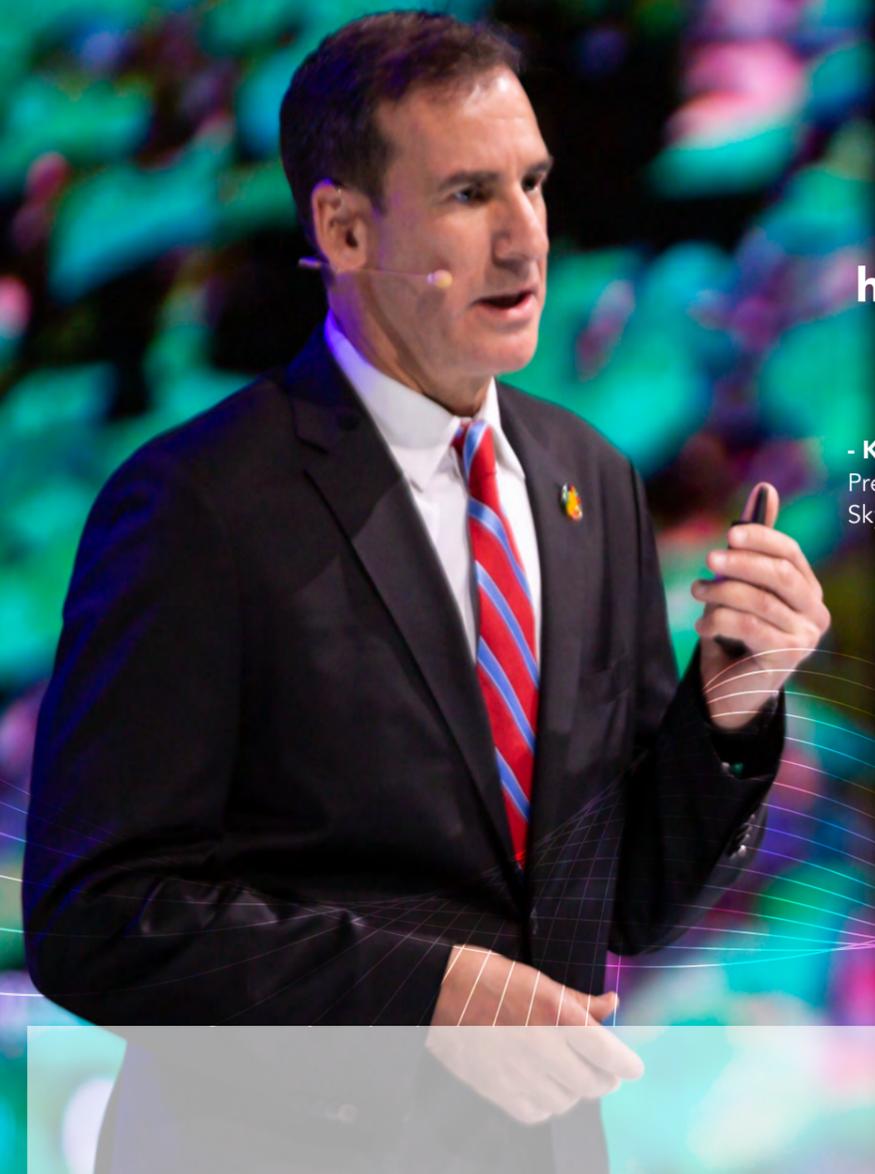
My advice to other leaders, especially in Africa, is to harness the power of technology, science, and innovation so we can catch up with the rest of the world."

- H.E. Julius Maada Bio
President, Republic of Sierra Leone



Power is almost like a drug; once you have it, you can't live without it".

- Kerry Adler
President and Chief Executive Officer,
SkyPower



Opportunities in Africa

Africa has the youngest population in the world, and by 2050 a quarter of the world's population will live there. This presents major opportunities to advance Africa's access to renewable energy supply.

Energy access in Sierra Leone, for example, is alarmingly low at 17 percent, which provides a huge opportunity for those who want to invest. The country currently holds a major hydro-power source and there are many more viable options for alternate energy. Sierra Leone recently established one of the largest off-grid solar energy projects, sustaining 54 communities, and more is under development.

Access to renewable energy can help build new industries. Cotton production in Mali, for example, is one of the highest in Africa. Only 2 percent of this cotton is processed domestically, however, which means Mali needs to import all textiles. Processing the cotton locally would enrich the economy and create jobs for young people, but they need a reliable source of power to run the plants. Renewable energy would provide the necessary amount of power while limiting the negative environmental impact.

Smart Grids and Renewable Storage: Energy Tech for Good

As the demand for renewable energy has skyrocketed and power generation from household windmills and solar panels has flourished, the existing "one-way" power grid model is rapidly becoming out of date. The development of Smart Grids, which dynamically distribute energy from multiple sources throughout the network, is the new frontier for utilities across both developed and developing economies.

Smart Grids drive efficiencies helping countries reach climate reduction targets by wasting less power. "My personal perception is that energy efficiency is one of the great

solutions for climate change, but it is vastly, vastly underutilized, which I can't understand, because unlike some of the other decarbonization solutions, energy efficiency saves money for corporations" says Michael Hayes, the Global Head of Renewables for KPMG.

To avoid blackouts and loss of power, we require a consistent source of power. Wind and solar power are intermittent because they depend on the amount of wind and sunlight available. To overcome this variability issue, technological advancements in artificial intelligence, machine learning, and the Internet of Things (IoT) are revolutionizing energy distribution.



Solar energy is an extremely powerful weapon to deal with climate issues and promote sustainable development."

- Li Zhenguo
President, LONGi Solar

Future Sustainability Summit

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No woman should die giving life... Every health center is entitled to reliable electricity. Clean renewable energy is the appropriate and immediate solution to this global challenge."

- Dr. Laura Stachel
co-founder of We Care Solar



Solar: A Key Technology

Although wind energy will remain most useful for powering cities, rural communities will find that solar energy is much more efficient, cheaper, and easier to install. Dietmar Siersdorfer, the Chief Executive Officer of Siemens Energy Middle East, predicts that "most of the investment we will see in the next three decades will go into renewables; wind and solar will play the biggest role."

Abundant, clean, and cheap, solar is the key to sustainable development. Entire industries can be transformed if factories are supplied with enough solar energy and operate with zero carbon emissions.

Solar energy's relatively balanced distribution allows it to be used locally, without causing pollution, or having an impact on our ecological balance. With the continuous advancement of technology and energy storage, solar energy is poised to become the most economical energy source within the next two to three years.

Zhenguo firmly believes that "with effective use of solar energy and energy storage, we can reach negative carbon emission and solve the climate issue." Factories can run on solar panels during the day and storage systems at night. Large-scale solar power stations, once built, will be able to supply electricity to cities and the surplus power can be used for seawater desalination.

Solar: Saving Lives Case Study

In sub-Saharan Africa, 1 in 38 women face a risk of dying in childbirth. Aid workers looking into this issue discovered that a reason for the high mortality rate was that hospitals go without electricity for 12 hours a day. This meant that C-sections were conducted by the ambient light of windows, surgical equipment which relied on electricity was no longer used, refrigeration was not used when storing blood, and communication between emergency teams was greatly slowed down

The Solar Suitcase, which is a solar electric system the size of a suitcase for use in medical clinics in the developing world, provides

12VDC power. Solar Suitcases have reached more than 400 health facilities in 20 countries and served more than 3.9 million mothers and new-borns. The technology has already contributed to a significant drop in maternal and new-born mortality and an increase of women using health facilities for childbirth. The solar suitcase was even used where disasters, such as tsunamis or earthquakes, have occurred such in recent years. We Care Solar is a recipient of the Zayed Sustainability Prize.

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Businesses are there to provide the solutions, but policymakers have to be willing to take it.”

- David Papazian
Chief Executive Officer,
Armenian National Interests Fund

PAPAZIAN

Policy vs Innovation

Governments with overly strict energy regulations may end up inhibiting the adoption of renewable technologies as companies innovate at rapid pace, and regulatory systems struggle to keep up. The renewable energy sector asks governments to implement laws and regulations that cover the risks involved in implementing new technology while allowing companies to compete most effectively. As Dr. Manar Al Moneef, President and Chief Executive Officer, Middle East, North Africa and Turkey, for GE Renewable Energy, puts it: “How can we create that comfort for the regulators? To make sure that they create regulations that will allow people to be more competitive, adhere to the requirement, but be open to technology? That’s the mind-set that we need to move with.”

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As a nation, we recognize that the challenges of sustainability that we face cannot be confined within our borders but must focus on international dialogue and cooperation.”

- H.E. Sheikh Nahayan bin
Mabarak Al Nahayan
Cabinet Member and Minister of
Tolerance, UAE

The Gulf Playing a Role

There will continue to be a number of opportunities for the Middle East to continue its global leadership role in the energy sector. Rachid Majiti, McKinsey Senior Partner based in the UAE says, "The Middle East has a tremendous renewable opportunity. We have lots of sunshine in the Middle East. We have seen the solar and wind potential starting to translate in very attractive power prices or costs for our production."

The UAE's 2050 Energy Strategy now aims at deriving 50 percent of its energy from renewable resources by 2050 and securing an energy mix that includes renewables, as well as nuclear energy. With its new energy mix, the UAE aims to save 190 billion dollars while also reducing emissions. The plan is to be halfway to that goal within the next two years.

"Today we have the capacity to capture and sequester over 800,000 tons of CO₂. And again, earlier this week, we announced our plans to expand that capacity to five million tons, which will solidify our position as a world leader in CO₂ capture," Alan E. Nelson, Chief Technology Officer, Abu Dhabi's National Oil Company (ADNOC).

Abu Dhabi hosts close to 80 percent of the installed solar energy capacity in the Gulf Cooperation Council. Abu Dhabi is also home to one of the world's largest individual solar power plants, called Noor Abu Dhabi. The plant produces 1.17 gigawatts of power, which is enough to supply the needs of over 90,000 people and reduce their yearly carbon emissions by 1 million metric tons. The output of this plant is the equivalent of taking 200,000 cars off the roads. Dubai is in the process of launching the largest single-site solar park in the world, with a planned capacity of 5,000MW by 2030.

Rachid Majiti, McKinsey Senior Partner based in UAE, believes that the Middle East could become a leader in renewable energy: "The Middle East has been historically leading the world in hydrocarbons, with affordable and cheap energy for its population. It has an opportunity with renewable energy to continue that. But it also means that if you are really growing at scale, in terms of solar and wind deployment, there might be new opportunities for equipment and services that need to take place, to make the renewable potential materialize."

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As an oil producer and a gas producer, we want to have a world that gives an equal playing field for all sources of energies.”

- H.R.H. Prince Abdulaziz bin Salman Al-Saud
Minister of Energy,
Kingdom of Saudi Arabia

Future Sustainability Summit

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We are targeting a reduction of the emissions by 70 percent.”

- H.E. Suhail bin Mohammed Faraj Faris Al Mazrouei
Minister of Energy and Infrastructure,
UAE

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10 years ago, even five years ago, we couldn't do what we're doing right now with AI technology, autonomous technology, or robotic engineering.”

- Harj Dhaliwal
Managing Director
of Virgin Hyperloop One



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We are the generation of technology. We should use it in our favour to change the world.”

- Anna Luisa Beserra
Young Champion of the Earth,
United Nations Environment Programme



Tech and Skills for Sustainability

We are in a period of technological transformation. “10 years ago, even five years ago, we couldn't do what we're doing right now with AI technology, autonomous technology, or robotic engineering,” says Harj Dhaliwal, the Managing Director of Virgin Hyperloop One, which is the only company in the world that has successfully tested hyperloop technology.

Our environment has often paid the price of rapid technological expansion, but consumers are increasingly pressuring technology companies to make responsible and sustainable investment decisions. Technological advancements do not have to come with environmental costs and creating the next wave of skills will also be fundamental to achieving global sustainable development goals.



We have to reinvent the way we educate children by making sure that education is much more precise, quicker, and maybe shorter in time. You don't go to school to know where Paraguay is and what's the capital of Paraguay because you can find out on Google."

- H.E. Dr. Armen Sarkissian
President, Republic of Armenia



Basically, sustainability, earth observation, and all the scientific research that scholars do at the international level is enabled thanks to all the information that we collect from satellites."

- Laurence Monnoyer-Smith
Environment and Climate Advisor to the President, Centre National d'Etudes Spatiales (CNES)

Educating Future Workforces

Education plays a major role in propelling climate action. Fighting climate change requires a global shift in thinking and decision-making, and education has a key role to play in this shift. Speaking about climate change, the deputy Prime Minister of Slovenia, Dr. Miro Cerar said, "It is my deep conviction that each government today, and each policymaker has to be oriented towards education."

Future generations will live in a different and much more volatile environment. They need to immediately understand and be ready to address the impacts of climate change. Education can empower them to take appropriate actions. Governments and policymakers must now focus their efforts on

integrating the issue of climate change into education.

Jobs, skills, and responsibilities will increasingly need to meet the needs of a sustainable future. Incorporating new technologies and adaptive learning in educational systems will increase the chances for our children to adapt to an ever-evolving career path.

New technologies create economic disruptions, but they can also be the tools to overcome this disruption to create a better world. Incorporating new technologies and adaptive learning in educational systems will increase the chances for children to adapt to an ever-evolving career path.

Satellites for Climate Action

Space exploration can contribute greatly to advancing sustainability goals on Earth.

Satellite data, linked with local empirical data, can help model coastal erosion, water supply, and more. Arab countries, led by the UAE, will launch the Arab Satellite 813 in two years. The satellite will use cutting-edge space technologies to monitor desertification, drought, and greenhouse emissions for the whole Arab region.

Much research about climate change and the environment relies on data collected from space. This data helps us understand ecosystems, water cycles, and carbon cycles, all of which are necessary to model and

understand the changing climate. Satellite technology can now use magnetic resonance and frequency to identify whether water is potable, saline, or brackish anywhere in the world, thus offering the opportunity to provide water to people in countries that really need it. Similar data is also used in disaster and crisis management.



It's no longer going to be good enough for transportation to be separate from energy. Transportation departments have to learn to talk to energy departments and realize how the two sectors are coming together."

- Peter Harris
International Sustainability Director, UPS



I passionately believe that the future of our industry, the future opportunities that we have to teach our children and our children's children about the value of travel comes when you embrace sustainable tourism."

- Jeremy Jauncey
Founder & CEO, Beautiful Destinations,
WWF Ambassador, USA



The Transportation Revolution

Pre-COVID-19, transport accounted for 14 percent of global greenhouse gas emissions, with cars driving the majority of this pollution. Heavy rail transit, such as subways and metros, produce on average 75 percent lower greenhouse gas emissions per passenger mile than an average single occupancy vehicle. Light rail systems produce 62 percent less emissions, and bus transit produces 33% less emissions. In the future, emerging technologies such as electric vehicles (EVs), autonomous driving, and ridesharing will acquire greater prominence as we look to achieve even cleaner transport systems.

According to a McKinsey report, EV sales in 2019 set another sales record globally, and EVs became much more prominent in the public awareness in major automotive markets, such as Europe. Some players demonstrated truly driverless cars without backup drivers, setting new milestones in autonomous driving. Uber and Lyft, the two big disruptors in the ride-hailing space, went public in spring 2019.

Also, in 2019, regulators began granting approval to drone deliveries and electric vertical takeoff and landing crafts, with these types of vehicles flying for the first time. However, the report predicts that the road ahead remains bumpy, as today's reality delivers a mixed picture for the future of mobility. On the one hand, there are big expectations with regard to future technologies and business models; on the other hand, there is an urgent need for a 'double transformation.' In other words, preparing companies for the mobility of tomorrow also means making today's business crisis resistant.

Measuring Individual Carbon Footprints

Global travel, although hit by COVID-19, is expected to return in 2021. This will be welcomed since one in ten jobs in the world come from the travel and tourism industry. However, tourism accounts for roughly 5 percent of all greenhouse gas (GHG) emissions.

The simplest and easiest way for travellers to be more aware of their own impact is by using a credible carbon calculator to determine their actual carbon footprint. A carbon credit calculator takes three main lifestyle considerations and produces a carbon credit score: the transportation modes used in day-to-day life, consumption of goods and services, and the consumption of energy. Individuals can take accountability of their carbon footprints and act by buying carbon credits to make up for the emissions they produce.

Electric powered aircraft already exist on a small scale and sustained efforts are being made to increase their numbers. Ultimately, if air travel is to become greener and reduce carbon emissions, there needs to be a combined effort from governments, civil aviation authorities, and airlines to work together to find collective solutions. One way is to reorganize flight paths so that they become shorter, reduce the amount of fuel burnt, and lower CO2 emissions.

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With innovation, education, cooperation, we can achieve a food secure world. But... we must ensure that it's universally achieved."

- Ambassador Ertharin Cousin

Distinguished Fellow, Stanford University,
Former Executive Director, United Nations
World Food Programme, USA



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Food and Water

If you don't have food security in the world, I believe you don't have any security at all."

- Thomas H. Rudy

Managing Partner of Elevate Innovation



Food and Water

Food security means having access to sufficient, safe, nutritious, and affordable food at all times, even in emergencies and crises. It has become a global issue, and as COVID-19 reminded us, even in wealthy nations, it is likely to be magnified in future years due to population growth, climate change, water depletion, and food loss and waste.

With desertification increasing throughout the world, the UAE national food security strategy is a model for agriculture in low water environments. When the UAE began their national food security strategy, they started by analyzing the foods that the country consumes, the ones that it makes sense to grow in the country, and the foods that it imports. The UAE then offered multiple funding initiatives, all aimed at encouraging innovation to find solutions for the pressing issue of food security, through public-private partnerships. Abu Dhabi invested AED 1 billion to incentivize aggrotech companies, Emirates Airlines created a joint venture to build the largest vertical farm in the country, and His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, personally provided AED 5.6 billion in research and development for food and water scarcity.



The school of thought in environmental science today is divided. One side says: 'We have to change our values if you want to save the planet'. The other side says: 'Don't worry about the values. Keep consuming, technology will address all these things'."

- Srdjan Susic

Director, Conservation and Climate Change, Emirates Nature-WWF, UAE



We are heading towards a global population of 9 billion and traditional agriculture can't keep up. We have a food gap that is growing year by year."

- H.E. Mariam bint Mohammed Saeed

Hareb Almheiri

Minister of State for Food Security, UAE



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Reducing Water Waste

Water scarcity has been defined by the World Economic Forum as the number one risk factor for the coming decade. 1.8 billion people will not have access to safe water by 2025. However, poor water usage is arguably a bigger issue than water scarcity. In developing countries, roughly 45 million cubic meters of water are lost daily with an economic value of over US\$3 billion per year.

Data solutions and new technologies can help alleviate water issues. High-resolution multispectral imagery can help farmers increase their yields and maximize their sustainability. Soil moisture sensors can help farmers understand how much water they need to use. Aerial imaging analytics can help show farmers whether they are under-watering or over-watering, and detect irrigation or soil issues.

Work is needed both from governments and innovators to help create and promote technologies to solve water issues. RanMarine Technology, for example, has developed a drone that they say can extract unwanted material from water, including trash, plastic, micro-plastic, oil, toxic algae, and invasive plants. While, another company, Desert Control, offers an organic, liquid solution that they say can reduce water needs in agriculture by up to 50 percent.

Beyond the existence of these technologies, their adoption remains a challenge. Governments and regulators will need to create incentives in order to accelerate and spur the uptake of solutions in the water sector.

Reducing Food Waste

Almost a third of food is wasted or lost every year. Half of this food waste occurs before it even reaches the consumer's table. More efficient production systems will help to reduce this. Solving food waste requires more than new technologies. It requires changing behavior. Kyle Wagner, the Head of Operations for Madar Farms, says, "we do believe a key part of the equation for change is changing mind sets."

Emirates Flight Catering recently partnered with technology provider Winnow in a new commitment to reduce food wastage across its Dubai operations by over a third. The group provides in-flight catering to over 100 airlines at Dubai International Airport and will now use Winnow's Artificial Intelligence technology to reduce wastage by 35 percent. The Winnow Vision AI technology uses intelligent cameras, smart scales, and meters to analyze ingredients used during food preparation, to assess which food items are most wasted and in what quantities.



We can't let perfection be the enemy of progress... Sensible reduction, recyclability, new business models, bio-plastics are all areas we need to work together in order to move towards a circular economy.

- Sarah Marshall

Director of Sustainability for NOVA Chemicals



- Kilaparti Ramakrishna

Head of Strategy and Planning, Green Climate Fund

Moving Towards the Circular Economy

After World War Two, linear economic models helped to boost economies by creating more products. Today, we must acknowledge that we are living in a world of finite resources, and we must find new ways to design products and change business models to become more circular. This is not about producing more, it is about reusing the products we already have.

A circular economy is an alternative to a traditional linear economy in which we keep resources in use for as long as possible, extract the maximum value from them while they are in use, then recover and regenerate products and materials at the end of each service life. However, adapting to a circular economy is challenging for both consumers and companies. Consumers do not always have access to sustainable products that are also affordable. Also, companies are lacking the needed data to invest in the research and development to invest in products that are more sustainable, in a way that is more price efficient.



Can Plastics Enter the Circular Economy?

Each year, 11 million tonnes of plastic waste end up in our oceans. The plastic industry set a goal of raising US\$1.5 billion dollars to create infrastructure solutions that stop plastic waste from entering the environment.

Oliver Cunningham, Non-Executive Director of RanMarine Technology, a technology product company, offered the following statistic about population growth: "By the time we hit that ten billion mark, we are probably going to be 75 percent urbanized. So, that means that cities are going to be the great consumers... and the great producers of waste."

Companies are held accountable by their customers and are starting to assume responsibility for the environmental output caused throughout each stage of their supply chains. NOVA Chemicals, a plastics and chemical company, is working towards their goal to make all plastic packaging 100 percent recyclable by 2040. Their Director of Sustainability, Sarah Marshall, said: "We can't let perfection be the enemy of progress... sensible reduction, recyclability, new business models, bio-plastics are all areas we need to work together into move towards a circular economy." Avi Garbow, the Environmental Advocate for Patagonia, says that companies "must expand our sense of responsibility to each and every stage in our value and supply chains." To achieve this there is a need for the concept of reusing and recycling to be made attractive to people across the value chain.

Change Starts Young

"Generation Z [is] very concerned and aware of sustainability and treat it almost like a solidarity movement," says Tamara Hostal, Founder and Chief Executive Officer of ESMOD French Fashion Institute.

Leading social impact projects and engaging their purchasing power are two efficient methods young people can use to bring change. For example, young people can pressure companies, or work with them, to advance the global sustainability agenda. In Brazil, there is an emerging culture of young leadership, with young people pushing businesses to make change. As consumers, young people demand that companies make more sustainable decisions, but young people can also collaborate more with companies to advance their own environmental projects, through grants, partnerships, intrapreneurship (the act of behaving like an entrepreneur while working within a large organization) and extrapreneurship (the concept of thinking like an entrepreneur while working as part of a company).



Moving Towards the Circular Economy

Future Sustainability Summit

- Sustainable Fashion Show



Sustainable Fashion

Since 2000, clothing companies have doubled the number of their products. Luxury brands previously produced two to three collections per year. They now produce up to 10. One garbage truck full of clothes is burned every second. "How sustainable is clothing if it's environmentally friendly but we're producing 100 billion garments a year? We must start thinking about how to reduce landfills," says Craig Jacobs, the Founder and Creative Director of Fundudzi, an ethical fashion brand.

The fashion industry is now responsible for 10 percent of all carbon emissions. According to the United Nations Environment Program (UNEP) this is more than the carbon produced by international flights and maritime shipping combined. There is an urgent need for brands and designers to integrate sustainability within their entire value chain.

Design curriculums need to be transformed so designers understand the role of sustainable fashion. "If you don't get to the designer while they're in school, it's a bit too late" offers the Dean of Parsons School of Design, Burak Cakmak. For him, eliminating fur simply is not enough. Repurposing existing fashion is the next design frontier. Designers are experimenting with innovative ways to use existing, organic material and considering each garment's whole value chain – where the product came from and how it will end.



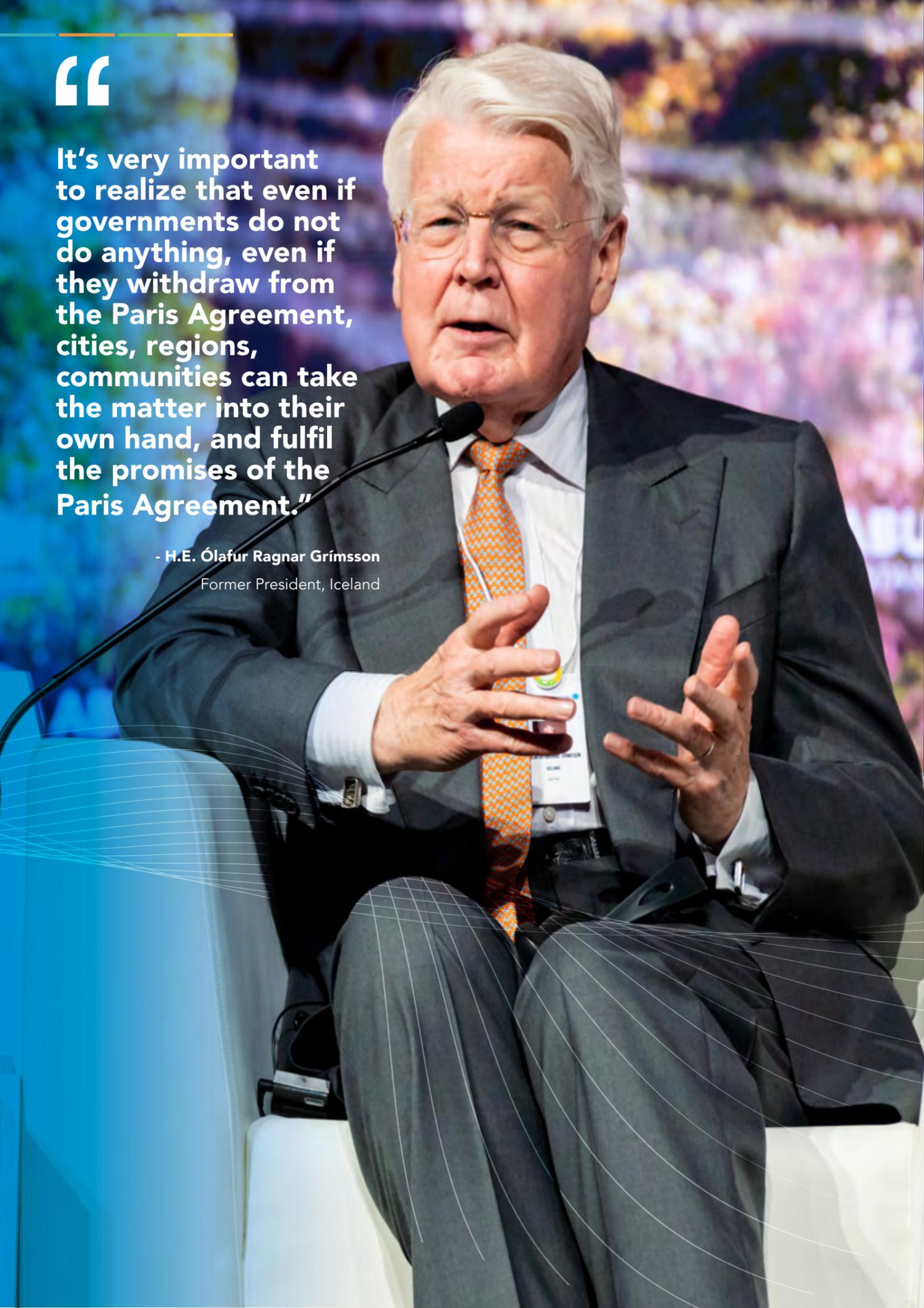
“When people think about pollution, they think about the aviation industry, the oil and gas industry. It's important to state that the fashion industry is the second-biggest polluter in the world.”

- Omar Itani
Young Champion of the Earth, United Nations Environment Programme

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It's very important to realize that even if governments do not do anything, even if they withdraw from the Paris Agreement, cities, regions, communities can take the matter into their own hand, and fulfil the promises of the Paris Agreement."

- H.E. Ólafur Ragnar Grímsson
Former President, Iceland



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Climate change and its severe adverse impacts are the most important global issues nowadays; it threatens the existence of the human race."

- H.E. Sheikh Hasina
Prime Minister, People's Republic of Bangladesh



Climate Chaos

The global cost for natural disasters from 2000 to 2009 has been estimated at US\$ 1.8 trillion. For the decade from 2010 to 2019, it has been estimated at close to US\$ 3 trillion.

Climate related storms and cyclones have a direct effect on the GDPs of coastal and Island nations. Coral bleaching and ocean acidification risk wiping out reef systems that feed thousands of people and enrich tourism sectors. The Prime Minister of the Republic of Fiji, H.E. Josaia Voreqe Bainimarama, warns that rising sea levels have already forced his administration to relocate dozens of seaside villages and invest in critical new infrastructure projects.

2020 has been marked as the start of a decade of action and is an important year for the Paris Agreement. However, governments are not the only actors who can impact the Paris Agreement goals. Given the comprehensive democratization of the energy sector, communities, companies, and individuals can all take action.

There's only one proven strategy to avert climate catastrophe and that is by urgently slashing emissions. 2021 is an important year for climate change with COP 26. Governments are not the only actors who can implement the Paris Agreement goals. Given the comprehensive democratization of the energy sector, villages, cities, and individuals can all play an important role.

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There is no doubt that global action on climate and sustainability are the most critical priorities of our time. As business, government, academia, and civil society, we need to honestly reflect on what more we can and must be doing to address the omnipresent risks of climate change.”

- H.E. Khaldoon Khalifa Al Mubarak
Managing Director and
Group Chief Executive Officer,
Mubadala Investment Company

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Policymakers have to be very ambitious when it comes to climate change, environmental goals, and of course our future.”

- H.E. Dr. Miro Cerar
Former Prime Minister and
Minister of the Foreign Affairs, Slovenia

“

In the midst of an existential climate crisis, innovative thinking will prove critical for the survival of our economies and our people.”

- H.E. Josaia Voreqe Bainimarama
Prime Minister of Fiji

Conclusion

No single technology, policy, or effort will deliver sustainability on its own.

Addressing the imminent threat of climate change, advancing the circular economy, and ensuring people live healthier more prosperous lives is going to require global action. It will require integration and cooperation on all fronts across all sectors, as policy, technological innovation and finance must be part of a holistic strategy that moves us towards systematic change.

The 17 UN Sustainable Development Goals (SDGs), if achieved, will have a transformational impact on our planet. Now is the time we must all unite in action against these goals. Harnessing the power of technology and the skills needed to thrive in a more sustainable world will be essential enablers to achieve our targets.

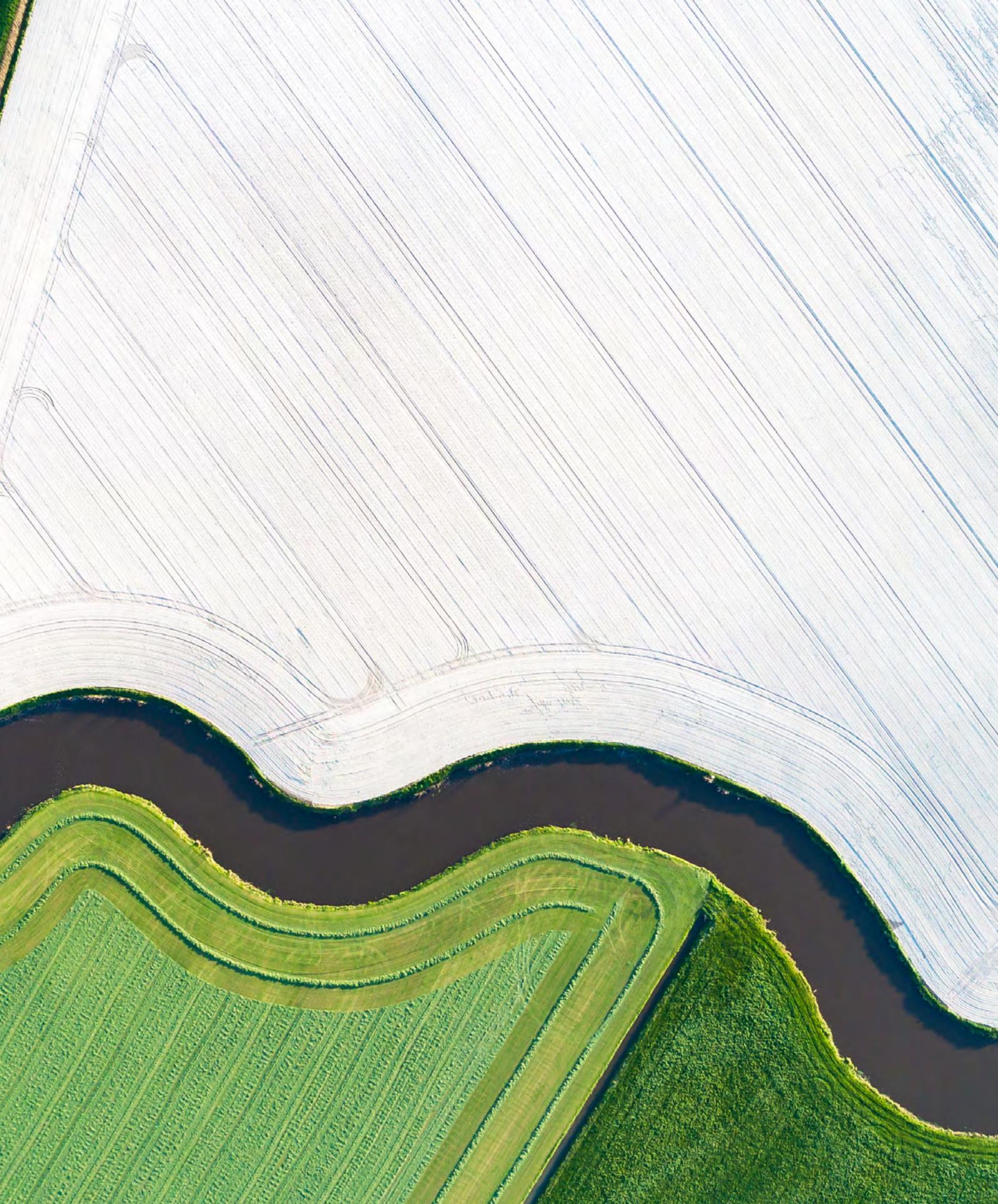
Next year will be key – decisions will be made that have a huge impact for the decade ahead and beyond. From how the world joins to ensure there is a global vaccination program that helps bring COVID-19 under control, to agreeing globally on greater alliances that work together to mitigate climate change.

At the start of November 2021, the UK, in partnership with Italy, will host the United Nations Framework Convention on Climate Change (UNFCCC)'s 26th Conference of Parties (COP26) in Glasgow. The conference builds on the COP21 where the Paris Climate Agreement was forged five years ago. The Paris Agreement requires all Parties to put forward their best efforts through "nationally determined contributions" and includes a mechanism to take stock every five years, encouraging nations to apply ever increasingly ambitious plans for addressing climate change.

Looking ahead to 2021, a green recovery agenda will be crucial to helping countries build back better. Results will include cleaner air quality, healthier water, effective waste management, and enhanced biodiversity protection, not to mention the potential to boost economic activity, generate income, create jobs, and reduce inequalities.

2020 has taught us that collaboration between countries, institutions, the private sector, and communities will need to be greater than ever, as we share our knowledge and expertise to ensure we align economic recovery with the priorities set by the UN's SDGs.

That is why events like ADSW, which bring together global sustainability leaders, are so important. Coming together to discuss the social, economic, and technological opportunities post-pandemic will help deliver solutions that drive human progress and a better future for us all.



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